

Government of West Bengal
Department of Health and Family Welfare
Bio-Medical Waste Management for Basic Health Care System
In Rural West Bengal



Report of the Working Group on Health Care Waste Management
With Technical Support from GTZ and DISHA

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List of Abbreviations

BMW	Bio-Medical Waste	HCWM	Health Care Waste Management
BMWM	Bio-Medical Waste Management	H & FW	Health and Family Welfare
BMOH	Block Medical Officer, Health & Family Welfare	MOIC	Medical Officer in Charge
BPHN	Block Primary Health Nurse	MoEF	Ministry of Environment and Forest
BPHC	Block Primary Health Centre	ORS	Out Reach Session
CMOH	Chief Medical Officer, Health & Family Welfare	PCB	Pollution Control Board
CPCB	Central Pollution Control Board	PHC	Primary Health Centres
CTF	Central Treatment Facility	PPE	Personal Protective Equipment
CD	Chemical Disinfection	RH	Rural Hospital
GP	Gram Panchayet	SIHFW	State Institute of Health & Family Welfare
HCU	Health Care Unit	SC	Sub Centres
HA	Health Assistant	UIP	Universal Immunization Programme
HA (F)	Health Assistant (Female)	VDC	Vaccine Distribution Centre
HCW	Health Care Waste	WMI	Waste Management In-charge

GOVERNMENT OF WEST BENGAL
DEPARTMENT OF HEALTH AND FAMILY WELFARE
STATE FAMILY WELFARE BUREAU
SWASTHYA BHAWAN, GN 29, SECTOR-V
SALT LAKE, KOLKATA-700 091

Acknowledgement

Government of West Bengal, Department of Health and Family Welfare has introduced Health Care Waste Management under the State Health System Development Project II in the tertiary and secondary level hospitals. German Technical Cooperation was requested to facilitate the development of a strategy for the basic health care level institutions.

The Department identified Society for Direct Initiative for Social & Health Action (DISHA) as consultant. DISHA had long experience of working in the field with the state government in the secondary level hospitals. For the present assignment they carried out Waste Audit, Facility Assessment and Literature Review and presented the study in a workshop attended by the national and state experts, representatives of the West Bengal Pollution Control Board, state and district level officers and staff. Presentation and discussion in the workshop paved the way for development of a strategy.

Followed by this the Department constituted a Working Group on Health Care Waste Management at the state level. Extensive district level consultations followed. As a result the Working Group has been able to develop a draft strategy on HCWM to be used at the Basic Health Care Level with the help particularly of DISHA and technical support from the German Technical Cooperation to whom we are thankful.

We also thank all those who directly or indirectly contributed to the development of the draft strategy.



Dr. A. C. Debnath,
Jt. Director (F.W.) and Convenor
Working Group on Health Care Waste Management

THE TEAM

A. Working Group on Health Care Waste Management:

Dr. S. N. Dutta,
Jt. DHS (PH & CD) & Nodal
Officer, HCWM, DoHFW,
GoWB.

Dr. A. C. Debnath,
Jt. Director & Chief
Technical Offer, BHP,
DoHFW, GoWB.

Dr. Tapas Sen,
Technical Officer, SPSRC,
DoHFW, GoWB.

Dr. Aniruddha Mukherjee,
Technical Officer, SPSRC,
DoHFW, GoWB.

Dr. K. K. Bose,
Dy.CMOH-I, Bankura,
DoHFW, GoWB.

Dr. Ashish Mallik,
Dy.CMOH-I. Purba
Medinipur, DoHFW, GoWB.

B. Technical Support Team of GTZ:

Ms Bulbul Baksi,
Programme Manager

Dr. J. N. Pandit,
Senior Technical Expert

Dr. T. K. Gope,
Technical Expert

Ms Sonali Guha,
Technical Support Officer

Ms Sabari Kar Gupta,
Technical Support Officer

C. The Team from DISHA comprising of:

Pradip Chatterjee,
Project Director

Sasanka Dev,
Project Coordinator

Advisors –

Ravi Agarwal

Prof. Arunava Majumdar

Diptarup Kahali

Introduction

The Basic Health Care System provided by the Government in rural areas of West Bengal comprises of 251 Block Primary Health Centres, 922 Primary Health Centres and 10356 Sub-Centres and more than 20000 Out Reach Immunisation Session sites.

Developing a Strategy for Bio-Medical Waste Management for this huge system called for a host of activities.

The specific jobs for the purpose have been:

- I. Waste Audit in specified HCUs. Review of Literature on Bio-Medical Waste Management (with special focus on primary health care).*
- II. Facility Assessment at specified HCUs (with special focus on primary health care).*
- III. Sharing experience and views in Stakeholders' Workshop.*
- IV. Development of Strategy Action Plan.*
- V. Preparation of Training Manual.*

*The tasks of **Waste Audit, Literature Review and Facility Survey** have already been completed and final reports have been submitted.*

*A **Stakeholders' Workshop** with wide ranging participation has been conducted and the report thereon has also been circulated.*

***Waste Audit** conducted in chains of basic health care units in three different areas (one each in hilly, plain and riverine region) of West Bengal helped in estimating the quantities of waste generated by different categories of HCUs in the primary health care system in West Bengal.*

***Review of Literature** offered a number of options for management of basic health care waste from strategy planning to choice of treatment devices and procedures including training and IEC materials.*

***Facility Assessment** helped in developing an understanding of present situation (waste management status, available personnel and infrastructure etc.)*

***Stakeholders' Workshop** dealt with the problems associated with strategy development and subjected available options to critical assessment by participants.*

*The **Strategy Action Plan** has been developed basing on the above exercise.*

The present document is aimed at presenting a comprehensive strategy for BMWM including all its nodal areas i.e. collection, storage, transportation, treatment and disposal along with administration and training at every level of primary health care system and the necessary steps for their integrated utilization.

The BMWM strategy presented in this document has been developed with the objective to help establish a system that –

- A. Complies to existing rules and guidelines*
- B. Is economic to run*
- C. Is simple to adopt*
- D. Utilises existing waste management facilities*
- E. Utilises existing vaccine delivery route*
- F. Maximise resource recovery*
- G. Minimise use of plastic bags i.e., minimise waste generated in the process of waste management*

*This document has three main parts: **General Considerations, Steps for Planning** and **Annexure**.*

***General Considerations** contain the Principles, Waste Minimisation Policies, Quantities and Categories of waste to be managed at each level, Statutory Guidelines (Rules, Notifications, Orders etc.) and some*

relevant notes on bio-medical waste management. Together these points constitute the basic norms and directions and thus to be reckoned with throughout the strategy planning process.

***Steps for Planning** gives out a step-by-step procedural instruction to develop **District Level** strategy action plan for Basic Health Care Waste Management. It starts from options for immediate management and goes on to lay down the procedure for planning and installation of Common Treatment Facilities including calculation of costs and monitoring.*

***Annexure** comprises of the specifications and costs of the facilities and equipments to be used, specimen consolidated cost, format for record keeping, specimen checklist for monitoring, statutory formats for legal compliance and directions for mercury waste management. Managerial aspects have been arranged into an at a glance compilation. A note on private initiative in bio-medical waste management has also been given.*

This document is a tool for development of implementation action plan for Bio-Medical waste management for Basic Health Care System in rural areas of West Bengal and as every tool for action is subject to be honed through practice and interactions.

