



Bangladesh Health Sector Support Program (HSSP)

Environmental Management Framework

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MINISTRY OF HEALTH AND FAMILY WELFARE

Government of the People's Republic of Bangladesh

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Abbreviations

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| BDT | Bangladeshi Taka |
| CC | Community Clinic |
| DGHS | Director General Health Services |
| DLI | Disbursement Linked Indicator |
| DP | Development Partner |
| ECA | Environmental Conservation Act |
| ECR | Environment Conservation Rule |
| EMF | Environmental Management Framework |
| GOB | Government of Bangladesh |
| HCF | Health Care Facility |
| HNP | Health, Nutrition and Population |
| HSSP | Health Sector Support Program |
| IEC | Information, Education and Communication |
| MOHFW | Ministry of Health & Family Welfare |
| MWM | Medical Waste Management |
| OP | Operational Policy |
| PDO | Project Development Objective |
| PPE | Personal Protective Equipment |
| UHC | Upazila Health Complex |
| WHO | World Health Organization |

1. Introduction

1.1. Background

1. The Government of Bangladesh (GOB) and partners have pursued a sector-wide approach (SWAp) since 1998, adopting a series of multi-year strategies, programs and budgets for management and development of the health nutrition and population (HNP) sector, with support from both domestic and international financing. The government is in the latter stages of finalizing its Fourth Health, Population and Nutrition Sector Program, covering the 5.5 year period (between January 2017 and June 2022) with an estimated cost of US\$14.8 billion. The Fourth Sector Program’s overall objective is “to ensure that all citizens of Bangladesh enjoy health and well-being by expanding access to quality and equitable healthcare in a healthy and safe living environment.” The World Bank’s project, Health Sector Support Program (HSSP), will support implementation of strategically focused parts GOB’s Fourth Sector Program over the same time period. HSSP is consistent with the GOB’s program and policies and will play an important role in advancing key results areas with the use of disbursement-linked indicators (DLIs).

2. The Ministry of Health Family Welfare (MOHFW) considers the Fourth Sector Program as a first, foundational, program towards the achievement of the Sustainable Development Goals by 2030. The government’s Fourth Sector Program builds on a successful history of the previous sector programs, with well-established planning and consultation processes as well as monitoring and coordination mechanisms. It encompasses three components: (i) Governance and Stewardship, (ii) HNP Systems Strengthening, and (iii) Provision of Quality HNP Services. Like previous sector programs, it is expected that a significant proportion of development partner (DP) support will be channeled through on-budget financing.

3. As Bangladesh builds on significant progress in the HNP sector and pursues progress towards the SDGs, it will face important challenges. These can be characterized in three ways: (i) foundational financing and system development priorities; (ii) the unfinished agenda relating to the Millennium Development Goals; and (iii) emerging challenges. The World Bank’s project, HSSP, will use a set of 21 DLIs in responding to these key challenges. In supporting parts of the GOB’s Fourth Sector Program – including the strengthening of national level systems – HSSP will benefit, directly and indirectly, the entire 160 million population of Bangladesh, including 50 million in Sylhet and Chittagong divisions, who are of particular focus for several indicators. Out of the 21 DLIs included in HSSP, 12 are focused on improving service delivery including maternal and child health and nutrition services in Chittagong and Sylhet (two out of the seven administrative divisions of Bangladesh).

4. Given the parts of the of the GOB’s Fourth Sector Program being supported, the Project Development Objective of HSSP is to strengthen the HNP sector’s core management systems and improve delivery and utilization of essential HNP services, with a focus on selected geographical areas. The DLIs to be supported by HSSP are:

| Component 1. Governance and Stewardship |
|--|
| 1. Citizen feedback system is enhanced |
| 2. Budget execution across programs is increased |
| 3. Spending on repair and maintenance at the service delivery level is increased |

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| Component 2. HNP Systems Strengthening |
| 4. Financial management system is strengthened |
| 5. Asset management system is implemented |
| 6. Procurement process is improved using information technology |
| 7. Institutional capacity is developed for procurement and supply chain management |
| 8. Medicine stock tracking system is developed and implemented |
| 9. Availability of midwives for maternal care is increased |
| 10. Availability of specialist human resources for first-referral care is increased |
| 11. Information systems are strengthened, including gender-disaggregated data |
| Component 3. Provision of Quality HNP Services |
| 12. Utilization of maternal health care services is increased |
| 13. Post-partum family planning services are improved |
| 14. Emergency obstetric care services are improved |
| 15. Immunization coverage and equity are enhanced |
| 16. School-based adolescent health and nutrition services are developed |
| 17. Maternal nutrition services are expanded |
| 18. Infant and child nutrition services are expanded |
| 19. Communicable disease control is improved |
| 20. Non-communicable disease services are developed |
| 21. Coordination on urban health services is improved |

5. MOHFW is responsible for implementation of the GOB’s Fourth Sector Program as a whole, including achievement of the results to be supported by the Project. The ministry encompasses a number of entities: Directorate General of Health Services (DGHS), Directorate General of Family Planning, Directorate General of Health Economics Unit, and Directorate General of Nursing and Midwifery.

6. Government health facilities are situated at different administrative levels: national, division, district, Upazila, union, and ward. HSPP, through the use of its DLIs, will support system development at all levels and service delivery results at the Upazila level and below. Services are delivered by both DGHS and DGFP, operating through parallel systems. The lowest-level facility is the community clinic (CC), serving at the ward level as the first point of contact for primary health care services, including immunization, family planning, and health education. Each CC is intended to serve 6,000 people; currently, 13,094 CCs are functioning. At the union level, three kinds of facilities, each of which include physicians on staff, provide outpatient care: rural health centers, union sub-centers, and union health and family welfare centers. At the Upazila level, services are provided by Upazila Health Complexes, with inpatient capacity of 30–50 beds. Some of these facilities provide first-referral (secondary) care including comprehensive emergency obstetrical care. At the district level, district/general hospitals of different sizes (100–250 beds) provide secondary care, while some districts also have government medical colleges providing tertiary care. In addition, at the district level there are 10-20 bed maternal and child welfare centers providing family-planning as well as maternal care services. The government also runs a number of tertiary and specialized hospitals at the division and national levels.

