MINISTRY OF HEALTH AND FAMILY WELFARE (MOHFW)

HEALTH AND GENDER SUPPORT PROJECT (HGSP)

ENVIRONMENTAL AND SOCIAL ASSESSMENT (ESA)

OCTOBER 2019

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ABBREVIATIONS

BNBC	Bangladesh National Building Code
BEmONC	Basic Emergency Obstetric and Newborn Care
CC	Community Clinic
CS	Civil Surgeon
CXB	CXB
DGHS	Director General of Health Services
DOE	Department of Environment
FDMN	Displaced FDMN Population
DSH	District Sadar Hospital
DTW	Deep Tube Well
DW	Drinking Water
ECR	Environment Conservation Rules
EHS	Environmental Health and Safety
ES	Environmental Specialist
EMP	Environmental Management Plan
ESCP	Environmental and Social Commitment Plan
ESA	Environmental and Social Assessment
ESMP	Environmental and Social Management Plan
ESF	Environmental and Social Framework
ESS	Environmental and Social Standards
ESMU	Environmental and Social Monitoring Unit
FDMN	Forcibly Displaced Myanmar Nationals
FD	Forest Department
FWC	Family Welfare Center
GBV	Gender Based Violence
GoB	Government of Bangladesh
GRM	Grievance Redress Mechanisms
GS	Gender Specialist
GW	Groundwater
HCF	Health Care Facility
HGSP	Health and Gender Support Project
HNP	Health, Nutrition and Population
HRMP	Human Resource Management Plan
HTW	Hand Tube Well
IA	Implementing Agency
IEC	Important Environmental Component
IEE	Initial Environmental Examination
IPP	Indigenous Peoples Procedure
ISO	International Organization for Standardization
MOEFCC	Ministry of Environment, Forest and Climate Change
MOL	Ministry of Land
MOWR	Ministry of Water Resources

MOHFW	Ministry of Health and Family Welfare
MOWCA	Ministry of Women and Children Affairs
MWM	Medical Waste Management
MWMG	Medical Waste Management Guideline
MWMP	Medical Waste Management Plan
MSLWM	Medical, Solid and Liquid Waste Management
OCC/Cell	One-Stop Crisis Center/Cell
PPE	Personal Protective Equipment
SC	Stakeholder Consultation
SDS	Social Development Specialist
SEA	Sexual Exploitation and Abuse
SEP	Stakeholder Engagement Plan
SWAp	Sector-Wide Approach
UzHC	Upazila Health Complex
UHFPO	Upazila Health and Family Planning Officer
WB	World Bank
WFS	Women Friendly Spaces
WHO	World Health Organization
WHS	Worker's Health and Safety
WMP	Waste Management Plan

EXECUTIVE SUMMARY

The influx of over one million Forcibly Displaced Myanmar Nationals (**FDMN**) since August 2017 has created an unprecedented pressure on basic services in Cox's Bazar (CXB) District where they have been given shelter in makeshift camps in Ukhia and Teknaf Upazilas of CXB (Basic information on CXB District/***Project Area*** at **Annex A**) The crisis resulted in widespread infectious diseases, food insecurity and poverty. Government's HNP services have stretched beyond limits since the demand for the same by FDMN is phenomenal and the management resources, personnel and attention have become inadequate to serve both the host population of CXB and the FDMN.

Further the need for adequate Gender-Based Violence (GBV) services has also increased, especially for the FDMN women and girls who have faced and witnessed extreme violence prior to fleeing their home state. Their psychological trauma and distress need immediate attention to ensure an expected standard of clinical and psychosocial healing. Besides, there are also widening gaps in the provision of services like clinical management of rape, lack of safe space for women and girls including age appropriate GBV services for adolescents. Therefore, CXB needs a well-coordinated GBV services and healthcare provision for both the host community and the FDMNs.

In light of the foregoing, the Project Development Objective (PDO) of the Health and Gender Support Project (HGSP) for CXB is to ***improve delivery and utilization of HNP and GBV response services in the host and FDMN of CXB district***. WBG grant financing of $150 million equivalent will support MOHFW to undertake the following components:

1) Establishing and scaling up the integrated provision of HNP and GBV response services in all tiers of care (district and below) – ***95 million US$***. This component will support strengthening of HNP and GBV response services along with the provision of the requisite infrastructure (*reparation, renovation, refurbishment of existing health facilities and residential accommodation, where necessary with provision of adequate running water, sanitation and power supply*) to enable the delivery of quality services. Services will be strengthened at the district level and below in an integrated manner in the four tiers of the district health system.

2)Strengthening support systems capacity for HNP and GBV response service provision – *45 million US$.* This component will finance support systems and capacity-building to make the service delivery infrastructure in Cox's Bazaar(CXB) district fully functional. These support systems will comprise of HR management and development, system for behavior change communication (BCC), MIS, supervision and monitoring system, community/ citizens' engagement including grievance redress mechanism (GRM), store/ inventory management system, mechanism to address gender issues and referral system.

3)Project Management and Coordination– ***10 million US$***. Project management under component 3 will be at five levels – ministry, department, division, district and upazila. The project will be implemented by the MOHFW in close collaboration with MOWCA, but parts of the project will require implementation support from relevant UN agencies (WHO, UNICEF, UNFPA, IOM), which will be contracted by the MOHFW to provide selected services. Coordination will also take place at five levels.

4)Contingent Emergency Response Component (CERC) - ***0 million US$***.The objective of this subcomponent is to cater to unforeseen health emergency needs. In case of a health emergency in CXB, the Government may request the Bank to re-allocate project funds to this component (which presently carries a zero allocation) to support the response.

Environmental and Social Legal, Regulatory and Policy Framework

A number of relevant legal, regulatory and policy frameworks of GoB have been studied as follows:

a. National Environmental Policy (NEP), 1992;
b. Environment Conservation Rules, 1997 and its Amendment;
c. Medical Waste (Management and Treatment) Rules 2008;
d. National Women Development Policy 2011;
e. National Health Policy (NHP) 2011

Since October 2018, all World Bank (WB) funded Investment Project Financing (IPF) are required to follow the Environmental and Social Framework (ESF) consisting ten (10) Environment and Social Standards. Both the GoB and the ten ESSs have been taken in to considerations to develop this ESA so that all the measures and recommendations meet the criteria of the best practices illustrated in the legal documents and policies mentioned. Further to ESF, the WB's Environment, Health and Safety (EHS) Guidelines and Environment, Health and Safety (EHS) Guidelines for Health Care Facilities (HCF) are also guides/ references that illustrate specific criteria required for projects covering HCFs.

Environmental and Social Baseline

The environmental and social baseline status of the Project areas have been analyzed. The baseline condition of environmental and social status of the project area serve as the basis for identification, prediction and evaluation of risks and impacts. The baseline status is assessed through field studies, collection from primary and secondary sources etc.

All the health facilities in CXB are located in semi-urban or rural surroundings. Usually, those facilities have good communications and easy access from all the corners of the upazila. Many of its located just beside the main road of the town and other government offices also located around the health facilities.

Physical baseline study involved the data analysis of climate condition, temperature, rainfall etc. The cases of natural hazards like cyclones, tidal waves, landslides, flash floods have been studied to see their potential effects on the host population and FDMNs.

Environmental factors like drinking water, air and dust pollution, noise vibration have been studied as well. It is evident that the single most point of concern from environmental point of view is the ***medical, solid and liquid waste management*** (MSLWM). Given the Project's objective of providing HNP and GBV response services, the incremental medical, solid and liquid waste generated will pose risks to the medical practitioners, service seekers, general population as well as the environment. The practice of safe and perfect MSLWM is virtually negligible in CXB. A MWM guidelines along with Solid and Liquid Management Plan have been prepared for all health care facilities in CXB so that hazardous medical, solid and liquid wastes are disposed according to the best industry practice. There will be little or no effect of the Project activities on flora and fauna of the area.

The baseline survey on socio-economic information provided a foundation for evaluation of HGSP impacts and helped design the related mitigation measures to reduce negative impacts of the project and to enhance positive impacts and opportunities. The present FDMNcrisis has had a severe impact on the local population and the government HNP system in CXB. The Ministry of Health and Family Welfare (MOHFW)'s administrative capacity, both at the district and national levels, has been stretched by the FDMN influx.

There will be no land acquisition required for the Project and hence no relocation is foreseen. Further, there are no squatters located in the site who would be adversely affected by the Project activities. Further, the Project is unlikely to affect local cultural heritage and small ethnic minorities living in the Project areas as well.

The major social point of concern will be Gender-Based Violence (GBV) which may emanate from the backlash of family members of those GBV survivors who would seek treatment in the facilities. The occurrence of GBV by workers engaged in constructions has also been taken in to considerations and a GRM in the effect has also been worked out. At the moment only one One-Stop Crisis Center at Sadar Hospital and Two One-Stop Crisis Cells at Teknaf and Ukhia are providing direct GBV response services.

Environmental and Social Risks, Impacts and Mitigation Measures

a. The environmental risk is the increased generation of medical, solid and liquidwaste. Owing to enhancement the health services, additional quantities of medical, solid and liquidwaste will increase the current baseline at all tiers of the medical service providers. However, the medical, solid and liquidwaste generators at CXB including FDMN Camps by and large do not maintain effective and tangible record of the different streams of medical, solid and liquidwaste generated. The health-care workers, patients, waste handlers, waste-pickers and general population may be exposed to health risks from infectious waste, chemicals and other special medical, solid and liquidwaste. More often than not, the use of personal protective equipment (PPE) such as gloves, masks, boots, etc. is ignored.A Medical Waste Management Guide(MWMG) and a Solid and Liquid Waste Management Planhave been developed (**Annex B and C**) for the implementation stage, which should be followed by all tiers of health facilities. Further a Screening guideline for health facilities has also been developed as well (**Annex D**) which may also be referred to while screening various health facilities on ground.

b. As the project would include small scale civil works, they would cause noise, emissions, generate waste and involve risks regarding workplace and community health and safety. To project will mitigate the impacts as per the **Environmental and Social Management Plan (ESMP).**

c. Land acquisition and displacement of the households will not be required for the project. No occupant or squatters were identified within health care centers (DSH, UFC,FWC) while visits were made in the field who might be adversely affected due to Project activities. However, if squatters are found during minor constructions they will be provided with assistance according ESS-5.

d. As the project supports services to the GBV survivors, there might be a backlash to the victims from the family or from the perpetrators. The project seeks to mitigate this risk through community engagement, education of men and boys in the community and involving community leaders using CG and CSG.

e. The Project is unlikely to have any adverse effect on cultural heritage and the small ethnic minorities living in the Project areas.

f. Implementation of the project will have positive social impact by providing them with quality health services and thereby reduce loss of workdays/ employment opportunities/earning potential. The Project will also address the much under-reported cases of GBV and provision of GBV response related service both for the host population and the FDMNs.

Capacity Assessment

At the present the Ministry of Health and Family Welfare (MOHFW)'s doesn't have a dedicated Environmental and Social Team/ Unit to implement/oversee/ the recommendations/ mitigation measures illustrated in this ESA. Recommendations have been made to include **Environmental Specialists (ES), Social Specialist (ES)**and a **Gender Specialist (GS)** who will be located in the Project areas and provide intermittent inputs.Further training of field staffs (Medical Staffs, waste handlers etc) of MOHFW and the GBV staff of MOWCA as well as the awareness sessions for stakeholders will also be carried out.

Public Consultation and Disclosure

Consultation with various stakeholders including Ministries, NGOs, International Organizations, Health Officials at CXB, service recipients, local authorities and figurehead etc were consulted following the Stakeholder Engagement Plan (SEP) prepared for the project.Inadequacy of health services including those caused by the influx of FDMNs and lack of facilities surfaced through the consulting procedures. Further the state of GBV in the host and FDMN population were also taken in to consideration which illustrated the fact that the reporting was below normal and the state of service provision needs to be significantly upgraded. Thus the need for this project was highlighted as essentials from all the tiers of the stakeholders.

CHAPTER 1

DESCRIPTION OF THE PROJECT

Background of the Project

The influx of over one million FDMN since August 2017 has created an unprecedented pressure on basic services in CXB (description and map of Project area at **Annex A**) District where they have been given shelter in makeshift camps in Ukhia and Teknaf Upazilas. The crisis resulted in widespread infectious diseases, food insecurity and poverty. Government's HNP services have stretched beyond limits since the demand for the same by FDMN is phenomenal and the management resources, personnel and attention have become inadequate to serve both the host population of CXB and the FDMN.

Further the need for adequate Gender-Based Violence (GBV) services has also increased, especially for the FDMN women and girls who have faced and witnessed extreme violence prior to fleeing their home state. Their psychological trauma and distress need immediate attention to ensure an expected standard of clinical and psychosocial healing. Besides, there are also widening gaps in the provision of services like clinical management of rape, lack of safe space for women and girls including age appropriate GBV services for adolescents. Therefore, CXB needs a well-coordinated GBV services and healthcare provision for both the host community and the FDMNs.

In light of the foregoing, the Project Development Objective (PDO) of the Health and Gender Support Project (HGSP) for CXB is ***to improve delivery and utilization of HNP and GBV response services in the host and FDMN of CXB district***. The World Bank funding of $150 million will support Ministry of Health and Family Welfare (MOHFW) to do the followingcomponents: Component 1)**Strengthening and scaling up integrated HNP & GBV response services in all tiers of care in CXB**2) **Strengthening support systems capacity for HNP and GBV response service provision**; 3)**Project Management and Coordination** and 4)**Contingent Emergency Response Component (CERC)**

Project Area

The Project activities will cover the CXB District, located in the Southeast part of the country, bounded by Chattogram district on the north, Bandarban district, and Myanmar on the east, Bay of Bengal on the west and South. It has eight Upazilas covering 2491.86 Sq. km of area. The population is 2,289,990. The main river of CXB District includes Matamuhuri, Bakkhali, Rezu, Kohelia and Naf Rivers. A complete description including an administrative map is at **Annex A**.

Project Development Objective (PDO).

Improve the delivery and utilization of HNP and GBV response services among the host population

and the FDMN of CXB district

Project Components.

The Project will have following Components:

1. **Component 1: Strengthening and scaling up integrated HNP & GBV response services in all tiers of care in CXB.**This component will support strengthening of HNP and GBV response services along with the provision of a combination of selected elements of the Essential Service Package (ESP) and GBV response services; providing the requisite infrastructure (*reparation, renovation, refurbishment of existing health facilities and residential accommodation, where necessary with provision of adequate running water, sanitation and power supply*); and ensuring the availability of medicines and commodities, to enable the delivery of adequate and quality services.The public health system in Bangladesh is hierarchically structuredas a five-layer pyramid of health facilities. At the base of the pyramid there are community clinics (**CC**), which are the most proximate facilities to the communities, providing very basic health care. At the next level, are the Union Health and Family Welfare Centers (**UHFWC**) and/or the Union Sub-Centers (**USC**) / rural dispensaries (**RD**), which concentrate on maternal and child health care and provide only limited curative care. At the Upazila (sub-district) level, the Upazila Health Complex (**UzHC**) is responsible for inpatient and outpatient care, maternal and child health services, disease control and emergency care including response to gender-based violence (GBV). While the bottom three layers provide primary health care, the fourth layer of the pyramid, the District Sadar Hospital (**DSH**), provides secondary care, including some specialized services, and manages cases referred from the lower levels. The highest layer of the pyramid is the tertiary tier, consisting of the teaching hospitals attached to the medical college and post graduate institutes offering a wider range of specialty services.

Table 1. Distribution of health facilities across CXB

Under the Director-General of Health Services (DGHS)					**Under the Director General Family Planning (DGFP)**	
District Hospital **250 Bed**	Chest Clinic	Upazila Health Complex **31 Bed**	Union Sub-Center	Community Clinic	MCWC	UHFWC
1	1	7	13	184	1	49

Source: Facility Registry, DGHS and DGFP

The Essential Service Package (ESP) is central to Bangladesh Health Sector Program. The ministry has an approved ESP that they are providing at different tiers of health facilities in a phased manner. The HGSP plans to provide a combination of selected elements of both ESP and GBV response services based on the scope and the prioritization exercise done with the government at the different tiers of health facilities. ESP services will cover maternal, newborn, neonatal and child care; adolescent

health; family planning; nutrition; non-communicable diseases; curative care; and social and behavioral change interventions. The Gender, NGO and Stakeholder Participation (GNSP) unit of MOHFW has approved a protocol for GBV response by health care providers. Services will be strengthened at the district level and below in an integrated manner under this component, in the four tiers of the district health system and in the FDMN camps. The provision of HNP and GBV response services in an integrated approach rather than in silos, across the tiers of the health system, to achieve synergies between the relevant sectors and actors is an innovation which can be scaled up nationally if found to be successful.

Component 2: Strengthening support systems capacity for HNP and GBV response service provision. This component will finance support systems and capacity-building to make the service delivery system in CXB fully functional. These support systems will comprise: (a) human resource management and capacity development; (b) management information system; (c) store management system; (d) healthcare waste management system; (e) referral system; the project will also institutionalize modalities for delivery of: (f) community engagement and participation; and (g) behavior change communication.

Component 3: Project Management and Coordination. Project management will be at five levels – Ministry, Department, Division, District and Upazila. At the Ministry level, the three Secretaries (Health *Service Division and Medical Education and Family Welfare of the MOHFW; and MOWCA*) will be supported in their oversight function. The two Director Generals of Health Services (DGHS) and Family Planning (DGFP) will be responsible for project monitoring. The project will be implemented by the MOHFW in close collaboration with MOWCA.The project will put in place specific mechanisms for coordination at all the five levels. At the Ministry level, coordination will help to monitor the progress and provide strategic direction. At the directorate level, quarterly coordination meetings between the two DGs will oversee the implementation and provide guidance. At the district level, CS, DDFP, and Deputy Director, Women Affairs (DDWA) will coordinate internallyon the proposed project.

Component 4: Contingent Emergency Response Component (CERC). The objective of this subcomponent is to cater to unforeseen health emergency needs. In case of a health emergency in CXB, the Government may request the Bank to re-allocate project funds to this component (which presently carries a zero allocation) to support the response.