General Considerations

A. Guiding Principles for Bio-Medical Waste Management

Principles –	Purport –
Polluter Pays Principle	Onus of management rests with the producer of waste
Duty of Care Principle	Persons attending Health Care Waste Management to be ethically responsible to take utmost care
Precautionary Principle	Areas of unknown risk to be treated as those of significant risk
Occupational safety Principle	Workers who collect, transport or dispose of hazardous wastes must be trained on proper work procedures, emergency procedures and on the use of personal protective equipment.
Segregation at Source	Bio-Medical waste to be segregated from General Waste at the point of generation
First manage the most hazardous	The priority for managing different categories of bio-medical waste should be according to the hazards associated with them.
Proximity Principle	Treatment and disposal of health care waste to be done closest possible to its source
Avoid Toxics	Reduction in use of toxics reduces health and environmental risks. Avoid using equipments and utilities with mercury and PVC and toxic decontaminants.
Avoid Multiple Handling	Choose segregated collection and handling methods according to disposal options to avoid multiple handling
Zero Waste Principle	Follow 3Rs – waste minimization, composting the bio-degradables, recycling the recyclables
Low Cost, Effective & Incremental Approach	Try to avoid unsustainable capital intensive, highly sophisticated procedures, prefer simple but effective measures with gradual upgradation and monitoring

B. Towards Zero Waste Management

Follow 3Rs – Reduce, Reuse, Recycle

Minimising the waste in general and bio-medical waste in particular reduces the cost and troubles of waste management on the one hand and saves environmental cost on the other.

At the heart of waste minimisation are activities that: -

- **Reduce waste generation,**
- **Reuse non-contaminated and decontaminated waste, and**
- **Recycle waste.**

Proper Purchase Policy – can reduce waste by opting for bulk purchase to minimise the packaging waste and negotiating with vendors to provide materials that can be reused and/or recycled.

Doing away with disposable items and opting for reusable items as far as possible reduces waste generation.

Proper Segregation – separate collection of general and infectious waste reduces the quantity of infectious waste that has to be treated before disposal.

Proper Treatment of infectious waste can reduce waste by destroying the pathogens but protecting the materials that can be composted or recycled.

Composting the Bio-Degradable waste from both the general and the infectious waste streams further reduces the quantity of waste to be finally disposed.

Recycling the Recyclable waste from both the general and the infectious waste streams also reduces the quantity of waste to be finally disposed.

Avoiding Hazardous Materials like mercury and PVC in hospital equipments and utilities helps prevent toxic risks of their recycling and disposal.

These principles and policies call for a whole course of action comprising of adopting policies, developing strategies, assessing possibilities, fixing targets, making action plans and getting started together with support from top management level to staff process ownership at the ground level.

C. Categories & Quantities of Bio-Medical Waste Generated Per Day in the HCUs

(for the sake of planning the quantities are approximated by rounding off to next higher amount)

HCU	Bio-Medical				General	
	Anatomical	Sharps	Soiled (Compostable)	Solid (Recyclable)	Compostable	Recyclable
ORS/SC (for around 50 beneficiaries)	x	30 gms.	10 gms.	300 gms.	x	70 gms.
PHC (Non-bedded)	x*	150 gms.	200 gms.	200 gms.	300 gms.	200 gms.
PHC (10 Bedded)	400 gms.	250 gms.	1200 gms.	700 gms.	2000 gms.	1200 gms.
BPHC (20 Bedded)	1100 gms.	500 gms.	2000 gms.	1000 gms.	4200 gms.	2800 gms.

For bedded institutions at the basic health care facilities about 750 grams of waste is generated per bed per day of which about 60% are General Waste and about 40 % are Bio-Medical Waste.

In sub-centers and outreach sessions about 10grams of waste is generated per beneficiary and about 80% of these are infectious bio-medical waste.

* Non-bedded PHCs also provide for emergency delivery of pregnant mothers. As such, there may be occasional generation of anatomical waste (placenta).

B. Important Directions of the Bio-Medical Waste (Management & Handling) Rules 1998

- **Treatment & Disposal Options for Relevant Categories of Bio-Medical Waste generated in Basic Health Care System in Rural Areas**

Cat. No.	Waste	Treatment & Disposal Options
1	Human Anatomical Waste (human tissues, organs, body parts)	incineration/deep burial
4	Waste sharps (needles, syringes, scalpels, blades, glass, etc. that may cause puncture and cuts. This includes both used and unused sharps)	disinfection (chemical treatment)/autoclaving / microwaving and mutilation/ shredding
5	Discarded Medicines (wastes comprising of outdated, contaminated and discarded medicines)	incineration/destruction and disposal in secured landfills
6	Soiled Waste (Items contaminated with blood, and body fluids including cotton, dressings, soiled plaster casts, lines, beddings, other material contaminated with blood)	incineration/autoclaving/microwaving
7	Solid Waste (wastes generated from disposable items other than the waste sharps such as tubings, catheters, intravenous sets etc).	disinfection by chemical treatment / autoclaving/ microwaving and mutilation/ shredding

- **No untreated bio-medical waste shall be kept stored beyond a period of 48 hours.**
- **CPCB Guidelines for Disposal of BMW generated during UIP suggests boiling as a treatment option where autoclave is not available.**
- **CPCB Guidelines on Common Treatment Facilities and Incineration suggests that no categories of bio-medical waste other than Cat.1 & Cat.2 are to be incinerated.**

- **Colour Coding and Type of Container for Disposal of Bio-Medical Wastes**

Colour Coding	Type of Container for respective Waste Category	Treatment options as per the Rules
Yellow	Plastic bag Cat. 1, Cat. 2, and Cat. 3, Cat. 6.	Incineration/deep burial
Red	Disinfected container/plastic bag Cat. 3, Cat. 6, Cat.7.	Autoclaving/Microwaving/ Chemical Treatment
Blue/White translucent	Plastic bag/puncture proof Cat. 4, Cat. 7. container	Autoclaving/Microwaving/ Chemical Treatment and destruction/shredding
Black	Plastic bag Cat. 5 and Cat. 9 and Cat. 10. (solid)	Disposal in secured landfill

- **Colour coding of containers for waste categories with multiple treatment options as defined in the Rules, are to be selected depending on treatment option chosen.**
- **Standards for gravity flow autoclaving (suggested to be convenient for the present job) requires,**
 - a temperature of not less than 121°C and pressure of 15 pounds per square inch (psi) for an autoclave residence time of not less than 60 minutes; or**
 - a temperature of not less than 135°C and a pressure of 31 psi for an autoclave residence time of not less than 45 minutes; or**
 - a temperature of not less than 149°C and a pressure of 52 psi for an autoclave residence time of not less than 30 minutes.**

The steam sterilizer (autoclave) should have auto-recording system of operational parameters.
A chemical indicator strip/tape that changes colour when a certain temperature is reached can be used for verification of temperature.
- **Transportation directions:**
 - Untreated biomedical waste shall be transported only in such vehicle as may be authorised for the purpose by the competent authority as specified by the government.**
 - The container shall, apart from the label [Bio-Hazard Symbol] prescribed in Schedule III, , also carry information [Contents, Location and Date of Generation and Destination] prescribed in Schedule IV. [see Annexure-XVII]**

- **Standard for Chemical Disinfection:** Chemicals treatment using at least 1% hypochlorite solution or any other equivalent chemical reagent.

- **Standards for Deep Burial**
 - i. A pit or trench should be dug about 2 meters deep. It should be half filled with waste, then covered with lime within 50 cm of the surface, before filling the rest of the pit with soil.
 - ii. It must be ensured that animals do not have any access to burial sites. Covers of galvanised iron/wire meshes may be used.
 - iii. On each occasion, when wastes are added to the pit, a layer of 10 cm. of soil shall be added to cover the wastes.
 - iv. Burial must be performed under close and dedicated supervision.
 - v. The deep burial site should be relatively impermeable and no shallow well should be close to the site.
 - vi. 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.
 - vii. The location of the deep burial site will be authorised by the prescribed authority.
 - viii. The institution shall maintain a record of all pits for deep burial.

- **Maintenance of Records:**
 - (1) Every authorised person shall maintain records related to the generation, collection, reception, storage, transportation, treatment, disposal and/or any form of handling of bio-medical waste in accordance with these rules and any guidelines issued.
 - (2) All records shall be subject to inspection and verification by the prescribed authority at any time.