1.2.Objectives of the Environmental Management Framework(EMF)

7. Environmental issues associated with the health sector creating adverse impact on environment vary widely in nature. Although environmental issues are gaining awareness in health sectors they are not properly addressed in hospitals. Of them medical waste management (MWM) is considered to be the most significant issue. The present effort will be to review the existing situation of MWM and find out gaps and recommendation of mitigation measures accordingly. Under component 3 of the proposed project, a number of healthcare interventions will be carried out in almost 5000 upazila healthcare facilities and community clinics in Sylhet and Chittagong divisions. The detailed baseline scenario and status of medical waste management in these clinics and facilities are unknown at the moment. Therefore, an Environmental Management Framework (EMF) is designed in an effort to control the medical waste to implemented hospital/health facilities premises and improve environmental performance. The EMF provides a template for screening these facilities, designing suitable MWM protocols and a format for monitoring and record-keeping.

8. The MOHFW prepared two Environmental Assessment and Action Plans in 2004 and 2011. This report builds on the findings and implementation progress of the previous plans. The report also includes a gap analysis of the present MWM system and an action plan for the period 2017–2022, including tentative budget.

2. Environmental issues relating to the HNP sector

9. Medical activities safeguard the health of the community but their functioning results in the production of wide varieties of wastes. Medical waste, which is also referred as clinical waste, has to be handled and disposed in a proper manner to eliminate the possibility of injury or infection and safeguarding the environment in general. The impacts associated with improper MWM can damage the environment and adversely affect public health directly and indirectly.

10. Medical wastes contain both general wastes (approximately 75–80%) and infectious wastes (about 20–25%). Medical waste constitutes a public health hazard, if not managed properly. Although majority of the medical waste is no more dangerous than household/municipal waste, the hazardous waste, if exposed to the people or environment in an untreated form, pose various kinds of danger. Thus, the main concern relates to the portion of medical that are defined as hazardous. In particular, medical waste poses particular health risks to the staff of health care facilities (HCFs), to the patients and visitors, to workers collecting, transporting and treating the waste and to the society and environment in general. Thus, there is a need of special effort for proper management of MW by the concerned authorities.

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

- Infectious: Materials containing pathogen in sufficient quantities, that if exposed can cause diseases.
- Sharps: Disposable needles, syringes, saw, blades, broken glasses, nails or any other item that could cause a cut.
- Pharmaceuticals: Drugs and chemicals that return from wards, spilled, outdated, contaminated or are no longer required.
- Radioactive: Solids, liquids and gaseous wastes contaminated with radioactive substances used in diagnosis and treatment of diseases (e.g. toxic goiter).
- Others: Wastes from office, kitchen, room including bed linen, utensils, paper etc.

- 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.
12. 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.
13. The HSSP focuses on improving health service delivery in primary level healthcare facilities in Sylhet and Chittagong. Improving health services would entail generation of medical waste, which will have risks associated with it regarding its handling and treatment. Some general risks associated with medical waste is described below.
14. Medical wastes cause numerous health risks directly or indirectly. There is risk of spread of infection through poorly managed (i) sharp waste (e.g., hypodermic needles, scalpels etc.); (ii) chemical waste (e.g., reagents, solvent etc.); pathological waste (e.g., human tissues, body parts, fetus, etc.); (iii) infectious waste (e.g., blood and body fluids etc.); (iv) pharmaceutical waste (e.g. outdated medications, etc.); and (v) waste with high heavy metal content (e.g., batteries, thermometers etc.). Unhygienic and unsanitary conditions at healthcare facilities can increase the risk and potential for patients to get Hospital Acquired Infections.
15. Poor infection control and occupational health and safety practices due to lack of usage of Personal Protective Equipment (PPE) and lack of training, awareness and understanding of health risks of such poor practices can contribute to increased risk of infection in healthcare facilities. When the workers expose to the hospital environment and do not use appropriate personal protective equipment (PPE) they become vulnerable to different diseases.
16. Additional poor practices with regard to general (non-infectious) waste, such as inadequate storage, poor collection and untimely disposal can attract stray animals and rag pickers and become breeding grounds for vector- borne, water-based and fecal-oral infections. There is also the risk of contamination of water bodies through inadequate disposal of drug waste, expired pharmaceuticals,

heavy metals such as mercury, phenols and disinfectants which can potentially affect a larger community beyond the hospital workers and rag-pickers.

17. The proposed HSSP will finance a slice of the GOB's Fourth Sector Program to support provision of services at the upazila and below levels. Almost 5000 such facilities will be supported by the project. Such activities will generate healthcare waste and the improper management of this may pose significant environmental risk. In Bangladesh, at the upazila level the low amount of waste generated does not encourage outhouse facilities to be developed as it is not financially viable. Moreover, although the policies and regulations related to HCWM are there, the healthcare waste management and monitoring/enforcement institutions are weak at the central level. The institutional limitations are percolated downwards and also likely to be reflected in the primary healthcare facilities. The volume of waste generated in these facilities will be low and therefore the negative impact will be not be as high as in district hospitals.

18. Activities planned under the proposed HSSP will not include any physical interventions such as construction, rehabilitation or renovation works. Hence, negative environmental effects, any loss or conversion of natural habitats, any changes in land or resource use, are not anticipated. The present scenario of MWM in Bangladesh has generally improved, although much more improvements can be done. Section 3 provides an assessment of the current situation of MWM.