Objective of the Environmental and Social Assessment (ESA)

Objectives of this ESA are to:

a. Conduct a rapid review of the environmental and social issues relating to HGSP in CXB district;
b. Prepare an ESA (both potentially positive and negative) in line with the ESF including mitigation measures and recommendations to ensure
    i) all environmental impacts are duly mitigated
    ii) all social impacts are appropriately addressed
    iii) ensure, especially, health and safety of the workers, service providers and patients who will be exposed to health risk;
c. Identify applicable provisions of GoB and World Bank policies/acts/regulations/ESS for the project and recommend measures to fill gaps between the requirement of GoB and World Bank;
d. Identify potential areas of improvement/ capacity building for country institutions for management of environmental and social issues;
e. Identify various stakeholders and develop a Stakeholder Engagement Plan (**SEP**) and disclosure procedure for engagement and consultation with the same
f. Provide inputs to the Borrower's Environmental and Social Commitment Plan (**ESCP**);

Approach and Methodology

The study has been conducted in accordance with Environment Conservation Rules, 1997, Government of Bangladesh (GOB) EIA Guidelines, 1997, Acquisition and Requisition of Immovable Property Act 2017 and World Bank Environmental and Social Standards (ESS) . The study is based on both primary and secondary data and information. The primary data includes data collected from field observations, consultations with MOHFW, MOWCA, officials of DSH, Civil Surgeon of CXB,various tiers of health facilities, local and international NGOsand service recipients. Secondary data includes review of the Bangladesh statistical and relevant data/information from various Government Departments.The data generated allowed to establish the baseline conditions as well as obtain feedback from potential service recipients. Once this baseline was established it was used as a reference point to identify potential environmental and social impacts and risks and subsequent development of measures to prevent, mitigate or manage them.

CHAPTER 2
LEGAL, REGULATORY AND POLICY FRAMEWORK

General

Various legal and regulatory requirements of both the GoB and WB toward protection and conservation of environment and the protection of social system from the risks and impacts of the projects have been studied and pertinent laws/ policies are described in this chapter.

Relevant GoB Policies and Laws

National Environmental Policy (NEP), 1992

The NEP sets out the basic framework for environmental action together with a set of broad sectoral guidelines for action. Major elements of the policy covers maintaining of the ecological balance for ensuring sustainable development; protection of the country against natural disasters; identifying and controlling activities which are polluting and destroying the environment.

Environment Conservation Rules, 1997 and its Amendment

The Environment Conservation Rules (ECR), 1997 and its amendment in 2010 provide a first set of rules under the ECA, 1995. These provide standards and guidelines for requirement for undertaking Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA), as well as formulating an Environmental Management Plan (EMP) according to categories of industries/development projects/activities.

Medical Waste (Management and Treatment) Rules 2008

The GoB promulgated the Medical Waste (Management and Treatment) Rule, 2008 for processing and management of MW in Bangladesh. It was prepared through active participation of MOHFW, MOL and MOEFCC mainly with the objective of proper management of medical waste and protecting the environment. The Medical Waste (Management and Treatment) Rules 2008 forms the base of management of all medical waste in the country. The law provides for guidance on the collections, storage treatment and disposal of medical waste for management facilities/operators.

National Women Development Policy 2011

This policy was developed with the objective to establish equal rights of men and women in areas of state and public life, to ensure security and safety of women, to ensure the socio-

economic, political, administrative and legal empowerment and to establish human rights of women.

National Health Policy (NHP) 2011

National Health Policy (NHP) 2011 views access to health as a part of recognized human rights. In order to achieve good health for all people, equity, gender parity, disabled and marginalized population access in health care need to be ascertained.

World Bank Environment and Social Framework and Standards (ESF/ESS)

Since October 2018, all World Bank funded Investment Project Financing (IPF) are required to follow the Environmental and Social Framework (ESF) consisting ten (10) Environment and Social Standards (ESS). These ESSs set out their requirement for the borrowers relating to the identification and assessment of environmental and social risks and impacts associated with any project. The ESSs support the borrowers in achieving good international practice relating to environmental and social sustainability, assist them in fulfilling their national and international environmental and social obligations, enhance transparency and accountability and ensure sustainable development outcome through ongoing stakeholder engagement. A brief description of the ten (10) ESS are appended below:

ESS1: Assessment and Management of Environmental and Social Risks and Impacts

ESS1 clarifies client's responsibilities in identifying and managing the environmental and social risks for the project. The proposed project will provide HNP and GBV response services for both the host and FDMN populations in CXB. The health-care workers and the community may be exposed to health risks from medical, solid and liquidwaste if not properly treated and managed. Also, minor repair and renovation works for establishing OCCs will generate construction related impacts and involve risks regarding workplace and community health and safety. The construction will not adversely affect any squatters. Most of the adverse impacts are expected to be limited to the local environment.

ESS2 Labor and Working Conditions

This ESS illustrates the assessment of labor risks and working conditions. The assessment includes risk from project activities and key labor risks such as hazardous work, child labor and forced labor, migrant or seasonal workers, discrimination against women, vulnerable groups, etc., labor influx, occupational health and safety, possible accidents and emergencies, risks of GBV among others.

ESS3 Resource Efficiency and Pollution Prevention and Management

This ESS helps assess project impacts on resource use and efficiency and pollution and how the project can prevent and manage pollution. Accordingly this ESA assesses energy use, water use andspecifically medical, solid and liquidwaste generation, its impacts and risks including the mitigation measures. It also looks into impacts on air quality, generation of hazardous and non-hazardous wastes in accordance with internationally or nationally accepted methodology.

ESS4 Community Health and Safety

This ESS covers risks and impacts of a project on overall community health and safety. Due to the project execution, the community may be exposed to a complex variety of health and safety hazards including construction activities related risks, disruption in movement, GBV risks etc. A Community Health & Safety Plan is required which will include procedures on incident investigation and reporting, recording and reporting of non-conformances, emergency preparedness and community awareness raising activities.

ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement

Many projects require land acquisition and the resultant relocation and compensation management is detailed in this ESS. HGSP will not require any land acquisition. Renovations and improvements of the existing health facilities will also not adversely affect any squatters as well. No squatters also have been found who may be adversely affected by the Project activities. The ESAhas assessed such effects.

ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources

Effect on the biodiversity of the project area and the measures to be taken to mitigate the same is discussed in this ESS.Planning of the HGSPwill be carefully done such a way that the activities under the project will not affect forest or any biodiversity prone area. To provide services during small scale construction/repair of the existing structure small scale temporary health camps may need to be constructed within existing structure area the affect of which on the biodiversity of the area is envisaged to be nil.

ESS7 Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities

CXB district has a small number of small ethnic and religious minority community living in the area. The ethnic minority communities has been identified through extensive consultation while the ESA was conducted. However, it is envisaged that they will not be adversely affected by the Project activities and hence no IPP may be needed.

ESS8 Cultural Heritage

The Project activities will mostly be restricted to CXB health facilities and FDMN camps where there has not been any cultural heritage site found. Hence the Project is unlikely to affect any cultural heritage object or site. However, a chance find procedure will be included in works contracts requiring contractors to stop construction if cultural heritage is encountered during any work and to notify and closely coordinate with relevant mandated country authority for the salvaging and restoration of such cultural heritage.

ESS9 Financial Intermediaries

The proposed project will not involve any financial intermediaries.

ESS10: Stakeholder Engagement and Information Disclosure

This ESS illustrates the provisions of consultation with all relevant stakeholders of the project so that every project activities reflect the will of the beneficiaries and the project is designed with the inputs of those who are affected by the project. Consultations with all stakeholders throughout the project lifecycle paying attention to the inclusion of women, vulnerable and disadvantaged groups will be carried out. A Stakeholder Engagement Plan (**SEP**) has been prepared with feedback from interested parties. The main beneficiaries of the project are the host and FDMN populations in CXB District, particularly female. System for grievance redressal and OCCs (GBV response cell) will be established in all the health facilities under the project. Grievance Redress Mechanisms (GRM) will be set up to address complaints in a timely manner and following due process. The GRM will be cognizant of and follow required levels of discretion, and cultural appropriateness, especially when dealing with cases of sexual harassment and GBV.

A Relative Comparison between GoB and WB Laws/ Policies

Various relevant GoB and WB Policies and Laws have been studied and the following table presents a synopsis of the relevant policies and the actions need to be taken.

Table 2. Comparison between GoB and WB Laws/ Policies

Issues	GoB Policy	WB Policy	Actions Taken
Environmental and Social Assessment	National Environmental Policy, 1992 & Environmental Conservation Rules, 1997 requires to assess the environmental impact assessment before commencement of any development activities.	Environmental and social assessment is required as per the ESS1: Assessment and Management of Environmental and Social Risks and Impacts	The sub projects will be screened to ensure that they are covered by both the national and WB policies on EIA and appropriate site specific ESMPs are prepared based on screening results.
Environmental Pollution	There are several laws related to environmental	ESS3 Resource Efficiency and Pollution Prevention	The HGSP itself considering the resource

	pollution and specific laws of Medical Waste Management (MWM).	and Management requires all types of pollution and its necessity of mitigation.	efficiency and the ESA also addressing in its assessment.
Gender and GBV Issues	Women Development Policy 2011	ESS 2 Labor and Working Condition, ESS 4 Community Health and Safety	Adequate measures to address gender issues and GBV including GRM have been addressed in this ESA
Stakeholders consultation and disclosure	GOB Act (ARIPA 2017) does not recognize consultation with the people rather to preparation of LAP and payment of compensation and displacement without follow up.	World Bank 'ESS-10Stakeholder Engagement and Information Disclosure' is to be addressed. Meaningful consultation with the stakeholders is to be held and opinion of various stakeholders are to be incorporated in SEP	In the HGSP, various stakeholders have been consulted during preparation of the SEP. Stakeholders engagement plan has been prepared to follow during implementation of the project.

CHAPTER 3

ENVIRONMENTAL AND SOCIAL BASELINE

General

The baseline condition of environmental and social status of the project area serves as the basis for identification, prediction and evaluation of risks and impacts. The baseline status is assessed through field studies, collection from primary and secondary sources etc.

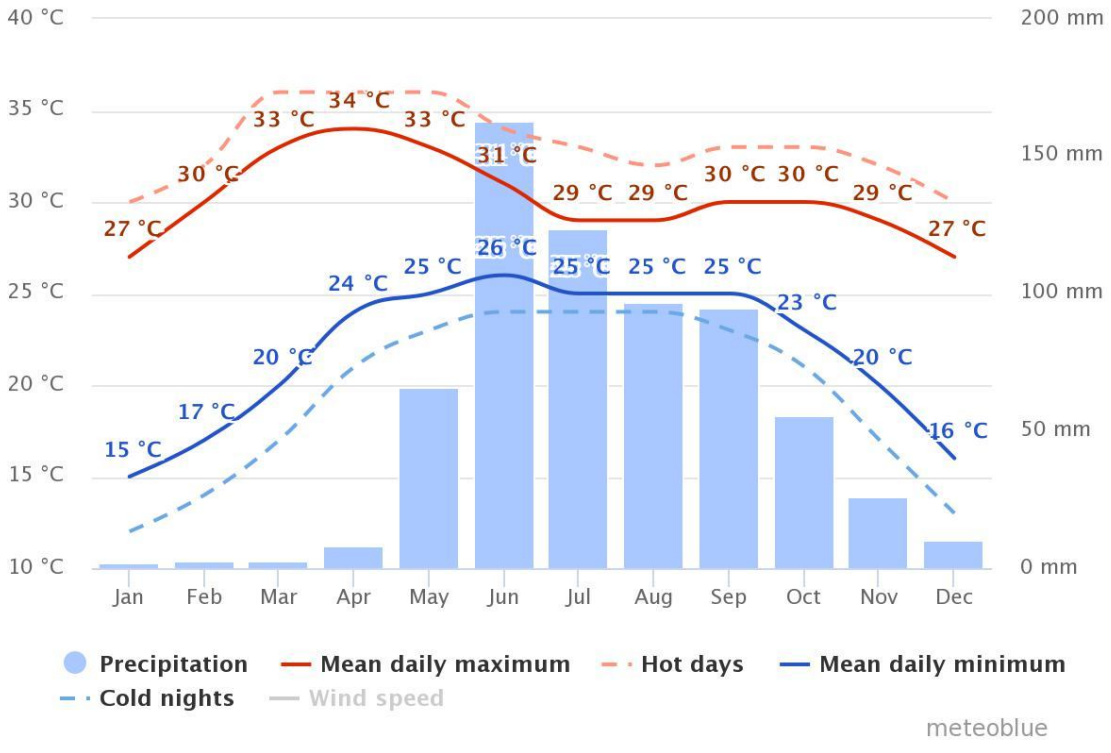
Physical Environment

Climate Condition

The climatic condition of the whole project area has been collected from CXB meteorological station which includes temperature, and rainfall.

Temperature

Bangladesh has warm temperatures throughout the year, with relatively little variation from month to month. Figure below shows the mean daily maximum and minimum air temperature of 30 years of CXB. As temperature record shows, April is the warmest month. Although in short spell, there exists a winter season in Bangladesh from November to February.



***Source: Meteoblue*[1]**

Figure 1. Temperature CXB

[1] https://www.meteoblue.com/en/weather/forecast/modelclimate/cox%e2%80%99s-b%c4%81z%c4%81r_bangladesh_1336134

Rainfall

Heavy rainfall is characteristic of Bangladesh frequently causing flood across the country or at local scale. With the exception of the relatively dry western region of Rajshahi, where the annual rainfall is about 1,600 mm (63.0 in), most parts of the country receive at least 2,300 mm (90.6 in) of rainfall per year. Figure below shows the average monthly precipitation of 30 years of CXB including number of sunny, partly cloudy and rainy days:

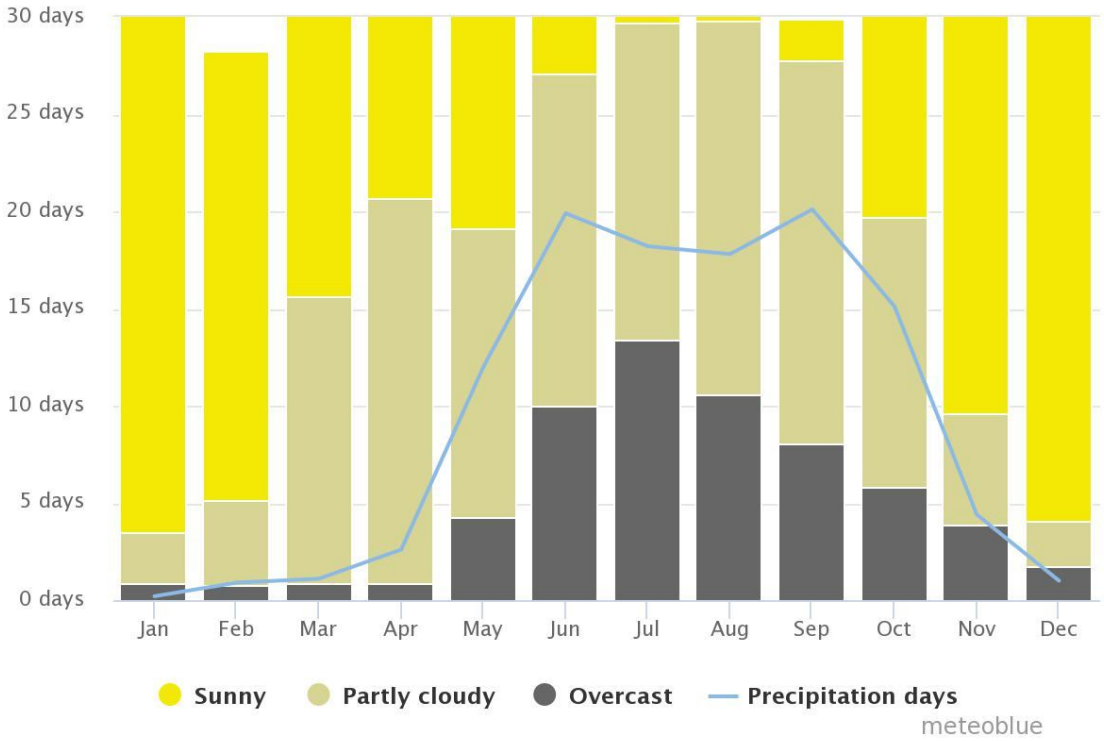


Figure 2.Number of Sunny, Rainfall and Cloud Coverage Days in CXB

Topography and Soils

Nearly 12.5 percent area of Bangladesh in north northeast and south-southeast regions is hilly. Topography of the eastern hill region is steeply dissected uplands with valleys between the hills that slope towards the west.

Baseline Land Use

The Sadar Hospital is located in the Sadarupazila that was converted into urban use for many years ago. Further, the other UzHCsare also located in semi-urban or in its immediate surroundings. Usually, those facilities have good communications and easy access from all the corners of the upazila. Many of its located just beside the main road of the town and other government offices also located around the health facilities. Alternatively, the UHFWCs and CCs are located within a residential area of a remote village but those also have good communication facilities. Therefore, all the health facilities are

generally located in the middle of urban or rural area and there are no protected areas, wetlands, mangroves, or estuaries in or near the facilities.

Natural Hazards

In Bangladesh, due to its unique geographic location, suffers from devastating tropical cyclones frequently. The funnel-shaped northern portion of the Bay of Bengal causes tidal when cyclones make landfall due to which thousands of people living in the coastal areas are affected. Some of the most devastating natural disasters in recorded history with high casualties were tropical cyclones that hit the region now forming Bangladesh (Wikipedia, 2015). The project area including the FDMN influx area has a history of occurrence of landslides, flash floods and tidal surges. Although the main area of FDMN camp is located outside the flood zone, the camps are vulnerable to extreme weather conditions such as cyclones such as cyclones and have to withstand major precipitation and strong winds. The steep slopes may become unstable in the monsoon seasons and cause landslides, shelter damage and other destruction. Due to the indiscriminate hill cutting to provide shelters to the FDMNs, the terrain of the hills has lost their natural setting, causing a potential risk of landslides.

Environmental Quality

Within a relatively small geographic boundary, Bangladesh enjoys a diverse array of ecosystems especially in CXB. Being a low-lying deltaic country, seasonal variation in water availability is the major factor, which generates different ecological scenarios of Bangladesh. Being the one of the world's largest refugee camp, CXB hosts over one million FDMNs since 25 August 2017. The emergency is putting immense pressure on scarce natural resources in the area, resulting in degraded natural forests, barren hills and an emerging water crisiscoupled with the host community and FDMN from past influxes, the crisis affected population is now almost 1.5 million in CXB, creating massive pressure on the already dilapidated environment of CXB, which still remains significantly underfunded.

Drinking Water

The geography of FDMN settlements in southern Teknafis such that groundwater is not available through boreholes. All water must be preserved by capturing rain water in small reservoirs – something that is now depleted. Water shortages in CXB occur during the summer period and affect FDMN and the local population alike. Many health care centers suffer from inadequate water supply/ water sources. Drinking water is being supplied from a distance place and storing them in water tank to provide drinking water among the peoples. As part of this ESA study, four (04) water samples were collected to measure the quality and all of them were found to comply with the drinking water quality standards set by DOE. However, renovations/ refurbishing/repair of water supply systems in all tiers of health facilities is urgently required.