(See ANNEXURE – XIV: SPECIMEN FORMAT FOR RECORD KEEPING)

E. Important Notes

- **Defanging Injection Syringes:**

Needles are to be removed from syringes immediately after administering injection using a suitable syringe / needle cutter that cuts plastic hub of syringe and not the metal part of needle.

- **Immediate Decontamination of Cut Needles:**

Cut needles are to be chemically disinfected in Safety Box immediately to preclude infection from needle-stick injury.

- **Preference for CTFs:**

Common Treatment Facilities (CTFs) are to be opted for wherever possible.

- **Use of Steam Sterilisers:** Where Autoclave with recording facility is not available, common Steam Sterilisers may be used for treatment of infectious waste as a transitional measure. CPCB “Guidelines for Disposal of Bio-medical Waste Generated during Universal Immunisation Programme (2004)” suggests boiling in water where autoclaving is not available.

- **Cleaning of Bins:**

The proposed system suggests not using plastic bags for soiled, solid and sharp waste. The bins for respective categories of waste have to be thoroughly cleaned by washing with disinfectants each time after emptying.

- **Bins in 2 Sets:**

Used Bins should be replaced by clean Bins when taking the former for release of collected waste and cleaning.

- **Placement of Bins:**

Safety Box for sharp waste and bins for collection of other bio-medical waste should be strictly under the charge of concerned medical workers (nurses, pathologists, lab technicians etc.) and are to be placed specifically at the places of generation of such waste (nursing station, labour room, laboratory etc.) Patients and visitors should not have access to these containers.

Step 1: Reviewing Options

Reviewing the options that may be available is primarily necessary to draw a strategy for BMWM. For convenience the options are subdivided into the following six sections:

- I. Options for collection, treatment and disposal of BMW immediately after generation**
- II. Options for transportation of BMW as and when necessary**
- III. Options for method of final disposal of BMW**
- IV. Options for the location of final disposal of BMW**
- V. Options for adopting a system of procurement**
- VI. Options for Authorisation for Generation & Management of BMW**
- VII. Options for monitoring safe disposal of BMW**

These options are to be considered at every level of the existing primary health care system in West Bengal (ORS, SC, PHC & BPHC).

Incineration (of human anatomical waste) as per the prescribed standard in BMW Rules will be very expensive considering the small amount of waste to be incinerated and as such has been opted out as an option for treatment.

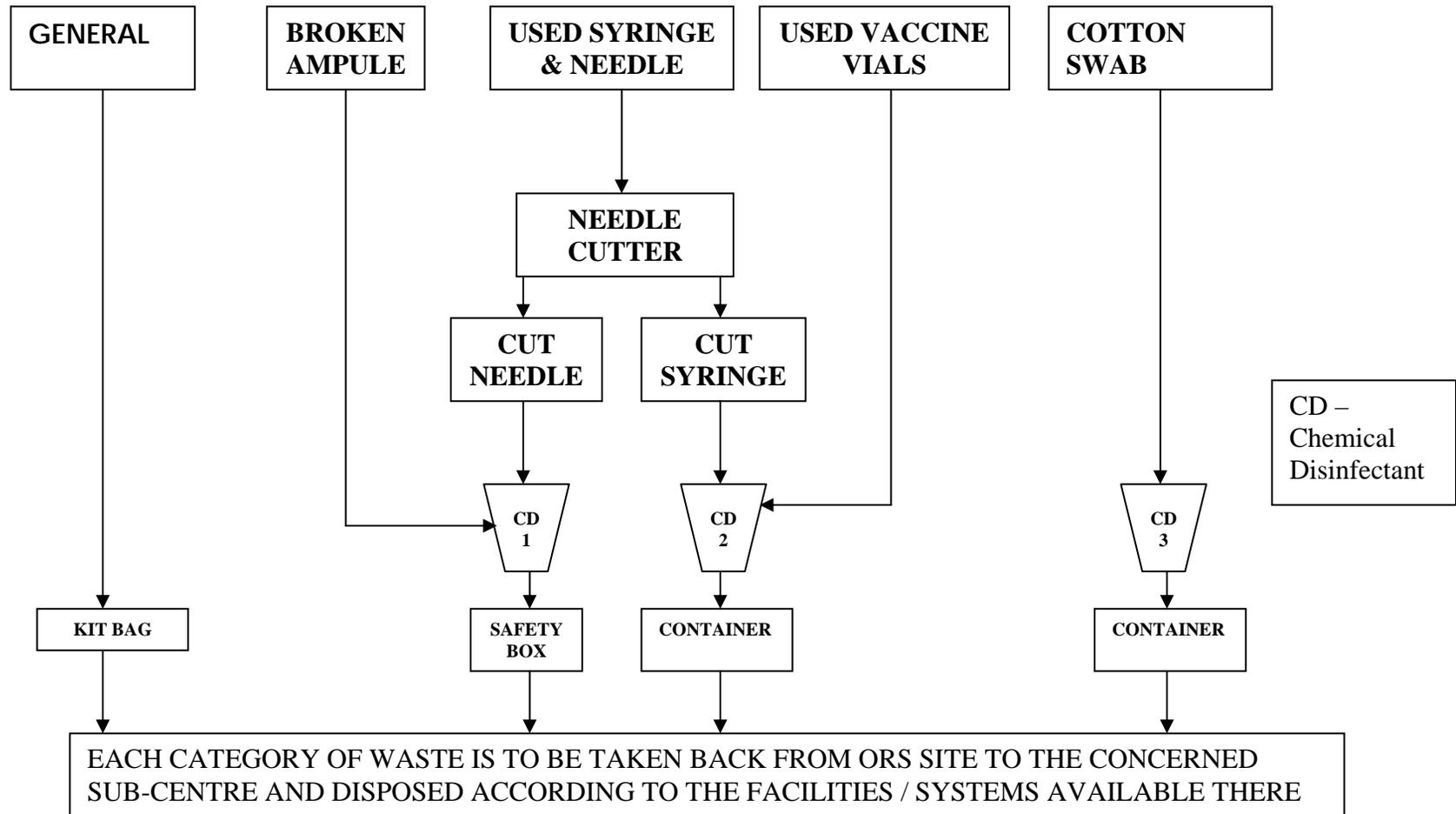
I. Options for collection, treatment and disposal of BMW immediately after generation

a) Outreach Session Level >>

WASTE CATEGORY	OPTIONS			
	I	II	III	IV
Bio-Medical				
Syringe & Needle	Defang >> Put Needles & Syringes in chemical disinfectant separately	Put chemically treated – 1. Needles & Ampules in safety box 2. Cut Syringes & used Vials in container	Bring back to Sub-Centre/VDC* – 1. Safety Box with Needles & Ampules 2. Containers with Syringes & Vials	1. Dispose Needles & Ampules from safety box in sharp pit at Sub-Centre / GP Hqr. Sub-Centre / Vaccine Distribution Centre OR In case of remote Sub-Centres put Needles & Ampules from safety box into Campus Pit 2. Send Syringes, Vials & Bottles to nearest disposal site (RH/BPHC/PHC) OR In case of remote Sub-Centres put Syringes & Vials into Campus Pit
Broken Ampule	Put Broken Ampules in chemical disinfectant with Needles			
Used Vaccine Vial	Put used Vaccine Vials in chemical disinfectant with Syringes			
Cotton Swabs	Put Cotton Swabs separately in chemical disinfectant	Put chemically treated Cotton Swabs separately in container	Bring back to Sub-Centre/VDC container with cotton swabs	
General				
Packs & Papers	Take back to concerned Sub-Centre to put in General Waste Stream			

*VDC – Vaccine Distribution Centre

FLOW CHART FOR WASTE MANAGEMENT AT OUT-REACH SESSION LEVEL



NOTES FOR ORS:

Out-Reach Sessions generally do not have any fixed area or site. These are held in remote areas and are conducted by concerned Sub-Centres once or twice a month (may be once in a week in future) with a view to reach out immunization services to the remote areas. The seat of the immunization session is fixed by temporary arrangements. As such installation of sharp pits may not always be possible for Out-Reach sessions.