3. Review of Present Scenario of MWM in Bangladesh

3.1. Current Status of MWM in Bangladesh

19. According to the Dhaka City Corporation's research report, 3700 metric tons of wastes are generated per day in Dhaka City and about 200 tons are hospital waste of which 40 tons are infectious wastes (Bangladesh Observer, 2000). Estimated amounts of hazardous wastes in Bangladesh, tons/year, 2009-2015 are shown in the following table (which includes all facilities that do not fall under the scope of HSSP):

Table 1: Hazardous waste generated, tons/year

| Area/HCF | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|------------------------------------|------|------|------|------|------|------|------|
| Dhaka | 1275 | 1313 | 1353 | 1392 | 1435 | 1478 | 1522 |
| Chittagong | 663 | 683 | 703 | 724 | 746 | 769 | 792 |
| Rajshahi | 920 | 948 | 976 | 1005 | 1035 | 1066 | 1098 |
| Khulna | 388 | 400 | 412 | 424 | 437 | 450 | 463 |
| Barisal | 270 | 278 | 286 | 295 | 304 | 313 | 322 |
| Sylhet | 292 | 301 | 310 | 319 | 329 | 339 | 349 |
| Maternal and Child Welfare Centers | 161 | 166 | 171 | 176 | 181 | 187 | 192 |
| Total Public HCFs | 3969 | 4088 | 4211 | 4337 | 4467 | 4601 | 4739 |
| Private HCFs | 4239 | 4366 | 4497 | 4632 | 4771 | 4914 | 5062 |
| Total | 8208 | 8454 | 8708 | 8969 | 9238 | 9515 | 9801 |

20. During implementation of EMP 2011, the following challenges were identified:

- The Medical Waste Generators by and large do not maintain any proper record of the different streams of medical waste generated. Inadequate number of color-coded bins, often improperly placed, results in different waste streams getting mixed.
- The segregation of waste is delegated to the ward boys and the sweepers who do not have formal training. The nurses or the ward-in-charge who has received MWM training are not being able to supervise or transfer their knowledge adequately resulting in MWM practices not being implemented.
- There is lack of uniformity in color-coding and segregation procedures among the facilities.
- Needles and syringes were not destroyed before disposal. The needle cutters were not functional (blades becoming blunt after one or two uses) and more often the needle-cutters are usually kept inside the cupboards and are not used. It was also observed that bins used for sharps are not properly designed as per international standards. There is a general reluctance of destroying the sharps and needles.
- Information, education and communication (IEC) materials were not visible at the appropriate places in the facilities.
- The waste trolleys have become defunct and instead the trolleys used for ferrying patients were used for transporting the waste from the wards.
- The temporary storage of the different streams of Medical Waste is not done properly at the HCFs especially in the Public Hospitals.
- The use of personal protective equipment (PPE) such as gloves, masks, boots, etc. is partial. The employees/waste pickers also do not undergo immunization at regular periods, as is required under the Infection Control guidelines.

21. The following table summarizes the key observations related to MWM in Bangladesh:

Table 2: Observations related to key issues in MWM in Bangladesh

| Sl. No. | Issues of MWM | Observation |
|----------------|--|---|
| 1. | Awareness and motivation on MWM | Lack of awareness among the HCF 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 HCFs 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. |

| Sl. No. | Issues of MWM | Observation |
|---------|---------------------------------------|--|
| 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. |

22. Under the previous sector programs, the DGHS has taken initiatives to address some of these issues related to medical waste management in the health sector. In this regard, the DGHS has developed an online record-keeping, reporting and monitoring system for in-house waste management, conducted training on MWM at various levels, explored the feasibility of different out-house waste management options in several hospitals in the country. DGHS has also developed new IEC materials promoting awareness campaign on MWM. However due to weak institutional capacity, inadequate monitoring and lack of awareness and enforcement, the issues associated with Medical waste management are still persisting.

23. HSSP provides an opportunity to enhance systems to ensure provision of safe, clean and hygienic health services while also providing an opportunity to improve measures for waste recycling and minimization. This may reduce the disease burden associated with infection and improve the quality of life. It may also reduce the risk of vector-borne diseases from solid waste dumping sites and pollution of water bodies, which could have a community-wide impact. In-house management should be the only discourse in this case and specific set of activities should follow starting from waste segregation and application of medical waste management guidelines. Since currently the medical waste is inadequately managed in healthcare facilities primarily due to weak institutional monitoring mechanism and inadequate enforcement of existing rules and guidelines, there is scope for improving the scenario and thereby generate a visible positive outcome from this project. Activities associated with the service-delivery related DLIs can increase the use of syringes and sharps, recyclable fluid bags, and consequently increase sharp wastes, recyclable wastes, infectious wastes as well as increase the risk of infection and contamination.

24. MWM at Upazila level HCFs are in progress. Since 2006, the MOHFW has prioritized MWM as an activity under improved hospital service component. The MOHFW also incorporated the waste management initiative for HCFs at the Upazila and below as a component of essential service delivery in line with the national goal to ensure safe, environment-friendly, cost-effective and sustainable management of medical wastes derived from curative, diagnostic, preventive and rehabilitative health care services both in public and private sectors.

25. To implement proper MWM at primary health care level the following strategies are being used:

- a) Development of pits (for infectious, sharps, general and recyclable waste) in UpazilaHealthComplexes.
- b) Regular supply of logistics for collection and transportation of waste and the safety material for the waste handles.
- c) Training/orientation of personal on proper MWM.

- d) Community awareness on waste, its management and individual responsibility.

3.2.Existing Legislative/Regulatory Framework for MWM

26. 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.

National Environmental Policy 1992

27. The concept of environmental protection through national efforts was first recognized and declared in Bangladesh with the adoption of the Environment Policy, 1992 and the Environment Action Plan, 1992. The major objectives of Environmental policy are to i) maintain ecological balance and overall development through protection and improvement of the environment; ii) protect country against natural disaster; iii) identify and regulate activities, which pollute and degrade the environment; iv) ensure environmentally sound development in all sectors; v) ensure sustainable, long term and environmentally sound base of natural resources; and vi) actively remain associate with all international environmental initiatives to the maximum possible extent.

Bangladesh Environmental Conservation Act (ECA), 1995 amended 2002

28. This umbrella Act includes laws for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. It is currently the main legislative framework document relating to environmental protection in Bangladesh, which repealed the earlier Environment Pollution Control ordinance of 1977. The first sets of rules to implement the provisions of the Act were promulgated in 1997 (see below: "Environmental Conservation Rules 1997"). The Department of Environment implements the Act. Under the Act, operators of industries/projects must inform the Director General of the Department of Environment of any pollution incident. In the event of an accidental pollution, the Director General may take control of an operation and the respective operator is bound to help. The operator is responsible for the costs incurred and possible payments for compensation.