Air and Dust Pollution

The SadarHospital and UzHC are located beside the main road and thus the vehicular emissions are main source of air and dust pollution of these areas. But in case of the CC and FWCs the air quality is in a rather good condition due to low emission and distances from the main road.

Noise and Vibration

The Sadar Hospital and UzHC are crowded with people and different vehicular movements. In cases of FWCs and CC, they are much quite as they are located in the rural region and the vehicular movement is comparatively lower than the previous facilities. Noise level has been monitored at four (04) locations along the project area during day time. The results show that time weighted average value of the sound monitored at four different locations of the project influence area did not exceed the standard fixed.

Medical, Solid and LiquidWaste Management

Medical, Solid and Liquid Waste Management (MSLWM) is now an urgent need in CXB, considering the pressure caused by the over-population and the massive volume of waste produced daily in the crammed area. The culture of dumping waste has assumed a formidable problem. The traditional method of managing medical, solid and liquidwastes have been followed by almost all the health care facilities (**refer to Annex B and C**). Traditional waste management includes the collection of the wastes and either bury them in the ground after performing incineration or simply just bury them in the ground. The present practice of medical, solid and liquidwaste disposal at CXB is enumerated below:

a. There are inadequate color-coded and labeled waste bins in most health service providers. This compromises the medical, solid and liquidwaste segregation at the source of generation. The practice of waste segregation at the source of generation is rare.

b. Plastic bags are used for transportation of Infectious and non-infectious wastes causing risks to waste handlers. These are also openly transported.

c. There is only one incineration facilities in the Sadar Hospital which has been newly setup. It has a capacity of 500kg and is used presently in two shifts of 250 kg each. The incinerator meets emission criteria and is operated by 5 trained operators in shifts.

d. Generation of pathological waste and its disposal is also an issue of concern the current practice of which has been illustrated in **Annex B**;

e. Significant risk of infection also arise from indiscriminate disposal, open burning, burying, and disposing in municipal waste bins.

Waste Dumping and Burial Site, RamuUpazila Health Complex

Waste Dumping Site, MoheshkhaliUpazila Health Complex

Sharp Waste Collection in Chater Bag, KutubdiaUpazila Health Complex

Waste Burial Site, Union Family Welfare Center, Moheshkhali

Food Waste Dumping Site, Hospital Premises

Collection of Wastes

Figure 3. Medical, Solid and LiquidWaste Collection and Management in CXBSadar Hospital

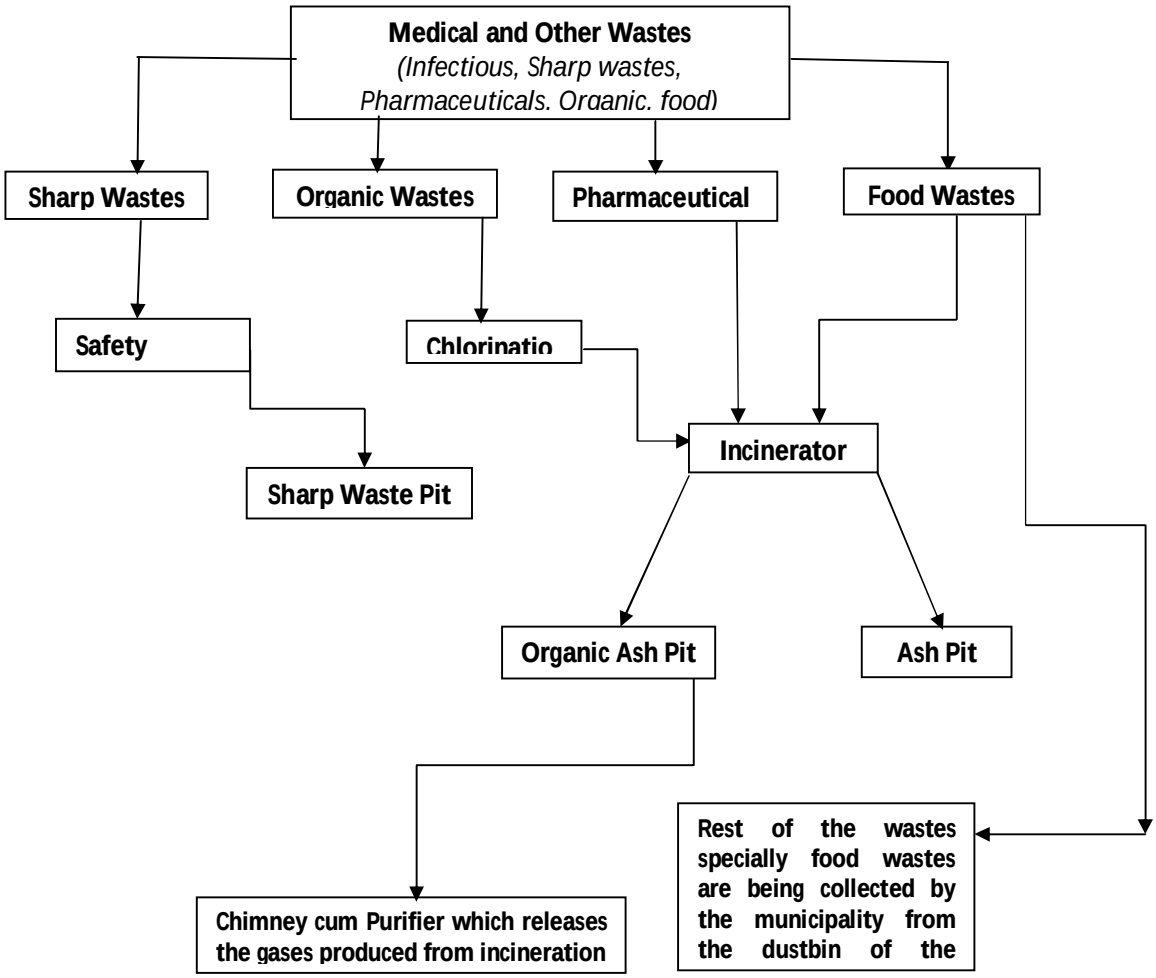


Figure 4: Present Medical and Other Waste Management Diagram of CXB Sadar Hospital

Biological Environment

Terrestrial Flora

The terrestrial ecosystemsof the project area include hilly lands, roadside plantation and locally block plantation. Dominant forest species are Koroi (Albaziaspp), Gamar (Gamelinaarborea), etc. Dominant tree species on roadsides are Jackfruit (Artocurpusheterophylus), Mango (Maniferaindica), Neem (Azdirectaindica) etc. There are intermittent forests along the CXB Sadar to FDMN camp routes.

Terrestrial Fauna

The diversified habitat and ecosystem in the CXB district support various types of animals. Primary and secondary mode was adopted for identification of fauna. The vertebrates are found within the project area are toad, bull frog, green frog. The avifaunal species are dove, pigeon, koel, crow pheasant, owl, sparrow, jungle babler, grey tailored birdwater hen, crane, duck, etc.

Fisheries

A wide variety of indigenous and exotic fishes including carps' catfishes and many smaller species are available in CXB. Fish is and essential staple and plays a very important role in the economy of the area. The species found along then project influenced areas are Kalabaush (Labeocalbasughonia (Labeogonius), Boal (Wallagoniaattu), Gazar (Channamarulius), Koi (Anabas testudineus), Hilsha (Hilsailisa) etc.

Socioeconomic Environment

The baseline socio-economic information provides a foundation for evaluation of HGSP impacts and related mitigation measures to reduce negative impacts of the project and to enhance positive impacts and opportunities. The data includes among others, status of health services and support and GBV prevalence in the area under HGSP.

Area wise Populations: The area wise population of CXB is appended in the table below:

Table 3. Area wise Population - CXB

Upazila	Household	Population			Sex ratio (M/F)	Average size of household	Density per sq. km.
		Male	Female	Total			
Chakaria	88391	239198	235267	474465	102	5.4	942
CXB Sadar	82683	241637	217445	459082	111	5.3	2011
Kutubdia	22587	64093	61186	125279	105	5.5	581
Moheskhali	58177	165693	155525	321218	107	5.5	887
Pekua	31944	86310	85238	171538	101	5.4	1229
Ramu	47904	135000	131640	266640	103	5.5	681
Teknaf	46328	133106	131283	264389	101	5.7	680
Ukhia	37940	104567	102812	207379	102	5.4	792
Total	**415954**	**1169604**	**1120386**	**2289990**	**104**	**5.5**	**919**

Literacy Rate: Literacy rate among the people in CXB district is lower than that of national average. The average literacy rate of CXB is 39.30% while the National literacy rate is 47.68 according to census 2011.

Table 4.Area Wise Literacy Rate of CXB

Upazila	Literacy rate (%)
Chakaria	47.60
CXBSadar	49.20
Kutubdia	34.0
Moheskhali	30.80
Pekua	35.30
Ramu	36.60
Teknaf	26.70
Ukhia	36.30
Average	**39.30**

Health Facilities in CXB District

There are one central hospital in CXB (District Sadar Hospital),sevenUzHC, 49 Union Family Welfare Center, 13 Sub Centers, 184 Community Clinics, One One-Stop Crisis Center and Two One-Stop Crisis cells in CXB district. The One stop Crisis center is located at District Sadar Hospital while Crisis Cells are established at FDMN camps Kutupalong and Teknaf under respective UzHCs. Tables beneath show existing health care facilities under CXB district.

Table 5:Current Numbers of Health Care Facilities in CXB District

Under the Director-General of Health Services (DGHS)	Under the Director General Family Planning (DGFP)

District Hospital **250 bed**	Chest Clinic	Upazila Health Complex **31 Bed**	Union Sub-Center	Community Clinic	MCWC	UHFWC
1	1	7	13	184	1	49

Table 6:Utilization of services at UzHC

Indicators	Ramu Upazila	ChakariaUpazila	KutubdiaUpazila	MoheskhaliUpazila	PekuyaUpazila	TeknafUpazila	UkhyiaUpazila
Total Patient days in 365 days (No.)	13,193	28714	6297	19902	6231	6858	9271
Bed Occupancy Rates (%)	116.60	157.34	34.50	109.05	55.07	37.58	50.80
Average Length of Hospital Stay (No. of days per patient)	2.06	1.75	1.53	0.96	1.72	1.00	1.48
Hospital Death Rate (%)	0.34	0.06	0.24	0.12	0.14	0.05	0.20

***Ref:** Health Bulletin 2015, DGHS*

Health, Nutrition and Population (HNP) Status in CXB

Health Nutrition and Population (HNP) services are provided to the host population in the CXB district by the GoB through District Sadar Hospital, UzHC, UFWC and CC. The CXB DSH has a sanctioned bed-strength of 250 along with 90 additional beds distributed among the special care neonatal unit (SCANU), intensive care unit (ICU), cardiac care unit (CCU), one-stop-crisis-center (OCC) and private rooms. The bed occupancy is twice than that of capacity.

Water supply, sewage facilities, waste management, drainage, waiting room for the patients and above all quality of the hospital building is seemed poor. Numbers of Doctors against huge quantity of patients, medicine and other necessary apparatus are not adequately available. Therefore, people do not get proper services in the Sadar Hospital. In the UzHC there is no officially arranged Emergency Health Care Service. This is operated by the initiative of the UzHCs under special arrangement considering urgency and need of the people. Scarcity of medicine and Doctor is highly noticeable. It is observed that Diabetes patients (mostly over aged) both male and female take service from the UzHC. It is a very good sign that the UzHC

provides such services at Upazila level,holds Upazila Family Planning Officer (UFPO) along with FWV, FWA and other officials at Upazila and Union level (Union Family Welfare Center) provide family planning related services. It is noticeable that some of the islands in CXB district including Sonadia Island of Moheshkhali have no government sponsored health care facilities except UPI once a month.

The crisis has had a severe impact on the local population and the government HNP system in CXB. The Ministry of Health and Family Welfare (MOHFW)'s administrative capacity, both at the district and national levels, has been stretched by the FDMN influx.The limited human resources available to the district administration are almost entirely focused on the crisis, leading to inadequate attention to the routine services for the host population. MOHFW has temporarily assigned health professionals to work in the district, who are often rotated in and out, thus posing a challenge to develop sustained services of good quality.

In the Sadar Hospital (CXB) a One Stop Crisis Center (OCC) has been established to deal with the GBV cases. A set of officials including Doctors, Nurses and Counsellor have been posted in the OCC under the Ministry of Women and Children Affairs. This OCC deals with the GBV cases of the host population only. Apart from this, one stop crisis cells have been established in Teknaf and Ukhia Upazilas (Kutupalong Camp).

GBV including physical assault and sexual assault are primarily reported to Police Stations and /or One-stop Crisis Center (DSH) and two Cells (Kutupalong and Teknaf) as well. In both cases Police stations and OCC make links each other to supplement the investigation. In many cases the victim don't want to take legal action due to insecurity and social dignity. They keep the incident hidden or settle among the two parties.

Status of Gender Based Violence (GBV) in CXB

Host Population. The provision of GBV services to the host communities in CXB has been limited. Only the OCC AT DSH and two Cells at Ukhia and Teknafserves the host community. The remaining services are dedicated to displaced FDMN women and children. However, the GBV issues are also serious among the local population and services to them are badly needed as well. A survey on violence against women conducted by the Bangladesh Bureau of Statistics in 2015 found that 48 percent of ever-married women in Chittagong division had experienced physical and/or sexual violence - with 22% reporting an experience in the preceding 12 months. Additionally, a recent assessment of GBV services in CXB district carried out by humanitarian agencies found gaps in vital health services such as the clinical management of rape, in addition

to a marked lack of safe space programming for women and girls, including age-appropriate GBV services for adolescents. CXB currently lacks integrated GBV and health care provision across the district.

Table 7: OCC at DHS Data - January 2017- August 2019

Category	Physical Assaault	Sexual Assault	Burn	Out door Victim	Total	Counseling	Cass file in Court/ Thana	Mediation	Processing	Not interested to legal Support	Follow up Meeting
Children	17	195	0	309	521	1084	704	100	68	254	Meeting-6 Person-51
Women	287	147	4	167	605						
Total	304	342	4	476	1126	1084	704	100	68	254	M-6 P-51

Table 8: OCC at DHS Data - August 2019

Category	Physical Assault	Sexual Assault	Burn	Outdoor Victim	Total	Counseling	Case file in Court/ Thana	Mediation	Processing	Not interested to legal Support	Follow up Meeting
Children	1	15	0	21	37	50	42	2	8	0	Meeting-1 Person-6
Women	1	5	0	9	15						
Total	2	20	0	30	52	50	42	2	8	0	M-1 P-6

FDMN. The vulnerability of displaced FDMN women and girls (52% of FDMN) to various risks, including GBV, is high. UN agencies and local non-government organizations (NGOs) report high levels of GBV among the FDMN women[2]. Psychosocial distress is acute and ongoing, as the FDMN have witnessed horrific violence in Myanmar. While more women are now working as volunteers and group leaders, stepping out of the confines of their homes, stringent social norms and fear of sexual assault and trafficking limit their role in the public sphere and opportunities for economic activity. Displaced FDMN People are reported to suffer from the flashback of the massacre, anxiety, acute stress, recurring nightmares, sleep deprivation, eating or even speaking disorder due experience or witness of methodical rape on women and girls and violent deaths of family members. There has been increase in the incidence of sexual violence among the FDMN in Bangladesh which was exacerbated by the unavailability and low quality of post-rape care services. From the end of August 2017 to the end of February 2018, MSF has treated 226 survivors of sexual violence at MSF's Sexual and Reproductive Health Units, out of which 162 of them were rape survivors. Majority of the survivors were below 18 years[3]. Children face the danger of long-term psychological and social distress. Since FDMNs are dependent on the humanitarian assistance for their survival and struggle daily for food assistance, this acts as a stressor for majority of them as well.

Table 9: One-Stop Cell at Ukhiya(FDMN Victims) - January 2017- August 2019

Category	Physical Assault	Sexual Assault	Burn	Child Marriage	Mental	Others	Total
Total	1062	376	8	60	455	115	2076

[2]https://reliefweb.int/sites/reliefweb.int/files/resources/briefing-violence-against-rohingya-women.pdf
[3]MédecinsSansFrontières. Bangladesh: Activities update on Cox's Bazar. Geneva: MSF; 2018.

CHAPTER 4

ANTICIPATED ENVIRONMENTAL AND SOCIAL RISK AND IMPACT

Environmental and Social Risk Assessment

An environmental and social risk assessment of the project was carried out to see the major risk factors that may need intervention. During the project implementation, environmental and social screening will be carried out followed by ESMPs based on screening results prior to commencement of civil works.

Table 10. Risk Assessment Matrix of the Proposed Sub-project

Environmental and Social Risk Factors	Required Intervention
Existing Utilities will require to cease operation during renovation. Service seeker may not be provided with services.	Alternative/makeshift arrangements need to be provided on *ad hoc* basis
Drinking Water Quality	Mitigation measures are already given in the ESMP. Water quality test is proposed for monitoring.
Air quality	Mitigation measures are already given in the ESMP. Air quality test is proposed for monitoring.
Noise & Vibration	Mitigation measures are already given in the ESMP. Noise level measurement is proposed for monitoring.
Medical, Solid and Liquid Waste	Mitigation measures are already given in the ESMP and **Annex B and C** as Medical, Solid and Liquid Waste Management Guideline.Further a Screening guideline for health facilities has also been developed as well (**Annex D**) which may also be referred to while screening various health facilities on ground.
Community Health and Safety	Mitigation measures are already given in the ESMP.
Small Ethic Communities	Mitigation measures are already given in the ESMP.
Workers Health and Safety	Mitigation measures are already given in the ESMP.
Land Acquisition	There will be no land acquisition in this project
Gender-Based Violence (GBV)	GBV in host population and FDMN occurs most of which go underreported. A GBV action plan will need to be developed including GRM

Social Impacts and Risks

Gender-Based Violence (GBV)

The most obvious positive impact of the proposed project is to improve the delivery and utilization of HNP and GBV services among the host population and the displaced FDMN population (FDMN) of Cox's Bazaar district. Strengthening and expanding the network of One-Stop Crisis Cells to improve coverage for GBV first-response services across the district. This project will strengthen the two existing ***One-Stop Crisis Cells*** and set up 2 or 3 new cells at selected UzHCs in CXB. The cells are the first point of contact for GBV survivors, where only basic treatment is provided, with most people being referred to

the OCC. The OCC at DSH will be strengthened to provide better support and care to a greater number of GBV survivors. This will be done by (i) recruiting more staff and providing them with specialized training to handle GBV issues, including confidentiality and adherence to GBV protocols; (ii) expanding the range and quality of services to be provided, including psychosocial help and counselling services, linkages to other support services (such as police or legal aid), and managing GBV beyond sexual assault (e.g., acid and burn injuries, mental torture, intimate partner violence) and the associated trauma. A number of WFS are being established through other WB financed operations in the camps. These WFS provide basic health services and psychosocial assistance and are a critical first port of call for women who may be experiencing GBV within the camps.