There will be a maximum of 30gms. sharp waste, 10 gms. cotton swabs and 300 gms. used syringe and vaccine vials per 50 immunisations.

To prepare chemical disinfectant (1% solution) 10 gms. of sodium hypochlorite/bleaching powder is to be mixed with 1 liter of water. Items to be decontaminated should be placed in the solution for at least one hour.

Each category of waste is to be taken back from ORS site to the concerned Sub-Centre and disposed according to the facilities/systems available with the Sub-Centre.

Materials required:

1. Needle Cutter.
2. Safety Box to decontaminate and carry cut needles.
3. Container to decontaminate and carry cut syringes and vaccine vials.
4. Chemical Disinfectant.
5. PPE for handler.
6. Kit Bag to carry waste management tools.

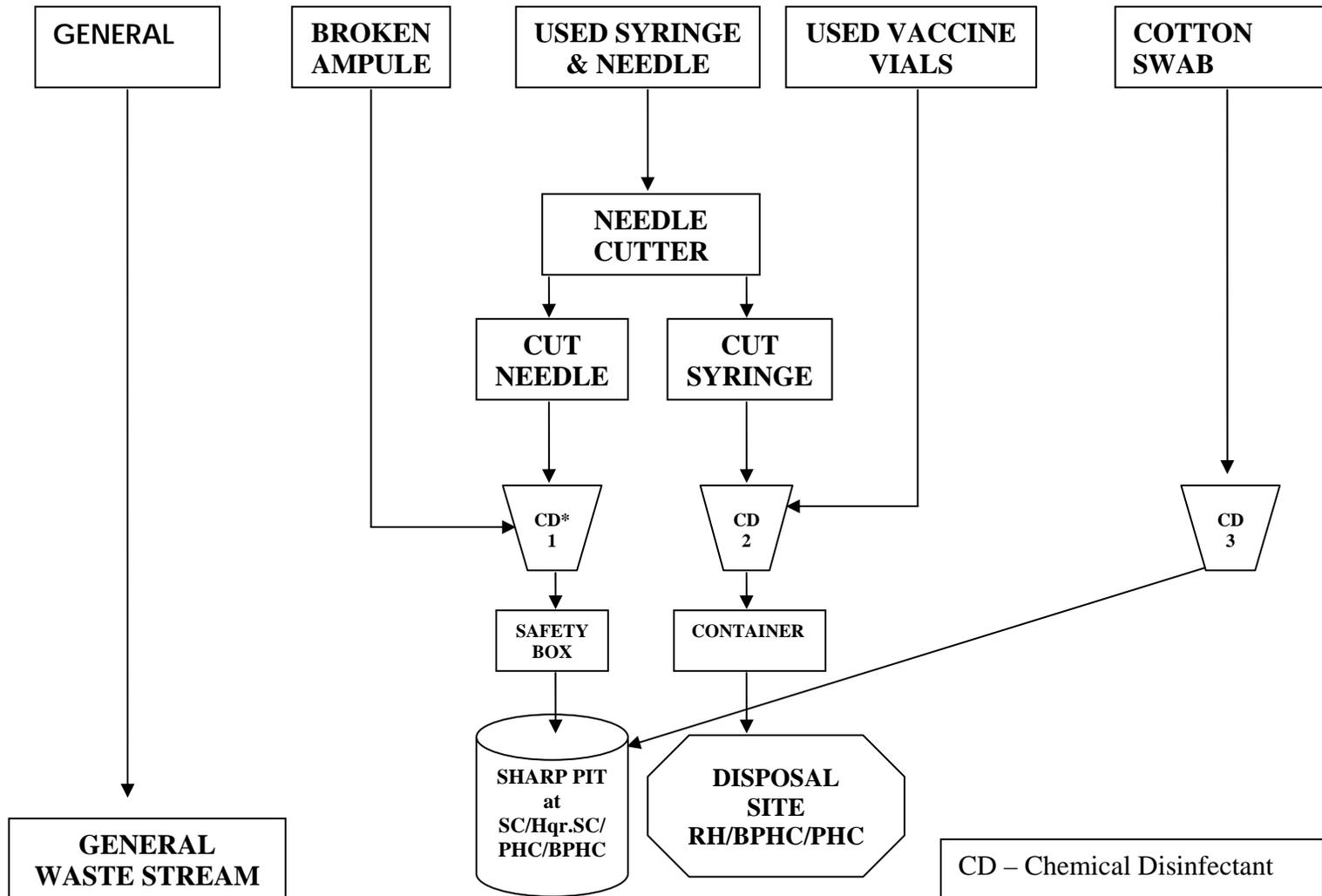
Personnel Available:

HA (F) – 1
HA (M) – 1, or
Health Volunteer - 1

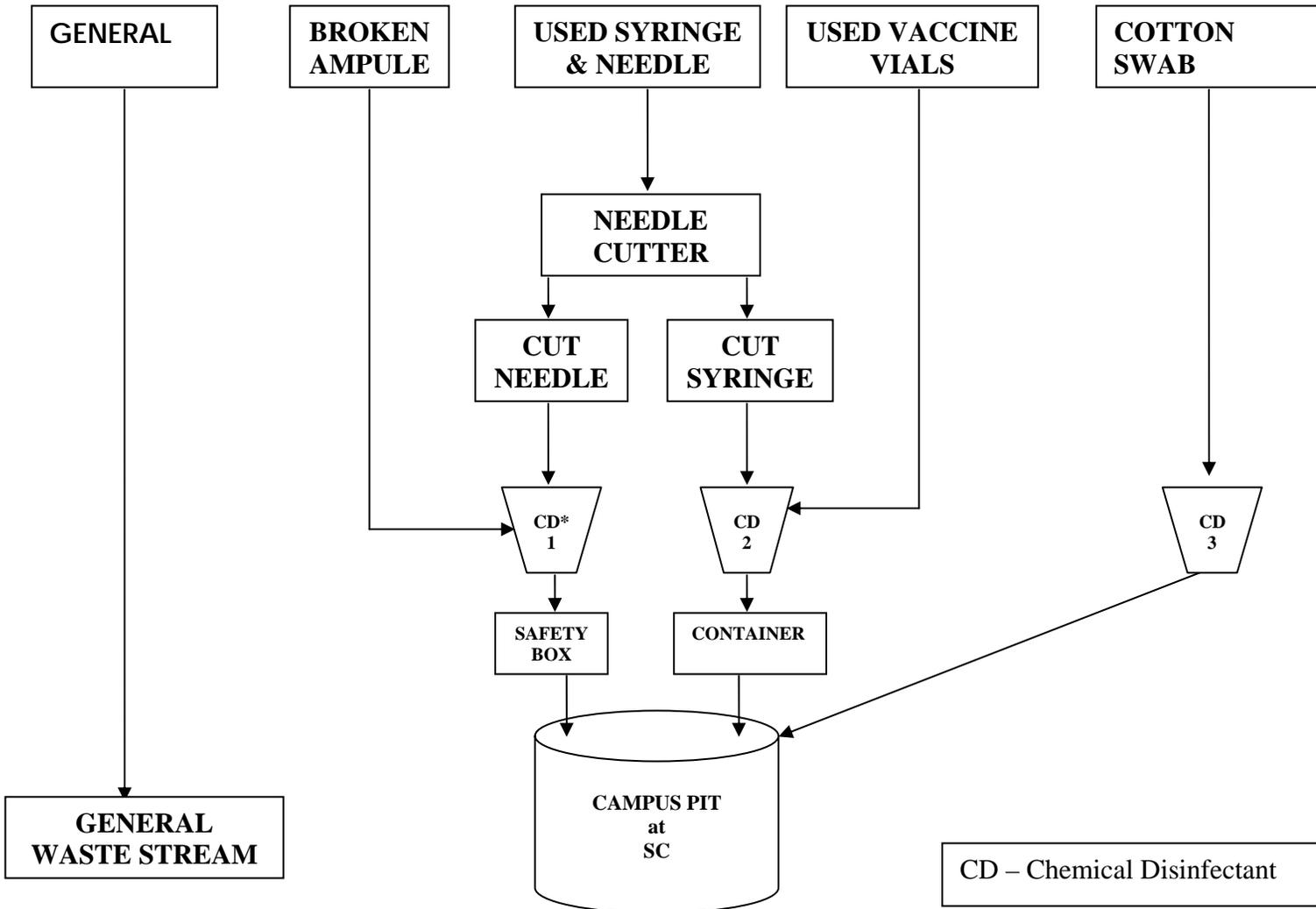
b) Sub-Centre Level >>

WASTE CATEGORY	OPTIONS		
	I	II	III
Syringe & Needle	Defang >> Put Needles & Syringes in chemical disinfectant separately	Put chemically treated – 1. Needles & Ampules in safety box 2. Syringes, Vials & Bottles in container	1. Dispose Needles & Ampules from safety box in sharp pit at Sub-Centre / GP Hqr. Sub-Centre / Vaccine Distribution Centre OR At remote Sub-Centres put Needles & Ampules from safety box into Campus Pit 2. Send Syringes, Vials & Bottles to nearest disposal site (RH/BPHC/PHC) for sterilization and recycling OR At remote Sub-Centres put Syringes, Vials & Bottles into Campus Pit
Broken Ampule	Put Broken Ampules in chemical disinfectant with Needles		
Used Vaccine Vial	Put Vaccine Vials in chemical disinfectant with Syringes		
Cotton Swabs	Put Cotton Swabs separately in chemical disinfectant	Put chemically treated Cotton Swabs in a small pit /sharp pit OR At remote Sub-Centres put chemically treated Cotton Swabs in Campus Pit	
General			
Packs & Papers	General Waste Stream		

FLOW CHART FOR WASTE MANAGEMENT AT SUB-CENTRE LEVEL



FLOW CHART FOR WASTE MANAGEMENT AT REMOTE SUB-CENTRES



NOTES FOR SUB-CENTRE:

Sub-Centres are health care units below PHC level that attend to the public health and family welfare services. There may be three types of Sub-Centres: (a) GP (Gram Panchayat) Head Quarters Sub-Centre and some other Sub-Centres which are in govt. buildings, where construction of pits are possible. (b) Sub-Centres which are in private premises, where construction of pits may not be possible. And, (c) very remote Sub-Centres wherefrom no waste may be taken for recycling. For the first type sharp pits are recommended. For the second type all waste is to be taken to nearest disposal facility (GP Headquarter SC or PHC/BPHC). For the third type the system has to be self contained and confined – all waste has to be put into a campus pit.

There will be a maximum of 30gms. sharp waste, 10 gms. cotton swabs and 300 gms. used syringe and vaccine vials per 50 immunisations.

By another estimate the quantity of waste generated is: sharp 70gms, soiled 50gms and solid 100gms per 50 attendances.

Materials Required:

1. Needle Cutter.
2. Safety Box to decontaminate and carry cut needles.
3. Container to decontaminate and carry cut syringes and vaccine vials.
4. Chemical Disinfectant.
5. PPE for handler.
6. Kit Bag to carry waste management tools.

Personnel Available for BMWM:

HS - 1
HA (F) – 1
HA (M) – 1
Health Volunteer – 1

Constructions Required: (If construction allowed)

Sharp Pit

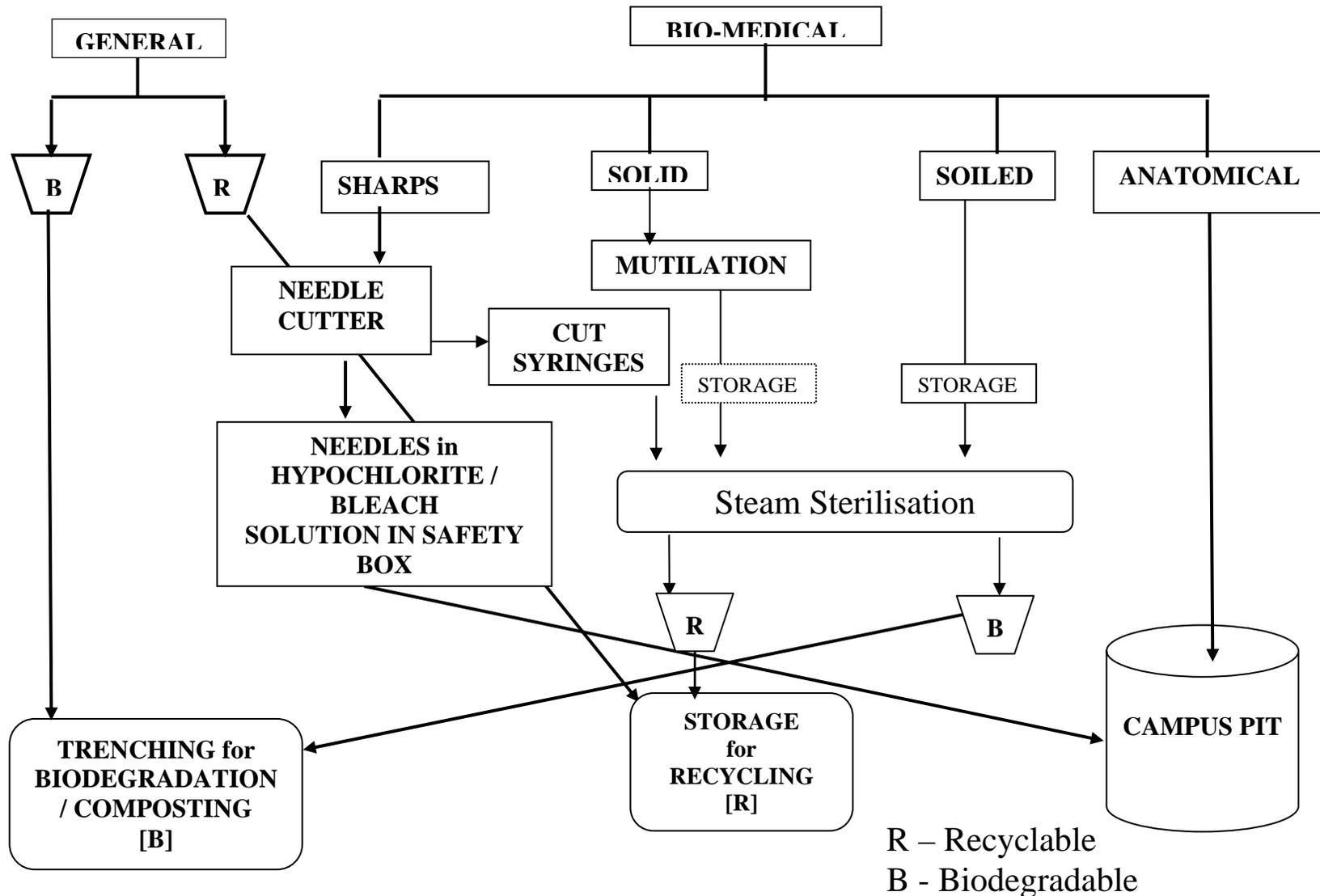
Or

Campus Pit (at remote centres)

c) PHC Level >>

WASTE CATEGORY		OPTIONS		
Bio-Medical		I	II	III
Sharps (cat 4)	Syringe & Needle	Defang >> Put Needles in chemical disinfectant	Campus Pit (Deep Burial)	
	Broken Ampule /glass	Put Broken Ampules/glass in chemical disinfectant with Needles		
Soiled (cat 6)	Dressings, Bandage, Linen etc.	Collect separately	Steam Sterilisation	Trenching for Biodegradation
Solid (cat 7)	Plastic Tubings/Bags; Cut Syringes; Glass Accessories/Bottles etc.	Collect Separately	Steam Sterilisation	Recycling
Anatomical (cat1)	Placenta, Tissue etc.	Collect Separately	Campus Pit (Deep Burial)	
General				
Packs & Papers		Recycling		
Food Residue, Fruit Peels etc.		Trenching for Biodegradation		

FLOW CHART FOR WASTE MANAGEMENT AT PRIMARY HEALTH CENTRE LEVEL



NOTES FOR PRIMARY HEALTH CENTRE:

Primary Health Centres may be bedded or non-bedded. The bed strength is generally below 10.