Environment Conservation Rules (ECR) 1997 amended 2003

29. These are the first set of rules, promulgated under the Environment Conservation Act 1995. Among other things, these rules set (i) the National Environmental Quality Standards for ambient air, various types of water, industrial effluent, emission, noise, vehicular exhaust etc., (ii) requirement for and procedures to obtain Environmental Clearance, and (iii) requirements for environmental impact assessment according to categories of industrial and other development interventions. Any proponent planning to set up or operate an industrial project is required to obtain an "Environmental Clearance Certificate" from the Department of Environment, under the Environment Conservation Act 1995 amended in 2002. The wastewater generated from healthcare facilities are subjected to the discharge standards set in ECR 1997.

Environment Court Act, 2000

30. The aim and objective of the Act is to materialize the Environmental Conservation Act, 1995 through judicial activities. This Act established Environmental Courts (one or more in every division), set the jurisdiction of the courts, and outlined the procedure of activities and power of the courts, right of entry for judicial inspection and for appeal as well as the constitution of Appeal Court.

Medical Waste (Management and Treatment) Rules 2008

31. The Government of Bangladesh promulgated the Medical waste (management and processing) Rule, 2008 for processing and management of MW in Bangladesh. It was prepared through active participation of MOHFW, MOL and MOEF mainly with the objective of proper management of medical waste and protecting the environment.

32. The Medical Waste (Management and Treatment) Rules 2008 forms the base of management of all medical waste in the country. The rules are applicable only to waste management facility/operators i.e. those involved in transportation, treatment and disposal of medical waste. The law provides for guidance on the collections, storage treatment and disposal of medical waste for management facilities/operators. The institutions or agencies involved in collection, transport, storage, have to obtain authorization from the Department of Environment.

33. The existing Environment conservation Act, 1995 and the Environment Conservation Rules, 1997 had no specific by laws directly related to management of MW management. According to Bangladesh Environment Conservation Act wastes are classified under section 2(1) as “any liquid, solid and radioactive substance that is discharged, disposed or dumped which may cause adverse/negative change to the environment. All these procedures were very general for all kind of establishments and not specific for Management of MW. The shortcoming has been addressed by the new medical waste rules, 2008.

34. Broadly the rule has classified the medical waste (schedule-1) with examples and environment-friendly technologies of management. It also contain suggestion for use of different color bins (schedule-3) for segregation of medical –waste at source and symbol to be used on the packaging of medical-waste (schedule-4) for transporting. In schedule -6 the rule specifies the standard Incineration/ Autoclaving, standard of liquid waste with permissible limits, standard of microwaving, standard for deep burial and standard for radioactive waste treatment and disposal along with other issues related to MWM (The important part of the Medical waste Rule, 2008 has been enclosed in the annexure).The new medical waste rule has urged for ‘formation of authority’ within 3 months of proclamation which will be will be in charge of all activities related to MWM of their area.

35. The regulation specified for different (6 nos.) color bins to be used for segregation of different MW along with specification of container, standard for operation of equipment, effluent and emission standards.

Manual for Hospital Waste Management 2001

36. DGHS has developed a manual for hospital waste management in 2001 which was later updated. The manual is aimed for the hospital managers, health providers, policy makers and all the administrators, with an interest for and with responsibility to ensure hospital wastes are disposed of efficiently and economically as far as possible with a minimal environmental and health impact.

Guidelines on Infection Prevention and Control (IPC) and Biosafety 2016

37. WHO Bangladesh has supported the development of updated guidelines on infection prevention and control (IPC) and biosafety for health care providers. The guidelines focus on measures to ensure patient safety as well as the safety of health care and laboratory personnel.

GOB 7th 5-year Plan (FYP)

38. Under the 7thFYP, the government aims to attain a number of broad goals, including good governance in environmental sustainability, addressing population growth, ensuring the sustainability of cities with improved infrastructure, production and economic activity with minimal degradation, meeting national air and water quality standards, protecting endangered species, sustainable conservation of the Sundarbans Mangrove Forest and reducing potential economic losses from natural disasters. Among the array of activities that will be implemented under 7th FYP, it is mentioned that the GOB will take the following steps to counteract the harmful effects of pollution due to medical wastes:

39. GOB will take measures to improve medical waste management in the country by delivering specific disposal training and with strict enforcement of separate collection & disposal systems.

- a. GOB will establish environmentally acceptable treatment centers for infectious wastes in each divisional city.
- b. Strict compliance of Medical Waste Rules along with in-house and off-the-house management should be established.

Environmental Assessment and Action Plan for HPNSDP, 2011-2016

40. The action plan concentrates on review and mitigation of the potential impacts of MW disposal on environment and focuses on status of MWM in Bangladesh, in which some efforts have been initiated presently. This was a sector-wide assessment and action plan of MWM issues in Bangladesh. It provides recommendations for improvement of medical waste management scenario for Bangladesh. The current Environmental management framework is actually a subset of the previous assessment and action plan of 2011-2016. This EMF has been tailored to suit the specific conditions of the primary level healthcare facilities of Chittagong and Sylhet divisions. Since the scope of the EMF is only primary HCF in selected regions in the country, many of the policy-level and broad-based recommendations as well as specific MWM features of big hospitals are excluded.