Land Acquisition

Renovation or reconstruction of the structures in the DSH, UzHC, UFWC or CC will not require land acquisition. The designated areas of the health care institutions are well defined.No squatters or encroachers were found during field visits within the boundary of the institutions proposed for improvement under the HGSP. However, if squatters are located during minor constructions they will be provided with assistance according ESS-5.

Impact on Small Ethnic Communities

In the CXB districts there are some small ethnic communities. But it has been envisaged that the Project activities will not affect them adversely hence there is no need of an Indigenous Peoples Procedure (IPP).

Summary of impacts

Environmental Impacts:

a. The key environmental impact is mainly from medical, solid and liquidwaste, when not properly managed. Owing to enhancement the health services, additional quantities of medical, solid and liquidwaste will increase the current baseline at all tiers of the medical service providers. However, the medical, solid and liquidwaste generators at CXB including FDMN Camps by and large do not maintain effective and tangible record of the different streams of medical waste generated. The health-care workers, patients, waste handlers, waste-pickers and general population may be exposed to health risks from infectious waste, chemicals and other special medical, solid and liquidwaste. More often than not, the use of personal protective equipment (PPE) such as gloves, masks, boots, etc. is ignored. A Medical waste management guidelines and Solid and Liquid Waste Management Plan have been developed for this purpose (**Annex B and C**).

b. As the project would include small scale civil works for repair/renovation of CCs, Union Level Health Facilities (UHFWC/USC/RD), UzHC and DSH including OCC expansion and developing One stop Crisis cells at the hard-to-reach Upazilas and repair renovation of family accommodations therein, these civil works would cause noise and emissions from vehicles and machinery, generate waste and involve risks regarding workplace and community health and safety. To project will mitigate the impacts as per the environmental management plan.
c. Similar environmental impacts are expected from the FDMN camps too. However, construction related pollution would be negligible in the FDMN Camps.

Social Impacts

a. Land acquisition and displacement of the households will not be required for the project. As such preparation and implementation of RAP will not be required.
b. During field visits no occupant or squatters were identified within health care centers (DSH, UzHC, FWC, CC) who would be adversely affected by Project activities, so no one is likely to be physically displaced by the project interventions. However, if squatters are found during minor constructions they will be provided with assistance according ESS-5.
c. As the project would provide GBV response services to the GBV survivors, there might be a backlash to the victims from the family or from the perpetrators. The project seeks to mitigate this risk through community engagement, education of men and boys in the community and involving community leaders using Community Groups and Community Support Groups.
d. Implementation of the project will have positive impact on the people's income and livelihood by providing them quality health services.
e. Overall, the positive social impacts of the project are likely to be substantial compared to negative impacts and risks.

CHAPTER 5

ANALYSIS OF ALTERNATIVES

Background

Analysis of alternatives involves the examination of optional solutions. Optional solutions have been assessed by MOHFW during the early stages of the Project planning with WB. Location of the subprojects is being identified during project preparation by analysis of various possible alternatives through technical, economic, social, and environmental considerations. The project is focused to the renovation and improvement of the existing health care facilities, the mitigation measures have been identified and listed in the Environmental and Social Management Plan. Thus, the alternative options regarding this project have not been considered and the reasons are listed in with and without project section.

With Project

Implementation of the project will contribute to socioeconomic and health improvement and will have positive impacts on residents' life quality. The 'With Project Alternative' has the following advantages:

- There will be improved and assured health facilities to the residents in the project area and the FDMNs.
- Health conditions will stimulate socio-economic development of the area. The inadequate health facilities are major deterrent to health and economic improvement in the area.
- The project will also provide GBV response services. This will cause more women to come forward and seek such services which will address this issue of social taboo and in the long run will create an atmosphere for ensuring women's voice across the district.

Social Consideration

All the HCFs are built on the public land except for the CCs which are built on the donated land. There are no houses and other structures as well as utilities are located within the HCFs. The HCFs are located both in urban and rural areas and there are many residential & other houses. So, all the sites are suitable in social consideration as per Social Study. And no alternative locations are required since there will be land acquisition and no squatters have been found that will be adversely affected for Project activities. Also the small ethnic minority groups present in the Project areas will not be negatively affected by the Project.

Environmental Consideration

No flora or fauna in the Project area will be affected by the project. The biodiversity will remain unchanged since no new HCFs will be built and will go through minor renovations. No cultural sites and water bodies are located in the HCF sites. Additionally, proposed medical waste management plant along with solid and liquid waste management plan have been developed to manage the Bio-medical, solid and liquid wastes in environment friendly manner. Considering the environmental point of view, this project is suitable for furtherrenovation of HCF buildings and no alternatives may be required.

Without Project

The 'No Project Option' in respect to the proposed project implies that the status quo is maintained. This option may be suitable alternative from an environmental perspective as it ensures non-interference with the existing environmental conditions. This option will however, involve several losses on socioeconomic condition to the local population. The status of health facilities of CXB needs immediate overhaul in terms of service provision, training and up-gradation of facilities. So, the local population of these areas will continue to face the constraints they are currently experiencing due to insufficient health centers or clinics. The anticipated economic developments aimed at fulfilling the infrastructure gap remain unattainable. The 'No Project Option' is the least preferred from the socio-economic and environmental perspective due to the following factors:

- The socio economic and health status of the CXB district residents and FDMNs would remain unchanged specially the peoples' living in Moheshkhali and Kutubdia;
- The local skills such as planner, plumbing and construction would remain under-utilized as no employment opportunities will be created for local population who would have otherwise worked at the project area;
- Reduced health and economic state due to current status of the health facilities and provisions; and
- The ever-present and under-reported cases of GBV in the local population and the FDMN camps will not be addressed.

The Project, takes into account the baseline conditions of HNP and GBV response services and seek to improve upon the same without impacting the environment, land, air/water quality, bio diversity and small ethnic minority groups. Therefore, no immediate alternative is envisaged. The mitigation measures to deal with medical, solid and liquid wastes will be efficiently taken care of by the MWMG.

CHAPTER 6

ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES

General

This section identifies the overall risk of the project on the Environmental and Social environment and mitigation measures including Medical Waste Management in the health care centers and GBV Response services for thehost population and FDMNs.

Anticipated Environmental Adverse Impacts and Mitigation Measures

Ground Water/Drinking Water Pollution

Impact. The water table in this area is depleting due to extraction of GW for drinking, bathing, cooking as well as irrigation purposes. However, since the civil work is minimal, basicallyminor renovation,not much quantities of groundwater will be required for construction.

Mitigation. The contractor will make arrangement for water required for construction in such a way that the water availability and supply to nearby communities remain unaffected. The Contractor will be required to treat wastewater before discharging the same in to any stream or natural water bodies.

Air Pollution

Impact. There is no densely populated houses as well as industries, brick field etc. located closely to the Project sites. So, the air pollution cannot cause severely negative impacts on surrounding areas. Air quality may be affected for short duration in and around the construction sites due to various construction activities and construction vehicular movement.

Mitigation. In order to keep the pollution level within acceptable limit, construction related emissions should be regulated. Regular water spray on dusty surfaces during dry season to reduce dust generation must be practiced. Vehicular pollution check shall also be made mandatory.

Noise and Vibration

Impact. Since the construction requirement is minimal for the Project (minor renovation and refurbishment), the noise level expected will not be significant.

Mitigation. The noise pollution is not expected to exceed the maximum threshold. But the Contractors should take measures not to create unnecessary noise due to vehicle movement, loading and unloading and practice precautionary measures to deter excess noise.

Solid and Medical Waste

Impact. There will be an average of 700-800 patients, staffsand attendants around Sadarhospital daily, in Upazila level the number is around 300-400 and in FWCs and CCs the number is 80-120 and 50-60 respectively. Thus the solid and medical waste generated will create environmental and health hazards in the building premises if not managed properly. Improper management of solid wastes may lead to soil and ground water contamination through the generation of leachate. Food waste of the resident patients cause bad odor and due to non-removal of waste regularly will also cause unhealthy conditions in the building premises. Medical waste will not only cause degradation of the soil, ground water and air quality but also has the potential to spread diseases. The health-care workers, patients, waste handlers, waste-pickers and general population may be exposed to health risks from infectious waste, chemicals and other special medical waste.

Mitigation. A Medical Waste Management Guidelines(MWMG), Solid and Liquid Waste Management Planhave been developed (**Annex Band C**) for the implementation stage, which should be followed by all tiers of health facilities. Further a Screening guideline for health facilities has also been developed as well (**Annex D**) which may also be referred to while screening various health facilities on ground.

Anticipated Social Adverse Impacts and Mitigation Measures

Land Acquisition and Loss of Structures

Impact. The project will not require any land acquisition. No squatters have been found to be adversely affected due to Project activities. ThisESA has assessed such effects.

Mitigation. Accordingly, the likelihood of preparation of any resettlement instrument is not envisaged. However, if such plans are required at a later stage, these will be prepared and implemented in a manner acceptable to the Bank.

Effect on Small Ethnic Communities

Impact. CXB district has a small number of ethnic and religious minority community living in the area. The ethnic minority communities in the project sub-districts have been identified through extensive consultation while the ESA was conducted. The Project will not affect them adversely.

Mitigation. Since the Project is not envisaged to affect the ethnic communities adversely no IPP is required to be prepared. However, in an unlikely event during project execution if any of these ethnic people are affected appropriate consultation, agreement/ consent will be taken

being fully cognizant of socio cultural and religious sensitivity.

Occupational Health and Safety

Impact. Medical staffs including waste handlers will be exposed to medical, solid and liquid wastes. Further construction workers will face occupational health hazards such as minor or major injuries due to lack of general safety requirements and precautions applicable for such sites, malfunctioning equipment, careless use of equipment and vehicles, etc. Poorly designed temporary camp and sanitation facilities may pose a health threat and nuisance to the workers and local populace.

Mitigation. An Occupational Health and Safety Plan (OHSP) to be prepared to avoid health hazard of the staffs, patients and workers. First Aid Box and Personnel Protective Equipment (PPE) such as ear plugs, safety belts (for working at height), helmets, hand gloves, safety shoes, gumboots and goggles are provided for the workers on construction site. The MWMP will also be executed during the Project period and beyond. Adequate training and awareness raising sessions for the waste handlers and medical staffs will be planned and provided, which has already been mentioned in MWMG.

Gender Based Violence (GBV)

Impact. The project will provide GBV response services to the host population and the FDMNs. There are gaps in the number of occurrence and the reportage due to various social stigma. Further, the project will also employ workers, though at a limited scale, for renovation, reconstruction purpose. This may also give rise to potential GBV cases.

Mitigation.GBV Action Plan will be submitted for the Bank's approval before the preparation of the procurement documents. Once approved, the GBV Action Plan is implemented throughout Project implementation.This should cover awareness raising, especially among workers and staffs, disseminating information to the populace and a specific GRM procedure circulated and understood by those concerned.

CHAPTER 7

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

General

ESMP is one of the important tools of the implementing the mitigation plan for the proposed Project. The plan provides guidance regarding environmental and social issues/parameters, location, frequency and means of management and mitigation.

An Environmental and Social Management Plan (ESMP) has been prepared and appended below as a Table) along with this ESA for the execution as a means to mitigate or minimize the adverse impacts associated with operational activities of the project on the natural and social environments.

Objectives

The goal of this management plan is to compare the monitored data against the baseline condition collected during the study period to assess the effectiveness of the mitigation measures and the protection of the environment and social conditions based on agreed standards. The main objective of ESMP is ***to manage environmental and social risk and impacts based on mitigation hierarchy***. In this connection following will be implemented:

a. Monitor the actual impact of the Project on environmental and socioeconomic receptors;
b. Implement mitigation measures for any unexpected impact or where the impact level exceeds that anticipated in theESA;
c. Ensure compliance with legal and community obligations including safety on construction sites;
d. Plan and ensure the safe disposal of medical, solid and liquid waste as per MWMGand Solid and Liquid Waste Management Plan as well as excess construction materials;
e. Appraise the adequacy of the ESA with respect to the project's predicted long-term impacts on environmental and socio-economic environment;
f. Evaluate the effectiveness of the mitigation measures proposed in the ESMP and recommend improvements, if and when necessary;
g. Compile periodic accident data to support analyses that will help minimize future risks;

Table 11.Environmental and Social Management Plan (ESMP)

Expected Impacts	Project Stage	Mitigation Measures	Responsibility
Dust and air pollution from flying of dried up earth generated from re-sectioning work	Implementation	• Regular water sprinkling arrangement on de-silted material specially during hot-summer season to maintain soil moisture and minimise dust pollution; • Quarterly air quality monitoring shall be carried out at the Sensitive locations. • The materials should be covered while transporting.	Contractor
Noise pollution & vibration and its impact on workers and community health (especially patients)	Implementation	• The specific site should be covered to restrict the noise. • Heavy noise emitting equipment shall be fitted with silencer. Noise barrier shall be provided to generator set. • Reducing the noise produced from a vibrating machine by vibration damping i.e. making a layer of damping material (rubber, neoprene, cork or plastic) beneath the machine. • Workers shall be provided with PPEs (earmuff) to minimise health impact due to noise pollution	Contractor
Water and land pollution due to debris from dismantling structures and spoil	Implementation	• Reuse of dismantled materials to the possible extent; • All types of wastes shall be disposed-off in the nearby sanitary landfill site.	Contractor
Medical Waste Pollution due to unplanned facilities	Operation	• Worker involved in waste management and maintaining the sub-project may get sick if not trained/awareness adequately • The wastes generated from the medical facilities on regular basis	
Solid and Liquid Waste Pollution due to unplanned facilities	Implementation & Operation	• The wastes should be collected separately in the coloured bin and then should follow the waste management plan • The workers should be instructed to dump their food wastes in the bin • The workers should be provided with necessary panned sanitary latrines to avoid further pollution	Implementing Agency and Contractor
Land Acquisition and Squatters	Implementation	• No land acquisition is required for the Project and no squatters have been located who might be adversely affected by the Project activities.	Implementing Agency
Small Ethic Communities	Implementation	• CXB district has few small ethnic and religious minority community.The project will not affect these people therefore IPP may not be required. However, in an unlikely event during project execution if any of these ethnic people are affected appropriate consultation, agreement/ consent will be taken being fully cognizant of socio cultural and religious sensitivity.	Implementing Agency

Expected Impacts	Project Stage	Mitigation Measures	Responsibility
Gender Based Violence	Implementation	• A stand-alone GBV Action Plan will be prepared, adopted, and implemented and a GBV specific Grievance Redress Mechanism (GRM) will be operated to manage the risks of GBV and Sexual Exploitation and Abuse (SEA) based on GBV risk rating of this project (this project has been categorized as a "low" risk project with regards to GBV risks caused and/or contributed by the project activities).	Implementing Agency
Biodiversity and Cultural heritage	Implementation	• The Project will not adversely affect the biodiversity and cultural heritage of the Project area. . However, a chance find procedure will be included in works contracts requiring contractors to stop construction if cultural heritage is encountered during any work and to notify and closely coordinate with relevant mandated country authority for the salvaging and restoration of such cultural heritage.	Implementing Agency and Contractor

CHAPTER 8

ENVIRONMENTAL AND SOCIAL MANAGEMENT BUDGET

Budget

Monitoring the implementation of the Environmental and Social Management Plan is the responsibility of IA. The cost estimation for environmental and social mitigation measures, management and monitoring is given in the following Tables:

Table 12: Environmental and Social Management Budget

Ser	Mitigation and Monitoring Items	Unit	Cost/Unit	Total Unit	Total Cost
	Mitigation				
1	Facilities Development for medical, solid and liquidWaste Management guidelines and plan	3,000,000/UzHC			21,000,000
2	Community Health and Safety (Sign/Marking)	Lump-sum			100,000
3	Post-construction Clean-up	Lump-sum			150,000
4	Tree Plantation	No.	50	1000	50,000
	Monitoring				
5	ESMP Implementation Training	No.	50000	1	50,000
6	Drinking Water Quality Test	No.	20000	8 Upazila	160,000
7	GBV monitoring and response	Lump-sum			800,000
	Grand Total				**22,310,000**

Table 13. Remuneration of Expert (*All Located at Project Area*)

Sl. No.	Type of Expert	No.	Man-Month	Unit Cost	Total Cost
1	Environmental Specialist	1	12	200,000	2,400,000
2	Social Development Specialist	1	12	200,000	2,400,000
3	Gender Specialist	1	12	200,000	2,400,000
Grand Total					**7,200,000**

Table 14.Summary of the Total Budget

Sl. No.	Item	
1	Environmental and Social Management Cost	22,310,000
2	Remuneration of Expert	7,200,000
	TOTAL	**29,510,000**

CHAPTER 9

GRIEVANCE REDRESS MECHANISM (GRM)

General

GRM is a complaint and proposal consideration mechanism that provides an accessible channel for submission of complaints and feedback to individuals and communities, if they suppose that at the Project activities/ personnel have or may have adverse consequences for them. GRM allows to improve the response efficiency and accountability level to the project beneficiaries, ensuring the prompt complaints and feedback consideration and processing, as well as problems identification and finding their solutions together with the stakeholders.By increasing transparency and accountability, GRM seeks to reduce the project risk that unintentionally adversely affects citizens/beneficiaries and serves as an important feedback mechanism that can help to improve the project impact. This chapter provides a GRM protocol to be implemented, disseminated, followed and monitored.

Objectives

The objectives of the GRM are to:

a. Provide a transparent process for timely identification and resolution of issues affecting the project and people, including issues related to the environmental and social impact, resettlement and compensation program, when triggered;
b. Strengthen accountability to beneficiaries, including project-affected people;
c. Addressing of HNP and GBV services related complaints, including sexual harassment/abuse by Project workers and staffs;
d. Address complaints on labor engagement and other related issues

HGSP Project Related GRM

The GRM will be accessible to all internal and external, including affected people, community members, civil society, media, vulnerable people and other interested parties. External stakeholders including international and regional can use the GRM to submit complaints, feedback, queries, suggestions, or even compliments related to the overall management and implementation of the Project. The GRM is intended to address issues and complaints in an efficient, timely, and cost-effective manner.