PHCs generally have one SC operating either in or adjacent to their premises. PHCs also operate special health camps (eye operation, ligation etc.)

Bio-Medical Waste generated at bedded PHCs per day amounts to a maximum of 250gms Sharps, 700gms Solid, 1,200 gms Soiled and 400 gms Anatomical waste.

Non-bedded PHCs also have provision for child delivery.

PHCs may have Chemical Disinfection and / or Steam Sterilisation as treatment options and trench and campus (burial) pits as disposal options.

With steam steriliser and campus pits bedded and non-bedded PHCs may be developed as sites for CTFs.

Materials and Facilities required for BMWM:

1. Steam Steriliser / Autoclave
2. Needle Cutter.
3. Safety Box to decontaminate and carry cut needles.
4. Trolleys for carrying General and Bio-Medical Waste.
5. Bags & Bins
6. Chemical Disinfectant
7. PPE for handler.

Personnel Available for BMWM:

Cleaning Staff – 2-3
PHN – 1
HA (F) – 1
HA (M) - 1
Health Volunteer – 1

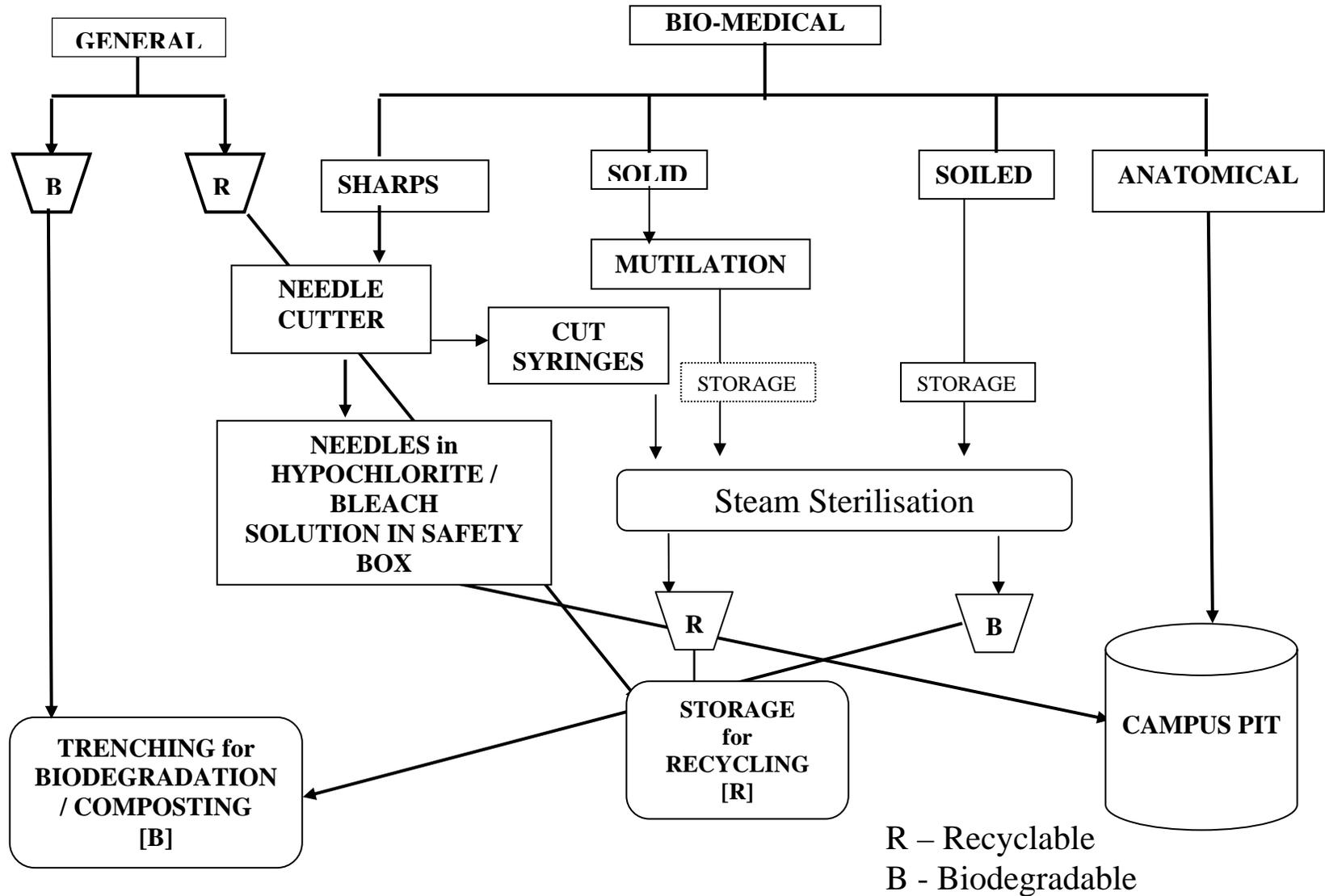
Constructions Required:

1. Campus Pit
2. Housing for Steam Steriliser / Autoclave
3. Vats for Untreated Infectious Waste
4. Storage for General and Treated Recyclable Waste
5. Tank for treatment of Liquid Waste
6. Trench for General and Treated Bio-degradable Waste.

d) BPHC Level >>

WASTE CATEGORY		OPTIONS		
Bio-Medical		I	II	III
Sharps (cat 4)	Syringe & Needle	Defang >> Put cut Needles in Safety Box for chemical disinfection	Campus Pit	
	Broken Ampule / glass	Put Broken Ampules / glass in chemical disinfectant with Needles in Safety Box		
Soiled (cat 6)	Dressings, Bandage, Linen etc.	Collect separately	Steam Sterilisation	Trenching for Biodegradation
Solid (cat 7)	Plastic Tubings/Bags; Cut Syringes; Glass Accessories/Bottles etc.	Collect Separately	Steam Sterilisation	Recycling / Storage for deferred Recycling
Anatomical (cat1)	Placenta, Tissue etc.	Collect Separately	Campus Pit	
General				
Recyclables		Recycling / Storage for deferred Recycling		
Compostables		Trenching for Biodegradation		

FLOW CHART FOR WASTE MANAGEMENT AT BLOCK PRIMARY HEALTH CENTRE LEVEL



NOTES FOR BLOCK PRIMARY HEALTH CENTRE:

Block Primary Health Centres generally have bed strengths around 20. (BPHCs are going to be upgraded to RH with at least 30 beds in near future)

BPHCs generally have one SC operating either in or adjacent to their premises.

Bio-Medical Waste generated at BPHCs per day amounts to a maximum of 500gms Sharps, 1,000gms Solid, 2,000gms Soiled and 1,100 gms Anatomical waste.