3.3. World Bank Policy

41. The WorldBank Safeguard Policy OP/BP 4.01 is triggered because some activities during the operation will produce negative environmental impacts that should be prevented and mitigated. However, the potential negative impact is mainly from generation of medical waste. A Medical Waste Management Plan is therefore prepared as an instrument to safeguard against the effects of medical waste on the environment and human health. In this regards the project is classified as Category B according with the OP/BP 4.01. The EMF will be disclosed according to the Bank's policy of information disclosure

3.4. Compliance Assessment of EMF for ongoing project

42. Under the HPNSDP, DGHS has taken initiatives to address some of these issues related to medical waste management in the health sector. Traditionally, medical waste used to be mixed with municipal wastes from the bins and disposed of, using the conventional disposal methods like burying or incineration. The issue of medical waste management (MWM) is becoming important gradually as the amounts of hazardous/ infected waste is increasing This has necessitated more

attention to blood safety, disposal of needles, syringes and other infectious wastes. To address the issue - the MWM program was introduced during the second Sector Program. It has developed an online record-keeping, reporting and monitoring system for in-house waste management, conducted training on MWM at various levels, explored the feasibility of different out-house waste management options in several hospitals in the country. DGHS has also developed in-house operational guidelines, training modules, pocketbook for service providers and new IEC materials promoting awareness campaign on MWM. However due to insufficient institutional capacity, inadequate monitoring and lack of participation, insufficient inter-ministerial coordination and enforcement, the issues associated with Medical waste management are still persisting. Till June, 2015, 14 MCH, 15 DH and 8 specialist hospitals introduced standard in-house medical waste management. All the public and private HCFs of Dhaka, Comilla and private health care facilities of Chittagong city are now under the MWM scheme of NGOs such as PRISM and INNOVATION. An NGO named SHOPNO have contracted to take care of the MWM of all the HCFs of Bagura, Rangpur and Dinajpur. For the rest of the country, no out-house medical waste management operations exist.

43. Assessments were carried out on the status of medical waste management in Bangladesh in several instances by MOHFW and World Bank¹. The following recommendations were provided:

- proper record of the different streams of MW generated should be kept .
- Formal training on MWM practices to nurses, ward boys and the cleaners needs to be carried out
- the used needles and syringes should be properly destroyed before disposal.
- The IEC materials should be visible at the appropriate places in the HCF during the visit to these facilities.
- Proper transportation of the medical waste from the wards by waste trolleys should be done
- The temporary storage of the different streams of Medical Waste should be done properly.
- The use of PPE such as Gloves, Masks, Boots, etc. should be available as required.
- The regulatory framework for medical waste management does not comprehensively cover the primary producers of medical waste. Also the licenses obtained by the Health Care facilities i.e. Operating License from DGHS and Trade License from the City Corporation do not provide any cross linkages to the medical waste management. Under the existing institutional mechanism, the regulatory authorities do not have any information about the waste generated, treated and disposed. Neither the healthcare facilities nor the CTDE Operators provide any information to the regulators in this regard. In this regard, the loopholes in the regulatory framework should be corrected

¹Environmental Assessment and Action Plan for HPNSDP, 2011-2016 and Environmental Safeguards Assessment Report: Review of EMP Implementation: Health, Population And Nutrition Sector Development Program, 2014

and the institutional mechanism on MWM should be more coordinated. However, this would require policy interventions involving three different ministries.

- Timely collection, transportation and disposal of medical waste should be done by city corporation/ pourashava
- Enhance capacity building for managing of Medical Waste in the organizations i.e. DGHS, Pourashavas/city corporations and MoEF/DoE

3.5. Institutional Framework for MWM

44. In house medical waste management is the responsibility of MOHFW while the out-house medical waste management (collection, transportation and final disposal of medical waste) is the responsibility of MoLGRD (by City Corporation / Pouroshova). City corporation/Pourosova can contract out-house management through NGOs. Government hospital pays service charge to the City Corporation /Pourashova for MWM. At the ministry level, a National Implementation Coordination Committee (NICC) and committee for different administrative level for Out-house management for MWM is formed.

45. In the Upazila level government health care facilities, the current directives state that out-house MWM will be conducted by the hospital authority within the hospital premises by pit method till Pourashovas develop sufficient capacity for MWM or NGOs are available to contract out the MWM.

46. The DGHS has the responsibility to provide technical support to MWM programme at all Government hospital and Private clinics. It provides waste management related logistics to all healthcare facilities, facilitation of training and dissemination of IEC materials.

3.6. Gaps and Challenges in implementation of MWM

47. 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 HCFs
- Inadequate legal provisions
- Lack of sufficient expertise on the issue
- Resource constraints.
- Inter-ministerial coordination and cooperation
- Insufficient supervision and monitoring

48. Lack of manpower (in DoE, various hospitals etc.), lack of coordination (among the implementers of MWM), lack of required fund are the main reasons for delay in the implementation of proper MWM in the country.

49. 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. The increased budget required for improved MWM is not normally included

in the regular health budget, which is considered as a significant barrier to improve the MWM. Appropriate allocation by introducing a budget line in the HCF operation budget can solve the problem.

4. Improving MWM in under the HSSP

4.1.Measures to Improve MWM

50. Basic best 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.

51. The measures to improve MWM under HSSP(2017–2022) are as follows:

Table 3: Measures to improve MWM under HSSP

| 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 wastes. |
| Strengthen institutional capacity and compliance | <p>Improve health care waste management, particularly focused on the Upazila Health Complex and below, by ensuring:</p> <ul style="list-style-type: none"> ● 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; and ● availability and visibility of information, education and communication materials on health care waste management in health facilities. |
| Strengthening implementation | <ul style="list-style-type: none"> ● Monitoring and reporting on the implementation of MWM, particularly focused on the Upazila Health Complex and below. ● Capacity building for health workers on MWM, particularly focused on the Upazila Health Complex and below. Appropriate capacity enhancement training on infection control as well as management of sharps will be conducted for the relevant staff of HCFs. ● Standard Operating Procedures (SOPs) to be finalized and promoted extensively among all HCFs. ● 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 |

| Issues | Measures to improve MWM |
|--------|-------------------------|
| | monitoring mechanism. |

4.2. Funding for implementation of MWM Action Plan

52. The MOHFW has estimated cost of implementing MWM for the period 2017-2022. The following table provides the tentative budget:

Table 4.2: Estimated budget for MWM, 2017-2022

| Item | BDT lakh | US\$ | The mitigation measure issues addressed |
|---|----------|-----------|--|
| Supplies and logistics | 1176 | 1,507,692 | Strengthen institutional capacity and compliance |
| Disposal of general waste by Municipality from Upazila Health Complex | 64.5 | 82,692 | Strengthen institutional capacity and compliance |
| Activation of different committee for facilitating MWM | 16 | 20,513 | Strengthen policy and legal framework |
| Capacity development/Training on MWM (Foreign) | 750 | 961,538 | Strengthening implementation |
| Capacity development/Training on MWM | 175 | 224,359 | Strengthening implementation |
| TV show, audio visual materials, radio program etc. | 50 | 64,103 | Strengthen institutional capacity and compliance |
| Development of IEC & BCC materials | 50 | 64,103 | Strengthen institutional capacity and compliance |
| Printing & distribution of Manuals | 50 | 64,103 | Strengthening implementation |
| Technical assistance requirement | 20 | 25,641 | Strengthening implementation |
| Total | 2356.5 | 3,021,154 | |

4.3. Monitoring of implementation of the MWM action plan

53. Monitoring of the implementation of MWM is essential to ensure the reduction of infection from wastes generated from HCFs and ensuring restoration of environmental qualities in general to ensure the quality of human life and sustainable environment for future perspective. Monitoring of the status of present practices of the HCFs is also important. The MWM situations of various HCFs are quite different in different areas. Some HCFs, where training has been imparted and logistics are available have got different scenario than those HCFs, where no training has been arranged, no and no logistics available.

54. There is a need of preparation of a uniform format for reporting of MWM activities at all the HCFs of the country, which will furnish information/data regarding the present status of MWM in the particular HCF, to be submitted to DGHS/DGFP annually. Moreover, monitoring of the MWM activities of HCFs who have already practicing MWM as per guidelines is also crucial, as there might exist many gaps in some HCFs which might require further improvement. Information related to the following would be monitored on a yearly basis:

- Training of total hospital staff
- Segregation efficiency and disinfection and storing quality;
- Transporting efficiency and safety;
- Occupational health and safety aspects of related health workers;
- Environmental impacts around disposal sites Emission and effluents characteristics from facilities;
- Monitoring the total MWM in the light of Environmental Regulation of MWM 2008.

55. At the upazila and below level facilities, the relevant guidelines of MWM 2008 will be adopted. Different colour bins will be supplied to the UHCs for collection of waste at their generation points. Mainly nurses and cleaners will segregate and collect the waste while the doctors will be responsible for their monitoring. The UHCs will also be provided with trolley for transporting the segregated waste to storage.

56. The DGHS currently has a MWM monitoring arrangement. A Deputy Director of DGHS is responsible for MWM activities and he is supported by technical consultants. The HCFs under the proposed program will report to this section of DGHS. This includes carrying out screening and assessment with recommended actions (see Annex C for template). The MWM team of DGHS will collect, analyze and summarize the information from HCFs and share their findings to the World Bank team in a quarterly basis.

4.4. Institutional Framework for Implementation of EMF

57. In order to increase accountability for implementation of EMF- the NICC and defined committees at different administrative level will be made functional. MOHFW/ DGHS will appoint national consultant for technical assistance, development of different documents, guidelines and action plan. Consultant also helps in rebuilding inter-ministerial coordination and cooperation, supervision and monitoring action.

58. The head of hospital should appoint the members of the waste-management team in writing informing each of their duties and responsibilities. The head should appoint a waste management officer who will have overall responsibility for monitoring the day-to-day operation and monitoring of healthcare waste disposal system.

5. General recommendations

59. The proposed program provides an opportunity to improve the medical waste management scenario in Sylhet and Chittagong in Bangladesh. This may reduce the disease burden associated with

infection and improve the quality of life. It may also reduce the risk of vector-borne diseases from solid waste dumping sites and pollution of water bodies, which could have a community-wide impact. In-house management is proposed for primary HCFs and specific set of activities should follow starting from waste segregation and application of medical waste management guidelines. Since currently the medical waste is inadequately managed in healthcare facilities primarily due to weak institutional monitoring mechanism and inadequate enforcement of existing rules and guidelines, there is scope for improving the scenario and thereby generating a visible positive outcome from this project. Activities associated with the service-delivery related DLIs can increase the use of syringes and sharps, recyclable fluid bags, and consequently increase sharp wastes, recyclable wastes, infectious wastes as well as increase the risk of infection and contamination. Through effective implementation of HCWM activities in line with the GOB's MWM 2008, the risks can be adequately mitigated. Specific activities will include capacity building of relevant personnel, proper segregation of waste, disposal of sharps and introducing deep burial pits for sharps and infectious wastes/body parts.

60. Monitoring of the implementation of this EMF will be detailed out in the relevant operational manual. Some general recommendations for dealing with MWM in the HSSP are given below:

- An MWM monitoring cell with representation of DGHS, DGFP, and other relevant GOB departments and ministries should be set up to oversee the implementation of EMF related to MWM;
- Training and awareness building needs to be imparted for carrying out proper MWM;
- Surveys need to be conducted on the status of MWM carried out by the HCFs;
- The MWM monitoring cell should closely supervise MWM of HCFs.

Annex A: Public Consultation

A stakeholder discussion was organized by the Ministry of Health and Family Welfare (MOHFW) on 14 March, 2017 in the Conference Room of MOHFW, Bangladesh Secretariat on the Environment Management Plan. A wide range of stakeholders (participant list attached in Annex B) including Health Ministry officials (MOHFW, DGHS), Local Government officials (City Corporations), Public works department, health care facilities from Sylhet and Chittagong division attended the meeting (Figure A1). The meeting was chaired by Joint Chief, MOHFW.