A Grievance Redress Committees (GRCs) will be established at three levels: (i) community level (ii) District level, and (iii) IA Level. At the community level GRCs, local people's representation including inclusion of women representative has to be confirmed. Following is the structure of the GRCs:

Table 15.Grievance Redress Committee(GRC) at Various Levels

Level	Members of the GRC at different levels
Project Level At IA	Project Director – Convener Chief Implementation Officer- Secretary SocialDevelopment Specialist - Member External Monitor-Member Representative of DG WA- member – on GBV matters
District Level	Project Officer at the Civil Surgeon's Office–Convener Consultation and Communication Specialist - Secretary Social Development Specialist- Member Representative of DD WA –member for GBV related cases Representative of the Affected people – Member Woman representative of affected people in case of women aggrieved persons- Member Representative from the local NGO working on GBV matters in the locality - Member
Community Level (Upazila/Union/CC)	Upazila Health and Family Planning Officer (UH&FPO) at UzHC level - Convener Elected Chairman of the Union at Union and CC level– Convener Representative of the Implementing Consulting firm- Member Secretary Representative from concerned LGI- Member Assistant Consultation and Communication expert-Member Representative of the affected people – Member Woman representative of affected people in case of women aggrieved persons- Member Representative from the local NGO working on Gender and GBV related matters - Member

Steps of Successful GRM Implementation

The following steps will be followed for the successful implementation of GRM.

Complainants informed of the proposed resolution in person. Data on grievances and/or original grievance logs will be made available to World Bank missions on request, and summaries of grievances and resolutions will be included in periodic reports to the World Bank.

Within seven (7) days of submission; complainant will be informed on the likely course of action and the anticipated timeframe for resolution. If complaints are not resolved within 15 days, the responsible person will provide an update about the status of the complaint/question to the complainant and again provide an estimate of how long it will take to resolve the issue.

Gathering information about the grievance and verifying validity.The process can include site visits, document reviews, a meeting with the complainant and meetings with others who can otherwise help resolve the issue. It is expected that many or most grievances would be resolved at this stage.

Complaints and feedback will be compiled by the Secretary in each level and recorded in a register. He or she will place the grievances to the committee and the complained person with the goal to resolve complaints within 15 days of receipt.

Project stakeholders will be able to provide feedback and report/record complaints through several channels: in person at offices (DSH/UHC/UHFWC/CC), Complaint Box located at the project sites, and to the Convener by mail, telephone, and email.

If someone is not satisfied with the resolution at the first or second tiers, he or she may request it be elevated to the next tier. If they are not satisfied with the ultimate resolution, they may pursue legal remedies in court or pursue other avenues. Throughout the entire process, IA at the Project Level will maintain detailed record of all deliberations, investigations, findings, and actions, and will maintain a summary log that tracks the overall process.

Grievance Logs

The GRC will maintain a grievance log which will include at least the following information:

a. Individual Reference Number
b. Name of the person submitting the complaint, question, or other feedback, address and/or contact information (unless the complaint has been submitted anonymously)
c. Details of the complaint, feedback, or question/her location and details of his / her complaint.
d. Date of the complaint.
e. Name of person assigned to deal with the complaint (acknowledge to the complainant, investigate, propose resolutions, etc.)
f. Details of proposed resolution, including person(s) who will be responsible for authorizing and implementing any corrective actions that are part of the proposed resolution
g. Date when proposed resolution was communicated to the complainant (unless anonymous)
h. Date when the complainant acknowledged, in writing if possible, being informed of the proposed resolution
i. Details of whether the complainant was satisfied with the resolution, and whether the complaint can be closed out
j. If necessary, details of GRC1 and GRC2 referrals, activities, and decisions
k. Date when the resolution is implemented (if any).

Points of Contact

All tiers of the GRM will have a dedicated point of contact for recording project related complaints (including GBV related complaints) and passing those to the GRC for necessary action at their end. GRM should be user friendly and easily approachable, particularly by the physically and mentally disabled, marginalized and the vulnerable groups including the elderly ones in the Host Community. Similar mechanism has to be evolved for the FDMN at the camps.The Toll-free Number for receiving complaints will have operators round the clock who can speak in local dialect so that the complainants from the Host Community feel at ease while communicating.

World Bank Grievance Redress System

Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may also complaints directly to the Bank through the Bank's Grievance Redress Service (GRS) (http://projects-beta.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service). A complaint can be submitted to the Bank GRS through the following channels:

- By email: grievances@worldbank.org
- By fax: +1.202.614.7313
- By mail: The World Bank, Grievance Redress Service, MSN MC10-1018, 1818 H Street Northwest, Washington, DC 20433, USA

CHAPTER 10

INSTITUTIONAL ARRANGEMENTS

General

Implementation of the proposed project will be the responsibility of the MOHFW through its existing structures, and in close coordination with MOWCA.The coordination and monitoring will take place through various committees at the central, divisional, district and upazila levels for implementation of the interventions for both the host population and FDMN. Due to the exceptional circumstances in CXB, some selected interventions will be contracted to UN Agencies to complement their implementation.

Responsible Institutes and Their Tentative Roles

Ministry of Health and Family Welfare (MOHFW)

The MOHFW will lead the project. They will oversee the whole project with their IA and and also coordinate with other support service providers.

Ministry of Women and Children Affairs (MOWCA)

MOWCA will provide coordinating service, expertise and support the services of the One-Stop Crisis Center and Cell.

Directorate General of Health Services (DGHS) and Directorate General of Family Planning (DGFP)

Directorate General of Health Services (DGHS) and Directorate General of Family Planning (DGFP) will be responsible for the effective implementation of the Project including execution of the environmental and social management plan. They will engage the services of ***Environmental Specialist, Social Development Specialist*** and ***Gender Specialist*** to coordinate and oversee the implementation of the environmental and social issues.Their main responsibilities will be:

a. Oversee implementation of the ESMP of the project;
b. Supervision and monitoring of the progress of activities for implementation of different components of the ESMP;
c. Evaluation of Project environmental and social impacts and modifications of the ESMP as necessary for adaptation/changes during the project implementation;
d. Preparation of quarterly progress reports for submission to IA; and

e. Maintain liaison with other government, semi-government and non-government organizations, research institutes in the country on the matters of mutual interest related to environmental and social issues.

Capacity Assessment

At the present the Ministry of Health and Family Welfare (MOHFW)'s doesn't have a dedicated Environmental and Social Team/ Unit to implement/oversee/ the recommendations/ mitigation measures illustrated in this ESA. Recommendations have been made to include **Environmental Specialists (ES), Social Development Specialist (ES)** and a **Gender Specialist (GS)**. Further training of field staffs (Medical Staffs, waste handlers etc) of MOHFW and the GBV staff of MOWCA as well as the awareness sessions for stakeholders will also be carried out.

CHAPTER 11

PUBLIC CONSULTATION AND DISCLOSURE

General

Public consultation and disclosure is an important tool for ensuring transparency, accountability and effectiveness of development projects. The resultant Stakeholder Engagement Plan (**SEP**) lays out a stakeholder engagement strategy for engaging stakeholders associated with HGSP. TheSEP has already been is prepared. The coordination and monitoring mechanism depicted in the SEP consist of committees, with the participation of focal persons from MOHFW and MOWCA and other related agencies at the central, divisional, district and upazila levels.

A number of stakeholder meetings were carried out (Photographs and description at **Annex E**) to construct the SEP the salient points of which are appended below:

- There are acute shortage of Doctors, Nurses, and technicians at DSH, UHCs and UH&FWC. Shortage of equipment and required medicine in all 4 tiers of HNP service providers; the shortfall of medicine is more at the CCs. The infrastructure of the HNP Service Providers including family accommodations need repair, renovation.Provisions like running water and electricity is extremely short in first tier health facilities. Most of the CCs have no perimeter fencing/wall and remain exposed to security threats
- Acute shortage of trained Midwives, Anesthetists at UHC and UH&FWCs. As such, complicated child birth cases are referred to DSH despite having all infrastructural facilities and equipment
- There is a critical need of establishing OCC Cells at the Kutubdia and Moheshkhali UHCs as these are separated from the mainland and far off from the DSH. All GBV cases are referred to the OCC at DSH. At some of the UHCs, clinical management is done before referring to OCC at DSH. However, legal matters are only addressed at the OCC
- There are more women and adolescent girls in the FDMN community as many of the adult men were killed while escaping the atrocities in Myanmar. As such many a widow are getting married to already married men and polygamy is very much evident in the camps. This is one of the major causes of GBV in the camps. Sometimes, NGO and security staffs are abusing their authority and getting involved in GBV cases. A holistic approach should be taken at the camps to arrest and protect women, adolescent girls, minor boys and girls from GBV.Arresting GBV related cases

demand awareness from the grass root level. Family is the nucleus and family values need to be rekindled.

- OCC staffs, teacher, students, health assistant, family planning officers and other professionals having been exposed to new OCCs training module to combat Violence Against Women (VAW) could be effectively used in educating the society at large.
- At the FDMN Camps, UNICEF and IOM are addressing and providing human resources for healthcare; while UNFPA is addressing the issue of Reproductive Health amongst the FDMN camps with required manpower and material support.
- About the reproductive health and choice of methods, both husband and wife need to be consulted; it must be informed decision by the couple. It is noted that for effective birth control implants are popular among the FDMN women while they despise IUD. They also fear that it would be unholy if one dies with IUD and buried without removing the device.
- There is many an entry point to reach the FDMN. This includes WFS, medical facilities at the camps, where women assemble for various NGO/INGO supported events etc. UNFPA has newly added 18 WFS. These need to be run in a sustainable way. CARE representative insisted on assisting WFS not covered by any funding.
- Multi-purpose health volunteers, who include religious leaders, majhi and other community leaders, will be integrated in the IEC project.

For an in-depth review and analyses of the public consultation and disclosure, the HGSP SEP is hereby referred.

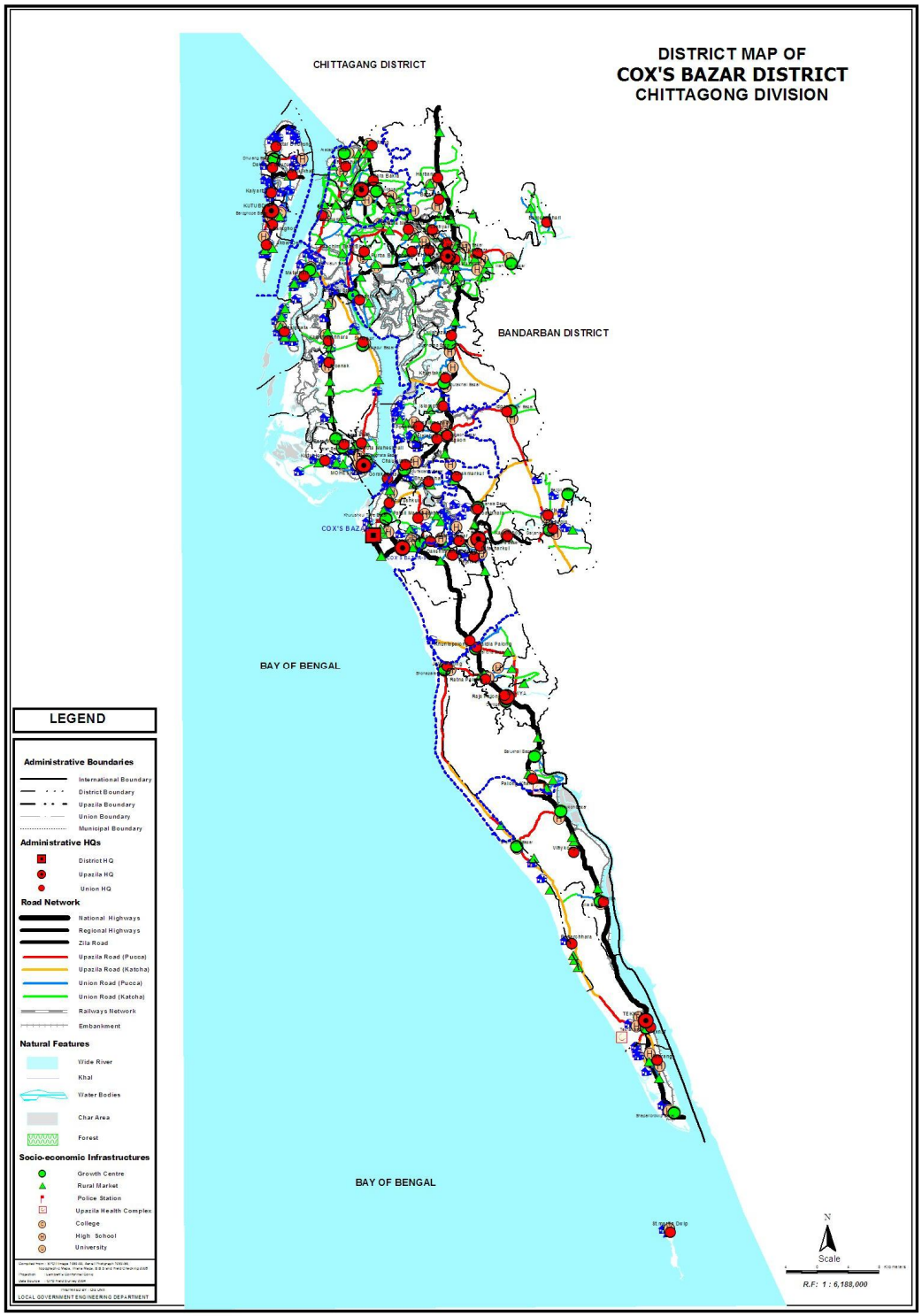
Annex A

BASIC INFORMATION OF CXB DISTRICT

Profile	CXBthana was established in 1854 and CXB Subdivision was formed comprising of CXBsadar, Chakoria, Maheskhali and Teknafthanas. Afterwards three new thanas were constituted under this subdivision such as Ukhia, Kutubdia and Ramu. Under the decentralization scheme the thanas were transformed into upazilas and the CXB subdivision was elevated to a district in 1984. It consists of 8upazilas, 3 municipalities, 27 wards, 58 mahallas, 67 union parishads, 199 mouzas and 975 villages
Location	CXB located in between 20°43' and 21°56' north latitudes and in between 91°50' and 92°23' east longitudes.
Boundary	It is bounded by Chattogram district on the north, Bandarban district, and Myanmar on the east, Bay of Bengal on the west and South.
Area	2491.86 Sq. km
Population	2289990
Upazila	ChakariaUpazila, Coxs Bazar SadarUpazila, KutubdiaUpazila, MaheshkhaliUpazila, RamuUpazila, TeknafUpazila, UkhiaUpazil, PekuaUpazila
Rainfall	Annual average rainfall is 3,378 mm
Maximum average temperature	In June, 39.50 Celsius
Minimum average temperature	In January, 11.80 Celsius
Annual average humidity	83 Percent
Main river	Matamuhuri, Bakkhali, Rezu, Kohelia and Naf
Main island	Moheshkhali, Kutubdia, Sonadia, Shahpari Island, Chera and St. Martin Island

Administrative Unit

Number of Upazila:	08
Number of Union:	71
Village:	992
Municipality:	CXB, Chakaria, Teknaf and Moheshkhali
Police Station:	08
Police Investigation Centre:	03
Highway Police Outpost:	05
Police Outpost:	05
Mouza:	188



CXB DISTRICT MAP

Annex B

MEDICAL WASTE MANAGEMENT GUIDELINE (MWMG)

Introduction

A pragmatic implementation of Medical Waste Management Guideline (MWMG) in the health service providers is essential to improve of Hospital environment and providing quality service. Capacity development and awareness of the service providers will be the most important aspect of Medical Waste Management (MWM). The HGSP project aims to improve the delivery and utilization of HNP and GBV response services among the host population and FDMNs of CXB. This entails provision of services through all tiers of health service providers and eventual generation of a significant amount of medical waste. Management, handling and disposal of this waste is essential. Health care waste management at the FDMN Camps at Ukhia and TeknafUpazila where some 1 million FDMN are residing is a very sensitive and touchy issue owing to huge population density and contiguous makeshift shelters. Improper handling of medical waste at the camps could have disastrous consequences if not handled effectively and efficiently in time.

Existing Legislative/Regulatory Framework of Bangladesh for MWM

The GOB's environmental laws and policies are deemed adequate for both protection and conservation of resources, although enforcement capacity needs to be improved significantly. The assessment highlights that the Program may generate medical waste and GOB has comprehensive laws and policies for management of medical waste.

a. National Environmental Policy 1992
b. Bangladesh Environmental Conservation Act (ECA), 1995 amended 2002
c. Environment Conservation Rules (ECR) 1997 amended 2003
d. Environment Court Act, 2000
e. Medical Waste (Management and Treatment) Rules 2008
f. Manual for Hospital Waste Management 2001
g. Guidelines on Infection Prevention and Control (IPC) and Biosafety 2016
h. GOB 7th 5-year Plan (FYP)
i. Environmental Assessment and Action Plan for HPNSDP, 2011-2016

World Bank Policy and Guidelines

The World Bank's Environmental, Health and Safety Guidelines (EHS)are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP) and are referred to in the World Bank's Environmental and Social Framework (**ESF**). The EHS Guidelines contain the performance levels and measures that are normally acceptable to the World Bank Group, and that are generally considered to be achievable in new facilities at reasonable costs by existing technology.World Bank requires borrowers/clients to apply the relevant levels or measures of the EHS Guidelines. When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects will be required to achieve whichever is more stringent. The EHS contains descriptive and details references and guides to use in medical facilities, especially hazardous material and waste material transport and management, biological hazards, transport of hazardous material and disease prevention all of which are applicable to medical facilities (**EHS 1.5, 1.6, 2.5, 3.5, 3.6**).

The World Banks' **Environmental, Health, and Safety Guidelines for Health Care Facilities**include information relevant to the management of EHS issues associated with health care facilities (HCF) which includes a diverse range of facilities and activities involving general hospitals and small inpatient primary care hospitals, as well as outpatient, assisted living, and hospice facilities. Ancillary facilities may include medical laboratories and research facilities, mortuary centers, and blood banks and collection services. It contains specific guides for HCF including Industry-Specific Impacts and Management, Performance Indicators and Monitoring and a number of references.

The World Bank **Environmental and Social Framework's ESS 3 (Resource Efficiency and Pollution Prevention and Management)**is triggered because due to generation of a significant amount of medical waste the Project will produce negative environmental impacts that should be prevented and mitigated.. A Medical Waste Management Guideline (MWMG) is therefore prepared as an instrument to address the effects of medical waste on the environment and human health.