BPHCs may have chemical disinfection and steam sterilisation as treatment options and trench, sharp pits and campus (burial) pits as disposal options.

With steam sterilizers and campus pits BPHCs may be developed as sites for CTFs.

Materials and Facilities required for BMWM:

1. Steam Steriliser / Autoclave
2. Needle Cutter.
3. Safety Box to decontaminate and carry cut needles.
4. Trolleys for carrying General and Bio-Medical Waste.
5. Bags & Bins
6. Chemical Disinfectant
7. PPE for handler.

Personnel Available for BMWM:

- Cleaning Staff – 2-3
BPHN – 1
Sister in Charge – 1
HA (F) – 1
HA (M) - 1
Health Volunteer – 1

Constructions Required:

7. Campus Pit
8. Housing for Steam Steriliser / Autoclave
9. Vats for Untreated Infectious Waste
10. Storage for General and Treated Recyclable Waste
11. Tank for treatment of Liquid Waste
12. Trench for General and Treated Bio-degradable Waste.

II. Options for transportation of BMW as and when necessary

A. (Sample Format for ORS)

From	Item	Container	To	Distance	Carrier	Transport	Frequency	Cost / Trip
ORS	1. Cut Needles & Ampoules	Safety Box	SC _y	X Kms.	HA (F) / HA (M) / Health Volunteer	Cycle, Van Rickshaw, Auto, Bus, Boat	Every ORS	Rs..../-
	2. Cut Syringes & Used Vaccine Vials after CD	Container						
	3. Cotton Swabs after CD							

B. (Sample Format for SC)

From	Item	To	Distance	Carrier	Transport	Frequency	Cost / Trip
SC	1. Cut Needles & Ampoules in Safety Box after CD	GP Hqr. Sub-Centre Sharp Pit OR Nearest Disposal Site. Campus Pit(RH/BPHC/PHC)	X Kms.	HA (F) / Health Volunteer	Cycle, Van Rickshaw, Auto, Bus, Boat	Once in a Week	Rs..../-
	2. Cut Syringes & Vaccine Vials in Container after CD	Nearest disposal site (RH/BPHC/PHC)	Y Kms.	HA (F) / HA (M) / Health Volunteer	Cycle, Van Rickshaw, Auto, Bus, Boat		Rs..../-

C. (Sample Format for PHC)

From	Item	To	Distance	Carrier	Transport	Frequency	Cost / Trip
PHC	1. Solid Waste: (Cut Syringes, Vials, Tubings etc. (if no treatment and disposal options available))	Nearest Treatment & Disposal Site. (RH/BPHC/PHC)	X Kms.	Cleaning Staff / Hauling Staff	Authorised Vehicle for BMW Transport	Every Day / Every Other Day	Rs..../-
	2. Soiled Waste: Cotton, Bandage etc. (if no treatment and disposal options available)	Nearest Treatment & Disposal Site. (RH/BPHC/PHC)	Y Kms.				Rs..../-

III. Options for methods of treatment and final disposal of BMW

- By Waste Category

Sl. No.	Waste Category	Treatment Options	Final Disposal Options
1	Sharps	Chemical Disinfection	Sharp Pit / Campus Pit
2	Soiled	Chemical Disinfection / Steam Sterilisation	Trenching (biodegradation) / Deep Burial (if not treated)
3	Solid	Chemical Disinfection / Steam Sterilisation	Recycling / Storage for deferred Recycling / Trenching
4	Anatomical	-- -- --	Campus Pit

- By HCU

HCU	Treatment Options	Final Disposal Options
ORS	Chemical Disinfection (for Sharps, Solid & Soiled waste)	Sharp Pit and / or Campus Pit at nearest disposal site.
SC	Chemical Disinfection (for Sharps, Solid & Soiled waste)	Sharp Pit and / or Campus Pit at SC or nearest disposal site.
PHC	Chemical Disinfection (for Sharps); Steam Sterilisation (for Sharps, Solid & Soiled waste)	Campus Pit for Anatomical Waste and Sharps; Trenching for treated Soiled waste; Recycling / Storage for deferred Recycling / Trenching for treated and general recyclable waste..
BPHC	Chemical Disinfection (for Sharps); Steam Sterilisation (for Sharps, Solid & Soiled waste).	Campus Pit for Anatomical Waste & Sharps; Trenching for treated and general biodegradable waste; Recycling / Storage for deferred Recycling.

Common Treatment Facilities (CTFs) are to be opted for wherever feasible. Chemically treated but uncapped used vaccine vials and chemically treated used syringes cut from the hub should be stem sterilised to ensure proper decontamination.

IV. Options for the location of final disposal of BMW

Bio-Medical Waste	Final Disposal Locations
Decontaminated Cotton Swabs from ORS and SC	At concerned SC or at nearest available site in sharp/campus pit.
Decontaminated Sharps from ORS and SC	At the nearest available sharp pit / campus pit (SC/PHC/BPHC/RH/Others)
Decontaminated Cut Syringes and used Vials from ORS and SC	At the nearest available recycling facility / Storage for deferred recycling / trenching site
Decontaminated Soiled Waste from PHC	At the place of generation in Trench near treatment facility
Decontaminated Solid Waste from PHC	At the trenching site or recycling facility after treatment
Decontaminated Sharps from PHC	At the place of generation in Campus Pit
Anatomical Waste from PHC	At the place of generation in Campus Pit.
Decontaminated Soiled Waste from BPHC	At the place of generation in Trench
Decontaminated Solid Waste from BPHC	At the place of generation through recycling facility / Storage for deferred recycling / trenching site
Decontaminated Sharps from BPHC	At the place of generation in Campus Pit
Anatomical Waste from BPHC	At the place of generation in Campus Pit.

A combination of disposal sites is to be opted for with a view to ensure proper treatment and disposal on the one hand and to minimize transportation on the other depending on the load of generated waste as well as availability of treatment and disposal facilities.

V. Options for adopting a System for Procurement

A checklist is to be prepared indicating requirement of HCWM equipments and materials, costs, requisitioning and procurement authorities for necessary resource allocation and distribution of procurement responsibilities.

BPHC/PHC/SC (Sample Format)

Sl. No.	Item	Quantity Required One time / annual / quarterly	Cost	Source of Fund	Requisitioning Authority	Procurement Authority
1	Autoclave					
2	Common Steriliser					
3	Needle Cutter					
4	Trolley					
5	Bins					
6	Bags					
7	Chemical Disinfectant					
8	Safety Box					
9	Container for cut Syringes & used Vials					
10	Kit Bag to carry waste management tools					
11	Personal Protective Equipments					

- It is suggested that to ensure easy procurement and maintain quality of materials local procurement should be encouraged with prescribed specifications and enlisted accredited suppliers. [Autoclaves may be an exception and may be procured at the district level]
- Procedures for requisition, procurement and supply are to be clearly indicated.
- Necessary formats for requisition; procurement and supply along with record keeping are to be provided.

VI. Options for Authorisation

- By the Bio-Medical Waste (Management and Handling) Rules, 1998 all the BPHCs and PHCs will have to apply for authorization in Form 1 (Ref: BMW Rules) from the WBPCB as they attend to more than 1000 patients in a month.
- Every authorised health care unit will have to submit annual report to the prescribed authority in Form 11 (Ref: BMW Rules) by 31st January every year.
- Concerned BMOH / Medical Officer-in-Charge is responsible to apply for authorisation and also to submit annual report in Form 2 (Ref: BMW Rules).
- Separate authorisation will be required for transportation (if necessary) of BMW from PHC to BPHC/RH and Common Treatment Facilities (if developed) at BPHCs/RHs.
- Consent to establish and operate may be required for Common Treatment Facilities (if developed) at BPHCs/RHs.
- Accidents will have to be reported to the WBPCB by the authorised person in Form 3 (Ref: BMW Rules).
- Considering large number of Rural HCUs in a district, the district H&FW authorities will have to facilitate and monitor the process of authorisation and submission of annual report.