Figure A1: Consultation workshop organized by MOHFW on 14 March, 2017

A general introduction and salient features of the Environmental Management Plan was presented through PowerPoint slides. Various limitations of the MWM system in Bangladesh, with particular emphasis in the Sylhet and Chittagong Divisions were discussed. The participants in general agreed that healthcare waste management should be given more priority by the concerned authorities involved. A summary of their feedback and response from the PMU team is given below:

| Comments | Response |
|--|--|
| It was brought to notice that the monitoring of MWM activities generally received very small budget allocation. The allocation for monitoring should be increased to have a positive outcome in this regard. | The PMU agreed with the feedback. PMU informed that a separate budget has been allocated in 2017-2022 for medical waste management. The PMU will look into issues of monitoring. |

| Comments | Response |
|---|--|
| <p>In most of the upazila health complexes (UHCs, 20-bed/10-bed health clinics), there is no system for segregating solid and liquid medical waste. Even all UHCs have not been provided color-coded bins as specified in the medical waste management guidelines. Open dumping is practiced in these cases.</p> | <p>The MOHFW officials assured that they will take measures to provide color-coded bins to all UHCs under the current program.</p> |
| <p>The health official from Sylhet informed that although the waste is segregated in some of his facilities, when the city corporation collects the waste they take away the whole thing together which undermines the effort of segregation. This is because the city corporation does not have a separate facility to manage the medical waste and treats medical waste and municipal solid waste in the same manner.</p> | <p>PMU informed that segregation has to be done in the HCF. And disposal of sharps and hazardous waste need to be done at the facility and should not be handed over to city corporations.</p> |
| <p>In many clinics in Sylhet, there are no separate bins for different kind of medical wastes. This indicated that the MWM efforts by MOHFW have not reached some of the locations in this region and there is need to ramp up efforts in the region.</p> | <p>The MOHFW officials assured that they will take measures to provide color-coded bins to all UHCs under the current program.</p> |
| <p>Some participants stated that all primary HCFs should have burial pits for treating a part of the medical wastes since out-house medical waste management facilities are not available in these regions. Some other participants mentioned that not all primary HCFs may have enough space to construct a burial pit.</p> | <p>The MOHFW officials assured that they will take measures to construct burial pits under the current program as per current directives of MWM.</p> |
| <p>Some participant opined that some sort of indicator for the performance of medical waste management may be incorporated in the DLIs so that its progress can be tracked over time.</p> | <p>The PMU will look into it in future.</p> |
| <p>Some participants stated that the Chittagong hill tracts and Bandarban have different geographic features (i.e. hilly regions) compared to other flat regions in Bangladesh and hence the traditional medical waste collection and management system may face challenges (geographically remote areas, inaccessible areas etc.). These should be addressed in the medical waste management plan.</p> | <p>The feedback was acknowledged by the PMU. The PMU will look into devising appropriate MWM options on a case by case basis.</p> |

| Comments | Response |
|--|--|
| <p>One of the participants mentioned that the Expanded Programme on Immunization (EPI) is facing challenges in managing its sharp wastes. Often the sharps are not collected for a very long time, remain stacked up in storage places for extended periods of time before they are transported from primary health complex to secondary and tertiary facilities. This is because the primary level UHCs do not have the facility to dispose EPI sharps and these had to be transported to higher facilities. Since the collection of wastes from primary HCFs occur very infrequently, the waste is stacked there for extended period which is not safe. In such situations, in-house sharps management facility needs to be developed.</p> | <p>Feedback acknowledged by the PMU. Onsite sharps burial pits can relieve the pressure of storage of EPI sharps under the proposed program.</p> |
| <p>Some participant mentioned that there is both coordination and information gap between the health ministry and the LGRD ministry regarding MWM. The efforts from both ministries need to be well-coordinated to improve the MWM scenario of Bangladesh in general.</p> | <p>The PMU will bring these issues forward in inter-ministerial meetings.</p> |

AnnexB: Participant List for Stakeholder Discussion

Participant list of Stakeholder Consultation on EMF, FPPP & SMF for the 4th Health Population & Nutrition Sector Program (HPNSP) of Ministry of Health and Family Welfare (MOHFW)

| SL No. | Name | Designation | Phone |
|--------|--------------------------|---|----------------------------|
| 1. | Dr. Nilo Kumar Tandangya | Councilor, CHTRC | 01819675793 |
| 2. | M.M. Reza | CTA, PMMU | 01819555525 |
| 3. | Dr. Mir MustafizurRahman | Health Officer Dhaka South City Corporation | 01711547578 |
| 4. | Dr. UdaySarkarChakma | Civil Surgeon, Bandarban | 01746215350 |
| 5. | Begum ShahaNaz | Deputy Director of Family Planning | 01711146922 |
| 6. | M. A. Jabbar | Councilor, KHDC | 01553559274 |
| 7. | BiplobBarun | Deputy Director Family Planning, Khagrachari | 01815592827 |
| 8. | Dr. ShahidTaluqder | Civil Surgeon, Rangamaty | 01554303477 |
| 9. | SabirkumarChakm | Councilor, R. H. D. C | 01720693062 01818930037 |
| 10. | ThowaiHlamongmarma | Councilor, B. H. D. C | 01553645252 |
| 11. | Dr. Md. MazedChyOvi | Representative, CS. Civil Surgeon office, Chittagong | 01819173997 |
| 12. | Dr. AbulKalamAzad | Civil Surgeon office Sylhet | 01711111429 |
| 13. | K M Hasanuzzaman | Executive Engineer, HED | 01718780526 |
| 14. | Dr. U Khey Win | DDFP Chittagong | 01817734833 |
| 15. | Dr. Md. Abdus Salam | Civil Surgeon Khagrachari | 01819361412 |
| 16. | Dr. Aung THA Loo | DDFP Bandarban | 01715546605 |
| 17. | Dr. LuthfunnaherJasmin | DDFP Sylhet | 01711174222 |
| 18. | Dr. Md. LutforRahman | VO, DNCC Dhaka | 01711341086 |
| 19. | Rabindranath Sarkar | | 01712278211 |
| 20. | Dr. Abdus Salam Howlader | PM (Research) PMR, DGHS, Mohakhali | 01712219534 |
| 21. | Md. AbdurRakib | Deputy Chief Ministry of cultural Affairs | 01552474175 |
| 22. | Md. HumayunKabir | Assistant Chief PM, DGFP | 01911361300 |
| 23. | Md. Faruk Ahmed Bhuiya | Line Director DGHS | 01715165914 |