Categories of Medical Waste

According to the World Health Organization (WHO) medical wastes are categorized as follows:

a. Infectious: Materials containing pathogen in sufficient quantities, that if exposed can cause diseases.

b. Sharps: Disposable needles, syringes, saw, blades, broken glasses, nails or any other item that could cause a cut.

c. Pharmaceuticals: Drugs and chemicals that return from wards, spilled, outdated, contaminated or are no longer required.

d. Radioactive: Solids, liquids and gaseous wastes contaminated with radioactive substances used in diagnosis and treatment of diseases (e.g. toxic goiter).

e. Others: Wastes from office, kitchen, room including bed linen, utensils, paper etc.

f. While the adoption of disposable sharps provides safety to health workers reducing risk from needle pricks and sharp-cuts it has caused sudden increase of the MW production and it has also created problem of plastic waste and the repacking and resale of MW such as improperly treated contaminated syringes, needles and other recyclable items used for treatment which can result in community exposure to infection such as HIV/AIDS, sepsis, hepatitis and multi-drug resistant bacteria. Proper MWM helps control of hospital acquired infections (nosocomial diseases), and negative long-term health effects like cancer, from the environmental release of toxic substances e.g. dioxin, mercury and others.

Component of Medical Waste Management

The major components of MWM includes:

- Proper waste collection and segregation at source – use of standardized color-coded bins for different wastes;
- Waste streams - general, contaminated, cytotoxic/pharmaceuticals, body parts;
- Storage and transport - cold storage for contaminated waste and body parts, transport in safe and leak proof containers;
- Waste treatment – sterilization of contaminated waste (steam autoclave), incineration of cytotoxics, pharmaceuticals and body parts in incinerator meeting relevant standards and statues.
- The hospitals (especially the large-sized) have the opportunity to take a proactive role in the community by:
- Increasing commitment to quality assurance activities to maximize patient protection against adverse outcome;
- Promoting environmental health by support for waste reduction, reuse and recycling; use of energy efficient, environment-friendly building; and greener and organic gardens.

Ongoing MWM Practice

A survey of the existing practice of medical waste disposal was carried out for the purpose of ESA. The findings are enumerated below:

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Ser	Issues of MWM	Observation
1.	Awareness and motivation on MWM	Lack of awareness among the health care professionals (in most cases) affecting understanding of proper MWM and its severe adverse impact on environment.
2.	Use of specific color coded bin	Only few health facilities have introduced use of specific color bins for segregation of MW at source and no uniformity in using specific colored bins in most of the HCFs
3.	Segregation of HCF waste at source	Not properly done in most HCFs; segregation done by sweepers need further monitoring and quality control.
4.	Management of sharps	Some cut off the nozzle of needle from syringe, some do not.
5.	Intermediate storage	Lack of availability/ use of secured intermediate storage facility for MW.
6.	Internal transport	Trolleys are not used regularly for transport of MW to outside containers.
7.	Occupational health and safety measures for workers.	Adoption of security/protective measure taken by sweepers on very few occasions. No safety conditions for workers are practiced.
8.	Transport and ultimate disposal of MW	Non-segregated MW directly dumped to public container; Segregated MW waste is dumped in closed pits at hospital premise; Segregated wastes are dumped in open pit for burning (burning is incomplete in most cases); Segregated MW are disposed in incinerator for burning, having no temperature control as required. Few HCFs follow strict code of MWM.

There is a single incinerator in CXB District which is located at the Sadar Hospital which was set up in 2019. The ***Addfield MP-500 Pathological Waste Incinerator*** is a British large pathological waste Hot Hearth incineration machine and equipped with a total of four burners and is ideal for large quantities of medical waste with a load chamber size of 1.13m³ and load capacity of 500 kg. The incinerator is CE Certified to BS EN746-2, 1997 and meets emission standards. There are 5 trained operators who operate this machine. The machine is also properly operated and maintained. At the moment the machine is used for two shifts with 250 kg load in average per shift.

Status of Biomedical Waste Management System in Cox's Bazar District

The current status of the Bio-medical waste management in the public health facilities in Cox's Bazar district has been surveyed. A total of 7 facilities including 1 District Sadar Hospital, 3 UzHCs, 2 Family Welfare Centers and 1 Community Clinic were surveyed across for this exercise.

Segregation and Collection of Waste

The primary study conducted across the district and public health care facilities suggests segregation and collection of medical waste practices is as per norms in District Sadar Hospital (DSH) and lack marginally in Upazila Health Complexes (UHCs). However, it lacks substantially in Family Welfare Centers (FWCs) and Community Clinic (CC). While treatment of liquid waste before discharge is certainly a concern across different types of facilities, there are reported incidence of mixing of bio-medical waste into other wastes. Table 3.5 below presents the availability of equipment and consumables and practices of segregation in different types of health facilities.

Table:Current Practice of Bio-medical Waste Segregation and Collection in Project Area

Sl. No.	Indicators	DSH	UHC	FWC	CC	Total
1	Segregation Being Done	100%	70%	50%	-	55%
2	Containers/ Bins Available	100%	100%	100%	100%	100%
3	Color coded containers as per BMWM rules 2016	100%	75%	50%*	25%*	62.5%
4	Needle destroyers available	100%	-	-	-	25%
5	BMW mixed with other waste	-	25%	100%	100%	56.25%
6	Is liquid waste being treated before discharge into sewers	100%	-	-	-	25%
Total		**1**	**3**	**2**	**1**	**7**
Source: Primary Study, September 2019						

****use one single colored container only***

Storage and Transportation of Bio-medical Waste

While the record of waste generated is kept on daily basis at district hospital, the same is not true for other type of health care facilities (HCFs). Table below presents the current practices of storage and transportation of BMW in different type of HCFs.

Table:Storage and Transportation of BMW in HCFs

Sl. No.	Indicators	DSH	UHS	FWC	CC	Total
1	Is any waste being stored at the facility for more than 48 hours	-	-	-	-	-
2	Record of every day's waste generation available	100%	70%	-	-	42.5%
3	Proper storage and internal and external transport facility available	100%	70%	-	-	42.5%
4	Vehicle carrying BMW is authorized for such specialized work	-	30%	-	-	7.5%
5	HCF have policy on the waste type, collection time and weighing of waste	100%	100%	-	-	50%
Total Sample		**1**	**3**	**2**	**1**	**7**
Source: Primary Study, September 2019						

Current Practice of Infection Management in AP

Overall the infection control measures are in place in each of the health care facilities with mechanism for decontamination, hand washing, use of personal protective equipment's, and handing of sharps. These practices vary from different tiers of HCFs. While only the District hospital perform better on these indicators, the other health facilities require further strengthening on these areas.

Table:Current Practice of Infection Management in Project Area

Sl. No.	Questions	DSH	UHS	FWC	CC	Total
Decontamination of Instruments						
1	*Is sterilizer available*	100%	-	-	-	25%

Sl. No.	Questions	DSH	UHS	FWC	CC	Total
2	*Is it in good working condition*	100%	-	-	-	25%
3	*Are instruments rust free*	100%				25%
Handling of Sharp Wastes						
4	*Is puncture proof container available*	100%	70%	50%	-	55%
5	*Are sharps peeping out/ lying outside of containers*	-	100%	50%	-	37.5%
6	*Is needle cutter available*	100%	-	-	-	25%
7	*Is it in good working condition*	100%	-	-	-	25%
Hand washing practices						
8	*Is liquid soap and clean water available*	100%	70%	50%	100%	80%
9	*Is paper towel/ clean towel available*	100%	-	-	-	25%
10	*Is staff aware of hand washing practices*	100%	100%	100%	100%	100%
11	*Are staff members washing their hands Properly*	100%	100%	100%	100%	100%
12	*Are list of universal precautions available*	100%	-	-	-	-
Total Sample		**1**	**3**	**2**	**1**	**7**
Source: Primary Study, September 2019						

Worker's Health and Safety

The practice of worker's health and safety (WHS) measures are reported to be relatively better in at District Hospital and Area Hospitals and reduces with hierarchy of the HCFs in project area. Table below presents the status of various indicators on WHS across different type of HCFs in project area.

Table:Worker's Health and Safety

Sl. No.	Indicators	DSH	UHS	FWC	CC	Total
Use of Personal Protective Equipment						
1	*Is PPE (gloves, apron, mask etc.) available*	100%	-	-	-	25%
2	*Are staff trained on how to use and dispose of this equipment*	100%	-	-	-	25%
3	*Do employees wear protective equipment (PPE) while on the job*	100%	-	-	-	25%
4	*Is there any incidence of occupational injury/ accident*	**-**	**-**	**-**	**-**	**-**
5	*Is the record of such injury/ accident with sufficient details available*	**-**	**-**	**-**	**-**	**-**
Training on BMW Management						
6	*Is the BMWM training manual for staff Available*	**-**	**-**	**-**	**-**	**-**
7	*Is the record of employees training Available*	**-**	**-**	**-**	**-**	**-**
Health Safety						
8	*Is the medical record of waste handlers available*	100%	-	-	-	25%
9	*Health check-up of all the employees (at least once in a year)*	100%	-	-	-	25%

Sl. No.	Indicators	DSH	UHS	FWC	CC	Total
10	*Are all staff of HCF and those handling BMW is immunized (against the Hepatitis B and Tetanus)*	-	-	-	-	-
Total Sample		**1**	**3**	**2**	**1**	**7**

Gaps and Challenges in Implementation of MWMG

There has not been significant or widespread improvement in MWM implementation since the Rule was promulgated. The primary reasons are as follows:

- Low awareness and capacity in the health facilities
- Inadequate legal provisions
- Lack of sufficient expertise and ***training***on the issue
- Resource constraints.
- Inter-ministerial coordination and cooperation
- Insufficient supervision and monitoring

Lack of manpower and training, lack of coordination, lack of required fund are the main reasons for delay in the implementation of proper MWM in CXB.Implementation of proper MWM requires both investments in equipment and on human resources (employees and staff) for building their capacity in managing MWM activities. Achieving improved performance on a sustainable basis also demands investments in creating appropriate systems and frameworks.

Additional Challenges for MWM due to influx of FDMNs

Due to the influx of FDMNs, temporary camps have been set up in various locations within the settlement to provide healthcare services. Their locations are not fixed and there is limited access in and out of the camps. Currently a number NGOs and international organizations are involved in the provision of healthcare service through static and mobile health care facilities scattered across all camps of the settlement areas. There is very limited space within the camps for a separate infrastructure for medical waste management on-site. The staff at all levels have very limited knowledge of medical waste management, waste segregation at service delivery point is rarely done. There is minimal monitoring of correct waste disposal even in those facilities which have the ability to segregate waste. Often chemical disinfection is practiced exposing the healthcare workers to toxic chemicals risk. Often open burning is practiced which exposes the surrounding people to air pollution. Probability of installing an incinerator is not feasible due to lack of space, energy requirement and dedicated manpower.

In UzHC, there is already lack of physical infrastructure to manage waste safely within the facility. The influx of FDMNs has resulted in a surge of patients in these facilities of CXB. This has been compounded by the extensive vaccination campaigns which have increased the quantity of glass and sharps waste that the facility has to manage. The Concerns regarding medical waste management at health care facilities in FDMNcamps are the following:

a. Incorrectly managed medical waste, including sharps, are now visible on the ground or are just below the ground surface in areas within the camps in public areas
b. Sharps have been burnt inappropriately and remnants of sharps broken vaccine vials, are visible on the ground close to some health care centers
c. Waste is not always being sorted appropriately which can result in excess quantities of infectious waste and non-infectious waste being processed together.
d. Low temperature burning of waste can result in hazardous by products. The smoke from burning of both infectious and non-infectious waste can contribute to disease in the FDMN population via inhalation of irritants and carcinogenic dioxins.
e. Correct management of medical waste by many of the health care facilities within the camps may not currently be possible due to a lack of waste management infrastructure.
f. Managing infectious medical waste at each health facility will not be sustainable as, there are now approximately one million FDMNs living within the camps and finding suitable space for burying waste ash will become increasingly problematic over time.

Measures to Improve MWM

Basic environmental management practice for the health-care sector includes efficient infection control measures, adequate water supply and sanitation, occupational health and safety of staff, and proper disposal of infectious wastes and wastewater.The measures to improve MWM in CXB health facilities are:

Table.Overall Measures to improve MWM in CXB

Issues	Measures to improve MWM
Strengthen policy and legal framework	Under the existing regulatory framework, the health facilities that generate medical are not sufficiently held accountable for proper handling and managing of medical waste. At the upazila level, the health facilities can be made more accountable by ensuring proper record-keeping, assigning a focal person for supervision of medical waste management (MWM) activities, and constructing burial pits for sharps and infectious

Issues	Measures to improve MWM
	wastes. Construction and operation of deep burial pits should follow the guidelines described later.
Strengthen institutional capacity and compliance	Improve health care waste management, particularly focused on the UzHC and below, by ensuring: • use of color-coded bins in health facilities in accordance with Medical Waste Management Rules 2008; • segregation of waste in all facilities by using the established color coding system and recordkeeping of medical waste generated; • storage of waste in designated temporary storage areas before disposal; • destruction of sharps before its final disposal in in-house deep-burial pits as per existing HCWM guidelines; • availability and visibility of information, education and communication materials on health care waste management in health facilities and • using the Environmental Specialist to help the project set up the MWMP/MWMG and to train project staff and health care facilities.
Strengthening implementation	• Monitoring and reporting on the implementation of MWM, particularly focused on the UzHC and below. • Capacity building for health workers on MWM***through comprehensive trainingand awareness raising***, particularly focused on the UzHC and below. Appropriate capacity enhancement **training** on infection control as well as management of sharps will be conducted for the relevant staff of health care facilities. • Standard Operating Procedures (SOPs) to be finalized and promoted extensively among all health care facilities for ensuring safe disposal as well safety of workers handling wastes. • Appropriate ***training program*** will be initiated on Occupational Health and Safety protocols for all employees involved in handling of "in-house" and out-house MWM needs to be developed with an effective monitoring mechanism.

Measures to improve MWM in FDMN Camps and Cox's Bazar UzHC

Sparsely located FDMN health camps and the UzHCs in CXB will face challenges regarding MWM due to the influx of FDMNs. Some measures to improve MWM are the following:

Table 5: Measures to improve MWM for the FDMNand UzHCs

Issues	Measures to improve MWM
MWM in temporary camps	Since installing MWM infrastructure and its maintenance will be challenging in this setting, a short term measure could be to contract out to third party for safe final disposal of medical waste. This will have to be integrated with provision of color coded bins, collection points and an extensive training and monitoring exercise for the personnel associated with health service delivery.
MWM in CXB UHCs	• Construct deep burial pits for permanent disposal of sharps and hazardous solid waste. This measure will be helpful in the long run as there will no longer be a requirement to store the MWM in designated bags to be shipped out to district level

Issues	Measures to improve MWM
	hospitals where incinerators are available. If space is available on site then final treatment and disposal on site may be more realistic as this is a permanently located facility. • Monitoring and safety measures of deep burial pits should be in place. This includes: o Monitoring and regular reporting of groundwater quality around the burial pits. Suggested parameters for monitoring are: Total and Fecal coliform, pH, Fe, Mn, As, heavy metals, Total Dissolved Solids o Ensure that proper precautionary signage in place at the location near and around the burial pits o Ensure that the burial pit is constructed with proper impermeable lining materials at the sides and bottom • All other measures mentioned in the previous section.

Addressing Medical Waste Management at Health Facilities

Stage 1: Collecting & Segregating

The biomedical waste has to be collected in containers that are resilient and strong from breakage during the handling process. Do not place sharps, used needles, syringes, or other contaminated tools in common waste disposal or recycle bin because the entire waste will be infectious by doing so. The segregation also needs to be performed between the liquid and solid biomedical waste products. Categorizing the medical waste with correct segregation to isolate and manage each waste in the proper way. For this purpose, the segregations come in colored waste containers, label coding and plastic bags. The simplest way to identify the different types of waste is to collect the various types of waste in separate containers or plastic bags that are color-coded and/or marked with a symbol.

Stage 2: Storing & Transporting

Specific requirements for storage facilities, such as a secure area that is inaccessible to the general public, as well as separated it from areas for food consumption. The storage facilities also have to be accompanied with refrigerator or freezer unit that can be used with medical waste if necessary. Some facilities even provided special vehicles and protective devices to dispose, handling or transport the biomedical waste products. Remember to observe and keep maintaining the protective devices periodically so it won't be a source of transmitting the infections.

Stage 3: Treatment of Medical Waste

Deep Burial Pit

Design Aspects of Sharps Disposal Pit

Since sharps are usually the main cause of concern, and make up only a small quantity of the total health care waste, they may be appropriately disposed of on-site. The remaining waste may be sent to the municipal (or common) disposal site. A system that may be used in small health care centres is described below.

A circular or rectangular pit is dug and lined with brick, masonry or concrete rings or any other impermeable material. The pit is covered with a heavy concrete slab that is with an internal diameter of about 200mm. Needles and scalpel blades (without the syringe body or drip tubing) are dropped into the pit through the steel pipe. When the pit is full it can be sealed permanently after another has been prepared. Advantages of such pits are that these discourage recycling of sharps by scavengers due to their inaccessibility. The height of the pipe discourages children from dropping soil or stones into the pit filling it up prematurely.

The Specification for a Waste Burial Pit

The specification for a waste burial pit is provided below.

a. A pit or trench should be dug about 2 meters deep. It should be half-filled with waste, and then covered with lime up to 50 cm of the surface, before filling the rest of the pit with soil.
b. Animals should not have any access to the waste burial sites. Covers of galvanized iron/wire meshes may be used to protect the area from trespassing. There should be adequate safety precautionary signage around the burial pit
c. On each occasion, when wastes are added to the pit, a layer of 10 cm of soil shall be added to cover the wastes.
d. Waste disposal into the pits should be performed under close and dedicated supervision.
e. The deep burial site should be relatively impermeable and no shallow well should be close to the site;
f. The pits should be distant from habitation, and sited so as to ensure that no contamination occurs of any surface water or ground water. The area should not be

prone to flooding or erosion. Regular groundwater monitoring around the burial pit area should be conducted.

g. The location of the deep burial site should be authorized by the prescribed authority
h. The institution should maintain a record of the kind of waste sent for deep burial.
i. A permanent Record of the size and location of all burial pits needs to be strictly maintained and displayed at strategic place with due precautions to prevent construction workers, builders and other from digging in those areas in the future

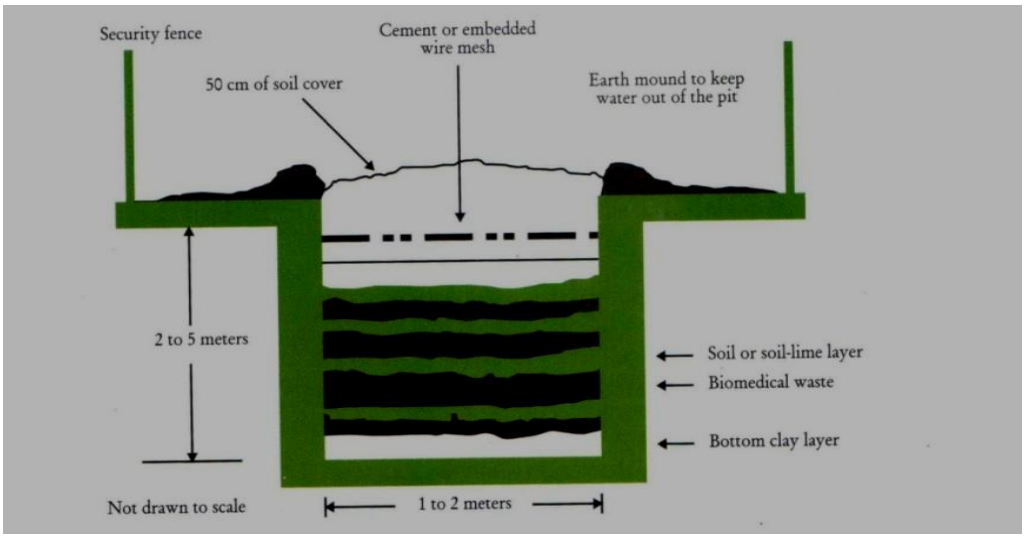


Fig. Layout and Specification of Burial Pit

Annex C

SOLID AND LIQUID WASTE MANAGEMENT PLAN

SOLID WASTE MANAGEMENT

Introduction

Services provided in healthcare facilities generate considerable amount of solid waste denominated as a whole, Healthcare Waste (HW). Much of this waste (75-90%) is considered similar to those generated in households (recyclable or not)1, while the rest, due to their hazardous characteristics (pathogenicity, toxicity and radioactivity) require different processes for management and treatment before disposal into the environment.

Types of Solid Wastes

- **Infectious Waste -** These wastes may be, among other materials from patient isolation rooms, biological materials, human blood and blood products, anatomical-pathological and surgical waste, sharps waste and animal waste.
- **Special Waste -** They constitute a health danger for their hazardous characteristics such as corrosivity, reactivity, explosiveness, toxicity, flammability or radioactivity. They can be, among others, chemicals and hazardous waste, pharmaceutical waste and radioactive waste.
- **Common Waste -** They do not represent health hazard and its characteristics which are similar to those from normal household wastes. Included in this category are papers, cartons, boxes, plastic, leftover from food preparation and waste from the cleaning of patios and gardens, among many others.

Stages in the Solid Waste Management

Segregation

Each of the waste considered in the classification adopted by the hospital should have a clearly identified suitable container. Color plastic bags and special Sharps containers are both used at this stage. Hospital staff should be trained to associate the colors of the bags with the type of waste disposed within. The bags may be suspended within a structure with cover or placed in a rigid container; the end of the bag should be folded over the edge of the container and must have a lid. The size and number of containers should be appropriate to the expected amount of waste generated in the room. The container should not be too heavy when filled; must be able to be easily handled by one person. In all rooms, except for isolation wards should have a common waste container to prevent the personnel to increase the amount of waste requiring special treatment unnecessarily.

It is important to clearly identify the containers and bags for each type of waste, which also has a preventive effect since all hospital employees will feel responsible for what they place in each bag.

Handling and Storage

The bags and waste containers must be sealed and taken to a special storage place where they will be placed in separate piles according to the color of the bags, twice a day or more in operating rooms and intensive care units. The site should be safe and have facilities to permit cleaning in case of waste spills. the universal biological waste symbol should be at the door of the storage area, in waste containers and in the freezers or refrigerators used for this purpose.

Common waste can be taken directly to an outer container which may be collected by the municipality. The use of pipelines to dispose of bags by gravity must be avoided due to the waste can spread outside the ducts and this will generate bad odors and attract insects. The staff responsible for handling medical waste must wear clothes and personal protection implements for hygienic reasons and to avoid skin lesions.

Vehicles for waste transportation should be stable, quiet, hygienic, proper design and should allow the transport with minimum effort. Hazardous waste must never be transported with municipal waste; and must use special closed vehicles. Also, these wastes should never be transferred, and must remain in the same vehicle from the place in which are generated to the place of treatment and disposal.

In the planning of collection and internal transport of the waste generated in a health care facility should be considered:

- The timing and frequency of collection, which should be known by all staff.
- Avoid high risk routes and choose the shortest route between the place of generation and storage.
- Identify the collection vehicles and internal transport according to the type of waste and disinfect them regularly.
- The collection and external transport should take into account the following points:

Vehicles must be internally lined with stainless steel or aluminum to provide a smooth, impervious surface, in order to avoid spills of any material. Angles and corners must be covered to prevent the accumulation of residual material. Must be provided with a locked door and a ventilation system. The contaminated waste transport vehicle must display on the front and back a painted sign that corresponds to the type of waste transported with letters with at least 80 mm height. The height of the platform or box load should not exceed 1.20 m. When the vehicle capacity exceeds 1 tonne it must have mechanical unloading devices. Once the route is finished, the vehicle must be cleaned and disinfected in an appropriate place. Process residuals must be properly disposed. The vehicle must have the necessary equipment for cleaning and disinfecting occasional spills.

Treatment

Among the technologies available for treating infectious waste may be mentioned the incineration, the autoclave (sterilization by steam) and microwave treatment, among others. The inadequate design or incorrect operation of the treatment systems can generate environmental pollution problems, so it is important to prevent this possibility the proper selection of technology and personnel training in charge of its operation.

- Remove the infectious or hazardous potential prior to waste disposal.
- Reduce its volume.
- Turning surgery waste (body parts) to unrecognizable.
- Prevent improper reuse of recyclable items.

1. Incineration

The wastes are burned under controlled conditions to oxidize the carbon and hydrogen present in the waste. This method is used to treat various types of waste. Non-burnable materials remain as waste. Incinerators must have a dual chamber; a primary with temperatures between the 600 and 850 ° C; and a secondary with 1,200 ° C also must have the filter and a gas scrubber.

The main advantages of this method are the reduction of volume and mass of the material that will be disposed to landfills and the possibility to recover energy to generate steam or electricity.

The disadvantages are that gaseous emissions can contain pollutants and their operation and maintenance, depending on their size can be complex.

2. Autoclave Steam Sterilization

In the autoclave treatment, the waste is exposed to high temperatures by injecting high pressure steam and, thereby destroying pathogens (fig. 5). There are three types of autoclave:

- Gravity displacement autoclave with 121 ° C in temperature and from 1.1 to 1.2 atmospheres of pressure.
- Pre-Vacuum Autoclave with 132 ° C of temperature and between 1.84 and 2.18 atmospheres of pressure.
- Retort autoclave with temperatures higher than 204° C and steam pressure higher than 20.4 atmospheres.

Typically, temperatures of 121° C are accepted with a residence time of half an hour or more depending on the amount of residue. This method is easy to install and operate and exists in the market autoclaves of different capacity. The determining factors are that the residues require a homogeneous distribution in the camera when it has no rotation system; there is little reduction in the volume of waste and needs additional equipment for the steam supply. The indicator of biological control is *Bacillus stereothermophilus*.

Other hazardous wastes can be eliminated as follows:

- Cytotoxic drugs should be burned or chemically degraded by qualified specialists. They should never be diluted or discharged to sewer.
- Radioactive materials can be returned to the nuclear industry that supplied. Most radioactive waste from medical facilities have a low level of radioactivity and a short half-life, so it can be stored under controlled conditions until they can be treated as other waste. Expert advice is required.
- Pressurized containers should be buried or returned to the manufacturer but never burn or mechanically processed.

Final Disposal

1. Security Filling

The risks associated with infectious waste landfill are groundwater pollution, soil contamination and direct staff or casual scavengers' infection. For these reasons, the most suitable alternative for disposal of contaminated waste that has not been treated is security filling.

The advantage of this method is its security if access is restricted and site is appropriately selected. The disadvantages are that restricted access cannot be guaranteed at all times and can be difficult to evaluate the conditions for the security filling.

2. Encapsulation

Encapsulation is the cheapest option for sharps waste disposal; they are placed in a container until fill three quarters and substances such as liquid cement, bituminous sand or plastic foam are poured to fill the container. When the substance is dried, the container may be disposed in a landfill or within the hospital premises. This method is simple, safe, inexpensive and can also be applied to pharmaceuticals. However, it is not recommended for non-sharp infectious waste.

3. Emergency Filling

Emergency filling can also be used as a provisional method or short-term, eg. in field hospitals. A ditch is dug of one meter wide, two meters long and 1.5 meters deep, preferably in a non-waterproof rocky ground. The trench bottom should be 1.5 meters higher than the unconfined water level.

The wastes are placed in the trench up to a meter and then filled with soil. The process is appropriate for sharps, infectious waste and possibly chemical and pharmaceutical waste. Has the disadvantage of having risks of contamination and can be difficult to prevent segregation at all times.

LIQUID WASTE MANAGEMENT

Introduction

Amongst all the category of Biomedical Waste, liquid wastes pose a serious threat to human health and the environment because of their ability to enter watersheds, pollute ground water, and drinking water when improperly handled and disposed.

Types of Liquid Waste

The liquid waste generated from a medical facility is usually of the following types:

a. Infectious waste
b. Blood and body fluids
c. Laboratory wastes (cultures of infectious agents, cultures from laboratories, biological, discarded vaccines, culture dishes and devices)
d. Chemically hazardous
e. Formaldehyde (obtained from pathology labs, autopsy, dialysis, embalming)
f. Mercury (broken thermometers, sphygmomanometer, dental amalgams)
g. Solvents (pathology and embalming)
h. Radioactive isotopes
i. Pharmaceutical liquid waste (discarded/unused/ expiry date medicines)
j. Photographic chemicals (fixer and developer)
k. From cleaning and washing water channeled into the drain.

Table 1: Different types of biomedical waste and their disposal options

Cat	Waste composition	Disposal options
1.	Human anatomical waste-human tissues, organs, body parts	Incineration/Deep burial
2.	Animal waste-animal tissues, fluid, blood, carcass, etc	Incineration/Deep burial
3.	Microbiology and biotechnology waste-from labs	Autoclave/Microwave/Incineration
4.	Sharp waste-needles, syringes, scalpels (used/unused)	Disinfection
5.	Discarded Medicines and Cytotoxic drugs	Incinerate/Land fill
6.	Soiled waste-items contaminated with blood and body fluids	Autoclave/Microwave/Incineration
7.	Solid waste-tubes, catheters, intravenous sets	Disinfection/Autoclave/Microwave
8.	Liquid waste-laboratory, washing, cleaning, housekeeping	Disinfection/Discharge to drains
9.	Incineration ash-ash from incineration of any BMW	Municipal landfill
10.	Chemical waste	Chemicaltreat/Landfill/Todrains

Liquid Waste Management Plan

Segregation and Management of Liquid Waste

According to the Biomedical Waste Management and Handling Rules 1998, liquid pathological and chemical waste should be appropriately treated before being discharged into the public sewer systems. Pathological waste must be treated with chemical disinfectants, neutralized and then can be flushed into the sewage system while the chemical waste needs to be first neutralized with appropriate reagents before being flushed into the sewer. Thus, liquid wastemanagement includesproceduresandpracticesthatpreventdischarge ofuntreatedpollutantstothedrainagesystemortowater bodiesasaresultofthecreation,collection,anddisposal of non-hazardous liquidwastes.

Hence, these wastes should be first segregated and containedinleakproof,rigidcontainersandthenhasto bedisinfectedorneutralized,withanapprovedchemical decontaminationagentatthesiteofgeneration.These containers are labeled with the biohazard symbol and the word "Biohazard" is to be clearly mentioned in the label. If transport is required before decontamination, thenitshouldbecollectedideallyinatwinbincontainer andtransportedthroughpublichallwaysistobekeptto aminimum.Thetwinbincontainerconsistsof,aprimary containercontainingtheliquidwastewhichisplacedwithin anothersecondaryleakproof,rigidcontainer(e.g.,pail, box,orbin),soastoavoidanimpendingspillresponse, duringtransport.Thesecondarycontainermustbelabeled withthebiohazardsymbolandthewords"biohazardous waste"orwithwordsthatclearlydenotethepresenceof infectiousorbiomedicalwaste.Theoutercontainercan either be protected from contamination by adisposable liner,whichisreplacedwhenthebiohazardouswasteis removed,ortheoutercontainercanbedecontaminated following eachuse.

Disposal Procedures forInfectious Liquid Waste

Sanitary Sewer DisposalMethods

The sanitary sewer system is designed for the disposal of certain liquid wastes. Use of the sanitary sewer reduces the chance for leaks or spills during transport and thereby reduces disposal costs.[4] Chemical disinfectionisdonepriortosewerdisposalwiththeaim to eliminate micro-organisms or to reduce themicrobial load.Chemicaltreatmentusuallyinvolvestheuseof1% sodium hypochlorite solution with a minimum contact period of 30 min or other standard disinfectants like, 10-14gmofbleachingpowderin1lwater,70%ethanol, 4%formaldehyde,70%isopropylalcohol,25%povidone iodine, or 6% hydrogenperoxide.

Disinfectionofculturemediadiffersalittlefromtheusual disinfectionprocess,whereduetothehighmicrobialload andtherichproteincontentofthemediaplates,rigorous disinfectionisrequired,whereinactivationshouldbedone by 5.23% sodium hypochlorite, in a 1:10 dilution

and shouldbeleftforaminimumof8hcoveredandthenfinally disposed down the sanitary sewer, followed by flushing withalotofcoldwaterforaminimumperiodof10min.

Sodium hypochlorite solution, also known as bleach, is a broad-spectrum disinfectant that is effective for enveloped viruses (HIV, HBV, HSV), vegetative bacteria (Pseudomonas, Staphylococcus, and Salmonella), fungi (e.g., Candida), mycobacterium(*M. tuberculosis*and *M. bovis*), and non-enveloped viruses (Adenovirus and Parvovirus), should be stored between 50 and 70°F. Undiluted household bleach has a shelf life of 6 months to 1 year from the date of manufacture, after which it undergoes degradation at a rateof20%peryearuntilatotaldegradationtosaltand water. Though a 1:10 concentration of bleach solution hasashelflifeof24honly,somemanufacturerprepared 1:10bleachsolutions,containastabilizerthatincreases the shelf life to approximately 18months.

Recommended Guidelines for Pouring Biomedical Liquid Waste Down the Sanitary Sewer

- Allmicrobiologicalliquidbiohazardouswaste(spent liquid growth culture media containing microbial or human/nonhuman primate or other animal cells, diluted blood and tissue fluids, plasma, etc.) should beautoclavedinacertifiedautoclaveandthenfinally put down the sanitary sewersystem
- The worker should wear personal protectiveequipment which include a lab coat, latex or nitrile glove, safety glasses to protect him from spillage andaerosolsgeneratedduringthedisposalprocess
- Theliquidwasteshouldnotbepouredwherepeople washtheirhandsandshouldbepouredclosetothe surfaceofwatersoastoavoidsplashing.Thewaste basinshouldberinsedandthecontainerdisinfected after pouring of the liquidwaste
- In order to assure adequate inactivation time for exposure of the liquid waste to the bleach, it is the labsupervisor'sresponsibility,tomaintainanofficial logbooklistingeachlotofbiohazardousliquid waste so treated by date and notation of biohazard content (i.e., E. coli culture media, human cell cultures, etc.) and exposure time (e.g., 8:00 AM to 8:00 PM). Hence, bleach treated liquids being held for inactivation in the labs must have a memo note sticker on the covering lid, showing date and time ofbleachexposure(toavoidmistakesregardingthe time of bleach addition). Thus, any biohazardous waste undergoing bleach inactivation and found lacking such a treatment time tag laced on to the tub cover or lacking an up to date official log book is considered to be violation of the approved inactivationprocess.Suchlogbooksmustbekept for a minimum of 3 years and then finally turned over to a Biosafety Office thereafter for long-term retention
- The in charge of the lab or the lab supervisor must usegoodjudgmentinusingchlorineinactivation.For example, inactivation of concentrated microbialcell culture plates by disinfectants might require hours to days of exposure to still higher concentrations of (12-15%)bleachtoachievedisinfection.Considering the high protein levels often present in microbial culturewastestheyshouldbetreatedforatleast8h toallowthebleachtokilltheculturedmicrobesorany othermicrobialcontaminants.Thoughthepresence of a tag noting date and time of exposure will avoid mishapsandtherecordingoftheinactivationperiod willensureadequatekillingtimebuttheseshouldbe ideally autoclaved rather thansanitized

- Microbes like Legionella that can be readily transmitted to humans by aerosols should not be inactivatedbybleachexposureorpoureddownthe drain, for the generation of aerosols during such processes can infect the worker. These also need to be autoclaved; however, during the process of transportationtothesiteforautoclaving,theyshould betightlypackedsoastopreventtheaerosolization of legionella. Hence, spore forming microbes and pathogens that can be readily transmitted by the aerosol route should be autoclaved when present in liquid wastes. These wastes which need to be autoclaved should be directly put into the redbin.

Whilethepracticeofpouringliquidwastedownthedrains, itself in not inherently illegal, because the wastewater treatmentplantscaneffectivelyhandleliquidmedicalwaste as they would residential waste, but the way hospitals actually do it is important, for it can get them into serious trouble if they are not careful or smart. That is because of the healthcare worker's dangerous exposure to splashing andaerosolizedparticulatematterfromtheinfectiousfluid.
Thoughthisoptionisveryeconomicalforthehospitalwith the healthcare worker sporting all the requiredpersonalprotectiveequipment,theOccupationalSafetyandHealth Administration still will issue costly citations becausesuch practiceviolatesOSHA'sbloodbornepathogensstandard.

Solidification of the Liquid Waste

This process involves pouring a powdered solidifying agent into the liquid waste containers, which turns the liquid contentinto a gelatinous solid mass after 5 to 10 min, thus eliminates the need to transport the biohazardousfluidsinaliquidform.Thenthesecontainers can be disposed of as red bag waste. The solidification process is based on a microencapsulation technology that converts liquid waste into solid waste. These are dry granular super absorbent polymers that canabsorb andretainlargevolumesofliquids,whilesomesolidifiers include sanitizing agents in addition, such as chlorine or glutaraldehyde, which may allow the treatedmedical waste to be disinfected prior to solidification.Though theycanrapidlyabsorbfluidsupto300timesitsweight theexpansioninvolumeislessthan1%.Theycanalso be used to solidify and encapsulate water-based spills and the disposal and transport costs are thought to be reduced by as much as50%.

But such novel systems have some weighty problems, for a full three-liter canister may weigh eight pounds aftersolidification.Dependingonthesurgicalprocedure a facility may use between four and eight canisters per procedure.Besidesthisthehospitalsalsoneedtocheck with their landfill operators to make sure that they will accept the solidified fluid medical waste, even if the hospitalsatisfiesallregulatoryrequirements.Andfinally, healthcare facilities have to continually order and store bottles of solidifying powder.