| SL No. | Name | Designation | Phone |
|---------------|-----------------------|--|--------------|
| 24. | Dr. T.M. MoziburHoque | Director, ESD DGHS | 01922455723 |
| 25. | SubinayBhattacharge | Deputy Secretary MOCHTA | 01711156702 |
| 26. | HossainShohid | UNDP | 01819241272 |
| 27. | S.Y. Khan Mojlish | CHTDF-UNDP | 01610012347 |
| 28. | Most. Salma Khatun | Deputy Director, Admin Directorate General of Nursing and Midwifery | 01716357755 |
| 29. | Most. Shahinoor Begum | Assistant Director, COD, Directorate General of Nursing and Midwifery (DGNM), Dhaka | 01731-926976 |
| 30. | Dr. Saiful Islam | DPM CBHC, DGHS | 01818031386 |
| 31. | S.M. Sadekul Islam | Executive Engineer PWD | 9552912 |
| 32. | KamrunNaharSumi | Assistant Chief, MOHFW | 01716597221 |
| 33. | Dr. Md. Abdul Wadud | DPM (HSM), DGHS | 01711300721 |
| 34. | NurunNahar | SAC, MOHFW | 01550153612 |
| 35. | MahfuzaAkhter | Deputy Secretary ERD | 01711003657 |
| 36. | Md. Huzur Ali | SAC, MOHFW | 01814-126168 |
| 37. | RejwanulHoque | SAC, MOHFW | 01715238975 |
| 38. | Mohammad Abdul Azim | Assistant Director, DOF | 01552361091 |
| 39. | Md. Rafiqul Islam | SAC, MOHFW | 01712659160 |
| 40. | ShereenAkhter | SAC, MOHFW | 01716323838 |
| 41. | Dr. Md. JaynalHoque | PM (ARRH) MCH-S unit, DGFP | 01534304749 |
| 42. | Dr. NurunNahar Begum | DD & PM (OA) CCSDP, DGFP | 01911344276 |
| 43. | Prof. FerdousJahan | WB | 01714133008 |
| 44. | Sylvia Islam | Senior Development Advisor Global Affairs Canada | 01713013204 |
| 45. | Dr. IqbalKabir | Coordinator CCHPU, MOHFW | 01714165204 |
| 46. | A.Waheed Khan | Planning & Coordinator PMMU, MOHFW | 01713017615 |
| 47. | Dr. Tanvir Ahmed | Assoc. Prof. BUET | |
| 48. | ZaminaIsrat | Technical Support Nutrition to Add. Sec. PH&WH, MOHFW | 01711243411 |

| SL No. | Name | Designation | Phone |
|---------------|--------------------|--|--------------|
| 49. | Md. Abdul Mannan | P&C Specialist, PMMU, Ministry of Health and Family Welfare, Azimpur, Dhaka | 01552443625 |
| 50. | ShailaSharminZaman | M&E Specialist, PMMU, Ministry of Health and Family Welfare, Azimpur, Dhaka. | 01733505577 |
| 51. | Md. Zahidul Islam | PMO (FP), PMMU, Ministry of Health and Family Welfare, Azimpur, Dhaka. | 01552344528 |
| 52. | Md. Ibrahim Khalil | SAC, MOHFW | 01709600472 |
| 53. | Md. Akteruzzaman | PMMU | |

Annex C: Screening Form for Healthcare Facilities (HCFs)

1. Name & Address of the Hospital/Healthcare centre :
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 etc.
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?

| S No. | 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, Conules, 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?
17. Is there a recycling system in place for the plastics and glass?
18. How durable are the needle cutters/destroyers?
19. Are they being effectively used in all wards?
20. If No, are your using external facilities such as Common Waste Treatment Facilities (CWTFs) for treatment & disposal of waste?
21. How is the MW transported to the CWTF?
22. What are charges per tonne of MW paid to CWTF?
23. What is the average quantity of MW sent to CWTF for treatment? Please Elucidate.

24. What is the level of awareness and training provided to the different levels of staff for better MW management in the hospital?
25. How often has training been provided? Is there ongoing refresher training?

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

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

Annex D: Design Aspects and Specifications of a 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. 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.

- 1 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.
- 2 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.
- 3 On each occasion, when wastes are added to the pit, a layer of 10 cm of soil shall be added to cover the wastes.
- 4 Waste disposal into the pits should be performed under close and dedicated supervision.
- 5 The deep burial site should be relatively impermeable and no shallow well should be close to the site.
- 6 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.
- 7 The location of the deep burial site should be authorized by the prescribed authority
- 8 The institution should maintain a record of the kind of waste sent for deep burial.
- 9 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

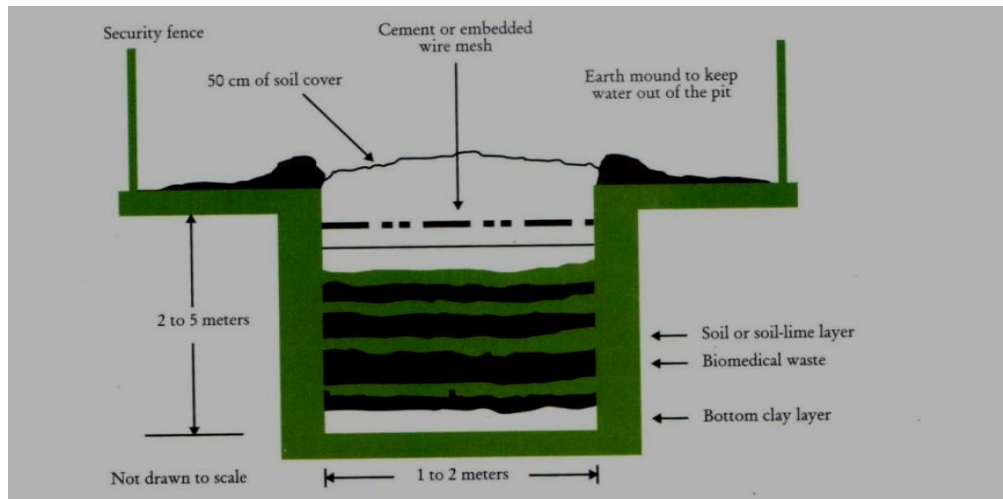


Figure: Layout Specifications for Burial Pit
 (Source "Implementation Experience in India & Tool-Kit for Managers, The World Bank)