The effectiveness of these powders is questionable because they have not been adequately tested on body fluids. They are considered as pesticides so the health care staff mixing the powder with the suction canister waste is not only exposed to a potential blood borne pathogen splash, but they are also exposed to a pesticide. Disposing of such suction canister waste that has been mixed with the powders also adds more pollutants to the landfills.

Closed Disposal Systems

By and large, the majority of hospitals and other healthcare facilities either pour the treated or untreated liquid waste down the drain, dispose of full or partially filledcontainersofliquidwaste,intactasredbagwaste or solidify it and then dispose of the canisters as either red or yellow bag waste if the respective municipality deems itlegal.

However, the newest choice revolves around closed disposal systems that are designed to collect the fluid waste and dispose it down the sewers with minimal contact of the waste with humans. Most of them are stationary systems mounted to the floor or wall with a vacuumsystemthatusescanistersthatemptiesdirectly to the sanitary sewer, thereby can help a facility cut its infectious waste volume, reduce exposurerisk.

But such closed systems require a large capital expenditure upfront.Apartfromthecostfactorsuchclosedsystems require intense labor activities, for it requires someone to collect, transport and process the waste, maintain a verification log, clean and disinfect the canisters orcollectors and redistribute them. In addition, the equipment has to be maintained by the biomedical engineering department, so they have to be trained on how to use it so that they can repair it. Most of all, clinicianshavealsotobetrainedsoasnottothrowaway the canisters orcollectors.

HCF with No Available Options

Where medical establishments cannot afford the treatment of biomedical liquid waste, the following measures should be undertaken to reduce health hazards:

Patients with enteric diseases should be isolated in wards where their excreta can be collected in buckets for chemical disinfection. This is of utmost importance in cases of cholera outbreaks.

- No chemicals or pharmaceuticals shouldbe discharged into the sewer
- Sludgefromhospitalcesspoolsshouldbedehydrated on natural drying beds and disinfected chemically with sodium hypochlorite, chlorine gas, or chlorine dioxide
- Sewage from these establishments should never be used for agriculture, aquaculture, drinking or recreationalpurposes.

Annex D

SCREENING FORM FOR HEALTHCARE FACILITIES (HCFS) IN CXB

1. Name & Address of the Hospital/Healthcare center :
2. Type of Healthcare Centre :
3. Name & Designation of Responding Person :
4. Population of City/Town :
5. No. of Beds in HCF – what is occupancy rate? How many OPD patients on an average?
6. What kind of care is primarily provided – eg immunization, deliveries, HIV, TB, Minor Surgeries, OPD, GBVetc.
7. Are you aware of the MWM concept and the Policy? Is your facility in compliance? Have you received all the necessary clearances for implementing the policy?
8. What steps have been undertaken to improve the MW Management in your Healthcare facility? How has MW Management progressed over time with the implementation of the various Government's initiative in the health sector?
9. What is the quantity and mode of disposal of different types of wastes generated at your hospital?

Ser	Nature of Waste	Quantity Generated Per Day	Method of Treatment/ Disposal
1	Outdated Drugs, Chemicals and disinfectants used in Labs & for Decontamination of Needles etc.		
2	Syringes, Cannula, Catheters, (Infectious Plastics)		
3	Pathological and anatomical Waste, Infectious Waste, Infected Blood, Cytotoxic waste, etc.		
4	Glass Waste (both broken and non-broken)		
5	Needles, Blades and Scalpels		

10. Do you use reusable syringes? Do you have sterilization equipment in place?
11. What is the mode of collection and transportation of different types of waste generated at the Healthcare Unit?
12. Is there any color-coding used being for collection of different types of wastes? Please elaborate.

Type of Waste	Color of Container and markings	Type of container
Highly Infectious Waste	Red	Strong Leak-proof plastic bag or container capable of being autoclaved
Other infection waste, pathological and anatomical waste	Yellow	Leak-proof plastic bag or container
Sharps	Yellow, marked "SHARPS"	Puncture-proof container
Chemical and Pharmaceutical waste	Brown	Plastic bag or container
Radioactive Waste	-	Lead box, labeled with the radioactive symbol
General Healthcare waste	Black	Plastic bag

13. Is there any wastage (eg small volumes in large bags etc)?
14. What is the durability of the bins provided under the project? Please elaborate.
15. Do you have in-house facilities for treatment of infectious wastes & other wastes? If yes, please give details.

16. Do you have deep burial pits for final disposal?If yes, are the following monitoring activities carried out associated with the burial pits:
    a. Is the groundwater quality around the burial pits monitored?
    b. Are the bottom and sides of the burial pit constructed with impermeable materials?
    c. Are appropriate safety precautionary signage provided with the burial pits?
17. Is there a recycling system in place for the plastics and glass?
18. How durable are the needle cutters/destroyers? Are they being effectively used in all wards?If No, are your using external facilities such as Common Waste Treatment Facilities (CWTFs) for treatment & disposal of waste?
19. How is the MW transported to the Central Waste Treatment Facility (CWTF)? What are charges per tonne of MW paid to CWTF?
20. What is the average quantity of MW sent to CWTF for treatment?
21. What is the level of awareness and training provided to the different levels of staff for better MW management in the hospital? How often has training been provided? Is there ongoing refresher training?

	General Awareness	Refresher Training	About MWM	Frequency
Doctors				
Nurses				
Technician				
Sanitary & Lower Level Staff				

22. Who monitors the effective implementation at each facility?
23. How often does the MWM Team meet? What do they discuss and evaluate? Who is in charge of daily operations?
24. Did you experience any difficulty in obtaining clearances/assistance from the regulatory bodies? Please elaborate.
25. Did you receive adequate assistance from the Ministry of Public Health/Project Management Unit?
26. Have any guidelines/plans been provided to you by the Government?
27. What has been the attitude of the community /NGOs/people at large? Have they contributed towards achieving better MW Management at the HCF?
28. Are you aware of the environmental and health implications of MWM?
29. Which major difficulties/constraints have you faced in implementing better MW Management Systems at the HCF?Which are the critical issues (Both External & Internal)?
30. Which are the 3-4 major actions you have taken to improve the MW management at the Facility?
31. Are any External Agencies such as Independent M&E organizations and/or NGOs who are working with you? Please provide details
32. What kind of support do you get from different agencies such as City Corporations/Pourashava DoE, NGOs, DGHS etc. ? Kindly elaborate

SCREENING FORM FOR HEALTH CAMPS FOR FDMNs

1. Name & Designation of Staff member in charge :
2. What kind of care is primarily provided – e.g. immunization, deliveries, HIV, TB, Minor Surgeries, OPD etc.
3. Are you aware of the MWM concept and the Policy?
4. Are you aware of the environmental and health implications of MWM?
5. What is the quantity and mode of disposal of different types of wastes generated at the camp? (Give approximate estimates if actual information is not available)

Ser	Nature of Waste	Quantity Generated Per Day	Method of Treatment/ Disposal
1	Outdated Drugs, Chemicals and disinfectants used in Labs & for Decontamination of Needles etc.		
2	Syringes, Cannula, Catheters, (Infectious Plastics)		
3	Pathological and anatomical Waste, Infectious Waste, Infected Blood, Cytotoxic waste, etc.		
4	Glass Waste (both broken and non-broken)		
5	Needles, Blades and Scalpels		

6. Do you use reusable syringes? Do you have sterilization equipment in place?
7. What is the mode of collection and transportation of different types of waste generated at the Healthcare Unit?
8. Is there any color-coding used being for collection of different types of wastes? Please elaborate.

Type of Waste	Color of Container and markings	Type of container
Highly Infectious Waste	Red	Strong Leak-proof plastic bag or container capable of being autoclaved
Other infection waste, pathological and anatomical waste	Yellow	Leak-proof plastic bag or container
Sharps	Yellow, marked "SHARPS"	Puncture-proof container
Chemical and Pharmaceutical waste	Brown	Plastic bag or container
Radioactive Waste	-	Lead box, labeled with the radioactive symbol
General Healthcare waste	Black	Plastic bag

9. Is medical waste burnt at the site?
10. Do you have in-house facilities for treatment of infectious wastes & other wastes? If yes, please give details.
11. Is there a third party available in the area for contracting out medical waste management services?
12. Are needle cutters/destroyers available on-site?
13. What is the level of awareness and training provided to the different levels of staff for better MW management?
14. Have any guidelines/plans for MWM been provided to you?

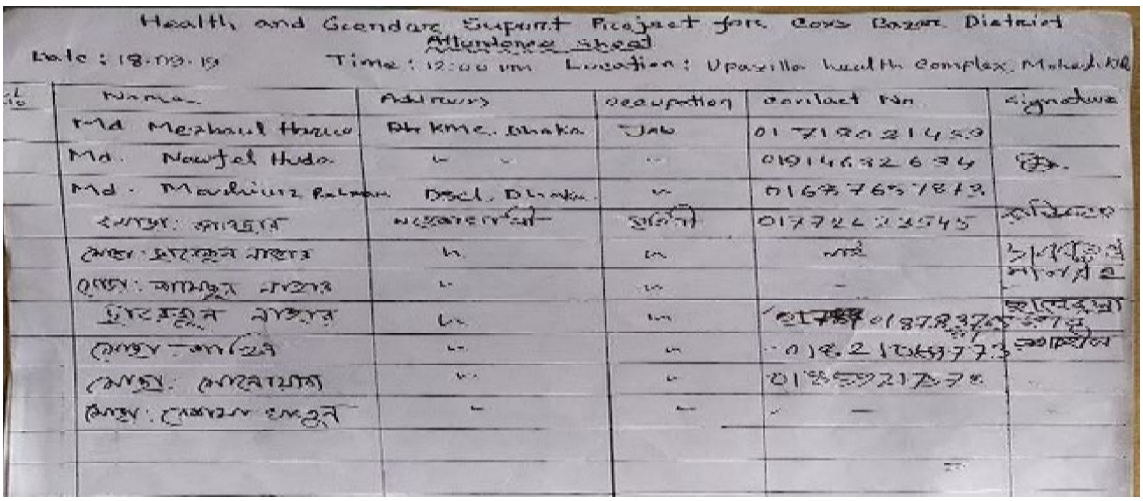
SCREENING FOR TEMPORARY HEALTH CAMP CONSTRUCTION AND RISK OF HEALTH WORKERS

Screening for Construction Sites and health workers' health and safety issues

1. Will the construction work generate significant amounts of dust, odor or noxious gases that are likely to disturb host communities/FDMNs?
2. Will the construction work cause a noise nuisance due to the operation of heavy machinery and other on-site activities?
3. Will the construction work produce significant amounts of runoff, change drainage patterns and/or erosion?
4. Will the construction work disrupt traffic (pedestrian and vehicular) or distributing relief?
5. Will the construction affect access to existing land uses (for example, will the movement and location of heavy equipment, trenching, etc. for rural roads, large drains, interfere with access to private property)?
6. Is the location suitable for treated wastewater or grey water re-use?
7. Is the location easily accessible for differently-able (physically challenged) individuals?
8. Will Health-workers be exposed to a complex variety of health and safety hazards?
9. Will the required measures be provided for the protection of health workers from these workplace hazards (PPE, masks etc.)?
10. Is there an emergency response plan in the event of an accident on site (e.g. fire)?

Annex E

Record and Documentation of Consultation Meeting

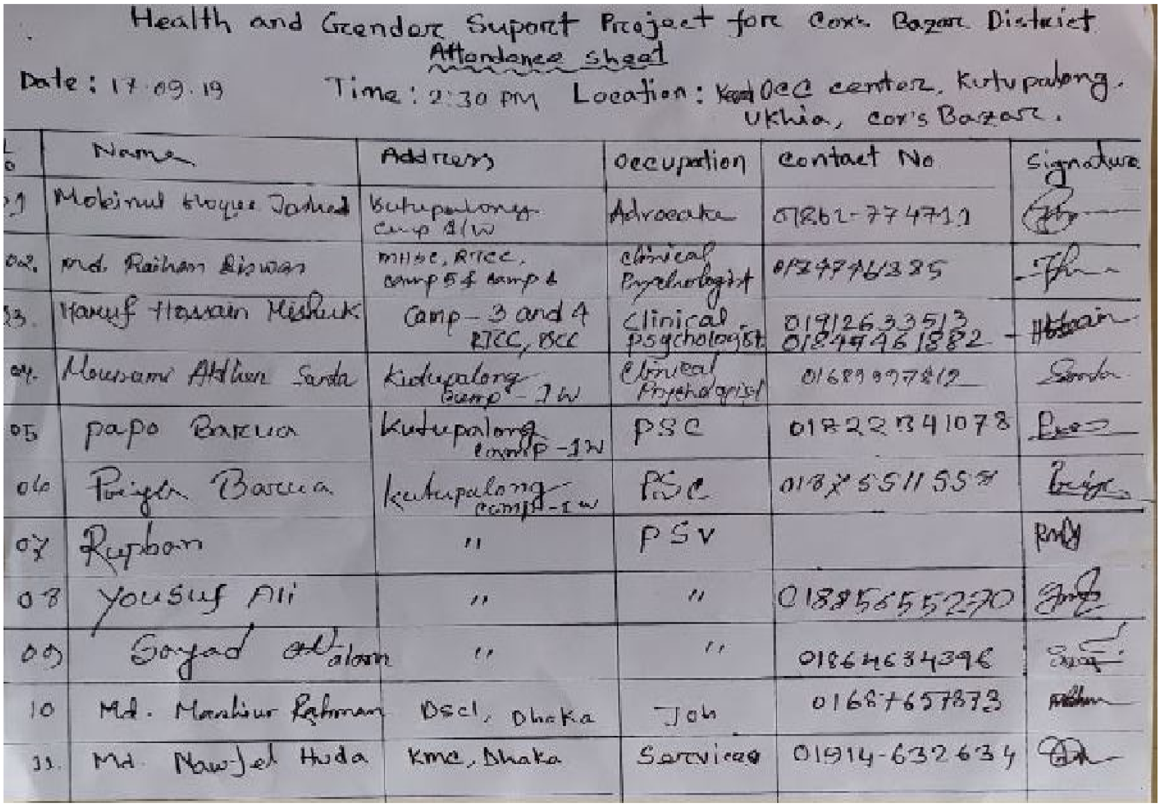


Health and Gendare Support Project for Cox's Bazar District

Attendance Sheet

Date : 18.09.19 Time : 12:00 pm Location : Upazilla health complex, Maheshkhali

Name	Address	occupation	contact No	signature
Md Mezbaul Hasan	Bh KMC. Dhaka	Job	01719021459	
Md. Nawjel Huda	" "	"	01914632634	
Md. Mashiur Rahman	Dscl. Dhaka	"	01687657813	
[illegible]	[illegible]	[illegible]	01772[illegible]2545	[illegible]
[illegible]	"	"	[illegible]	[illegible]
[illegible]	"	"	-	[illegible]
[illegible]	"	"	[illegible]	[illegible]
[illegible]	"	"	018.2[illegible]773	[illegible]
[illegible]	"	"	01[illegible]217[illegible]	
[illegible]	"	"	" —	

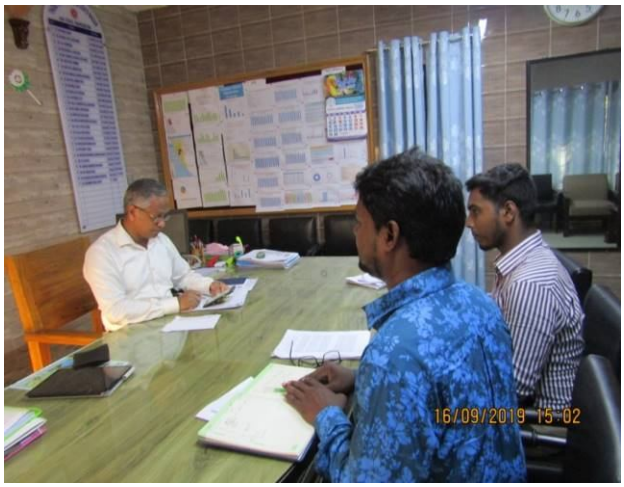


Health and Gendar Suport Project for Cox's Bazar District
Attendance sheet

Date: 17.09.19 Time: 2:30 PM Location: OCC center, Kutupalong, Ukhia, Cox's Bazar.

SL No	Name	Address	Occupation	Contact No	Signature
01	Mokinul Hoque Jahed	Kutupalong camp 1/W	Advocate	01861-774711	[illegible]
02	Md. Raihan Biswas	MHPC, RTCC, camp 5 & camp 6	Clinical Psychologist	01744746385	[illegible]
03	Hanif Hossain Mishuk	Camp-3 and 4 RTCC, BCC	Clinical psychologist	01912633513 01844461882	[illegible]
04	Mousami Akther Sarda	Kutupalong Camp-1W	Clinical Psychologist	01689997812	[illegible]
05	papo Barua	Kutupalong camp-1W	PSC	01822341078	[illegible]
06	Poriyeh Barua	kutupalong camp-1W	PSC	0187551155	[illegible]
07	Rupban	"	PSV		[illegible]
08	Yousuf Ali	"	"	01885655270	[illegible]
09	Soyad alam	"	"	01864634396	[illegible]
10	Md. Mashiur Rahman	DSCL, Dhaka	Job	01687657873	[illegible]
11	Md. Naw-Jel Huda	KMC, Dhaka	Service	01914-632634	[illegible]

Attendance Sheet of Consultation meeting



Meeting with Civil Surgeon, Cox's Bazar

Meeting with Superintendent and Deputy Director, Cox's Bazar Sadar Hospital, Cox's Bazar

Meeting with OCC Coordinator, Cox's Bazar Sadar Hospital, Cox's Bazar

Meeting with Refugee Relief and Repatriation Commissioner (RRRC) Office, Cox's Bazar Sadar Hospital, Cox's Bazar

Consultation Meeting with Service Recipient at Moheskhali Health Complex, Moheskhali.

Consultation Meeting with OCC Center at UkhyiaFDMN Camp, Ukhyia.

Key Informative Interview (KII) with Advocate and In-charge of OCC Center, UkhyiaFDMN Camp, Ukhyia.

Key Informative Interview (KII) with Family Welfare Visitor at Union Health and Family Welfare Center, DakkhinDarong, Kutubdia.

Key Informative Interview (KII) with Family Welfare Visitor at Union Health and Family Welfare Center, BoroMoheskhali, Moheskhali

Key Informative Interview (KII) with Medical Assistant of BoroMoheskhali Community Clinic, Moheskhali.

Key Informative Interview (KII) with Upazila Health & Family Welfare Officer at Ramu Heath Complex, Ramu.

Key Informative Interview (KII) with Upazila Health & Family Welfare Officer at Kutubdia Heath Complex, Kutubdia.

Key Informative Interview (KII) with Social welfare Officer at Moheskhali Heath Complex, Moheskhali.