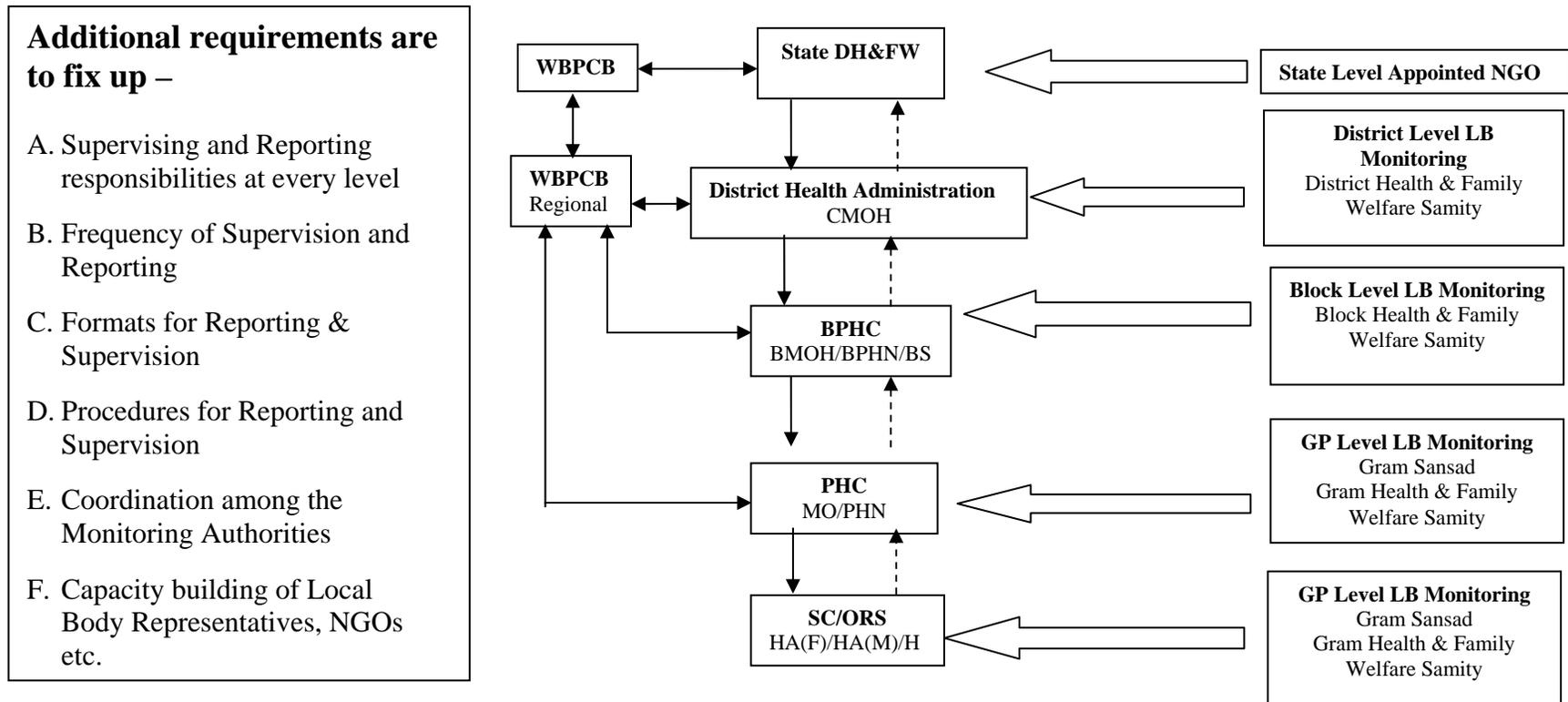
[Form 1, 2 & 3 (Ref: BMW Rules) are given in Annexure XVIII]

VII. Options for monitoring safe disposal of BMW

A three-level monitoring system is suggested to ensure legal compliance, administrative surveillance and social watchdog action.

The principal monitors involved in the process are West Bengal Pollution Control Board (State & Regional Offices), Department of Health & Family Welfare West Bengal (State, District & Block level Health Administration) and the Joint Committees with Local Bodies (District Health & Family Welfare Samity, Block Health & Family Welfare Samity and Gram Health & Family Welfare Samity). NGOs to be engaged at various levels by the principal monitors.

Monitoring entails supervision and reporting – A system of supervision and reporting is to be developed with different tiers and monitoring authorities. The adjoining figure represents a suggested flow chart:



An appropriate system of monitoring has to be adopted involving all HCUs and CTFs in the service area with clear instructions regarding formats and frequencies of monitoring and reporting, responsibilities and authorities of concerned levels of the H&FW Department, Local Government and Regulating Bodies, etc.

Three Level Monitoring

WBPCB	Statutory Authority to authorize and monitor bio-medical waste management
H & FW Deptt.	Owner of HCUs. The onus of application for Authorisation and Reporting rests on HCU in-charge
Local Body with NGO	Major stakeholders. Panchayet as local government. Rogi Kalyan Samity as beneficiary body. NGO as civil society representative. H & FW Samity may function as a joint body of HCU, Local Govt. and NGO representatives.

Responsibilities of Health Care Waste Management Cell at the District Hqrs.

- A. Review of Documents to be submitted by all RH, BPHC, PHC In-Charge:**
 - 1. Copy of Application for Authorisation**
 - 2. Copy of Annual Report**
 - 3. Monthly Report**
 - 4. Observations and recommendations of Task Force on BMWM**
 - 5. Observations and recommendations on BMWM of H & FW Samity**

- B. Regular Inspection: It is suggested that BMWM be made a part of the regular inspection of the HCU by District H&FW Departmental Authorities. While inspecting they should take up the following:**
 - 1. Nodal areas of BMWM noted in a prescribed format of inspection report**
 - 2. Issues detected through review of submitted documents and site visits**

- C. Special instructions and administrative steps as and when required:**
 - 1. Filling up vacancies**
 - 2. Sorting out bottlenecks**
 - 3. Ensuring compliance**

Responsibilities of Panchayet (Local Government) and H&FW Samities*

1. At each level the Panchayet Bodies and H&FW Samities should make BMWM in the HCU under their jurisdiction a regular agenda
2. They should function as Social Monitors
3. Bottlenecks, if any, should be reported to responsible higher authorities as and when necessary.

Responsibilities and Tools related to three tier monitoring of BMWM at HCU level.

Super/BMOH/MOIC		In-House Monitoring				Legal Monitoring		Civil Society Monitoring	
		BMW In-Charge (WMI)		Task Force		WBPCB		H&FW Samity, NGO etc.	
Responsibility	Tools	Responsibility	Tools	Responsibility	Tools	Responsibility	Tools	Responsibility	Tools
Overall Charge / Apply for Authorisation / Annual Return Submission / Coordination among monitoring authorities and implementers	Administrative Steps / Occasional physical inspection / Inspection of registers & records	Daily Running / Trouble Shooting / Coordination / Maintain Stock Register & Records/ Necessary Reporting / Monthly Report	Daily inspection / Stock Register / BMW Record Keeping	Policy Decisions / Supervision / Leading role in BMWM	Inspection / Monthly Meetings	Monitor Rules Compliance / Issue Authorisation / Accept Annual Returns / Issue Instructions / Report to CPCB	Inspection / Scrutinise authorization application & annual returns / Legal actions	Take stock of BMWM / Identify focal areas / Give directions / Help mobilize public awareness and participation	Monthly meeting / Inspection of BMWM including stock and records / Public Meetings & Campaign

*** Special attention is to be given to ensure Panchayet, H&FW Samity and NGO participation. This will call for Capacity Building of these participants. Adopting a suitable programme for capacity building is cardinal.**

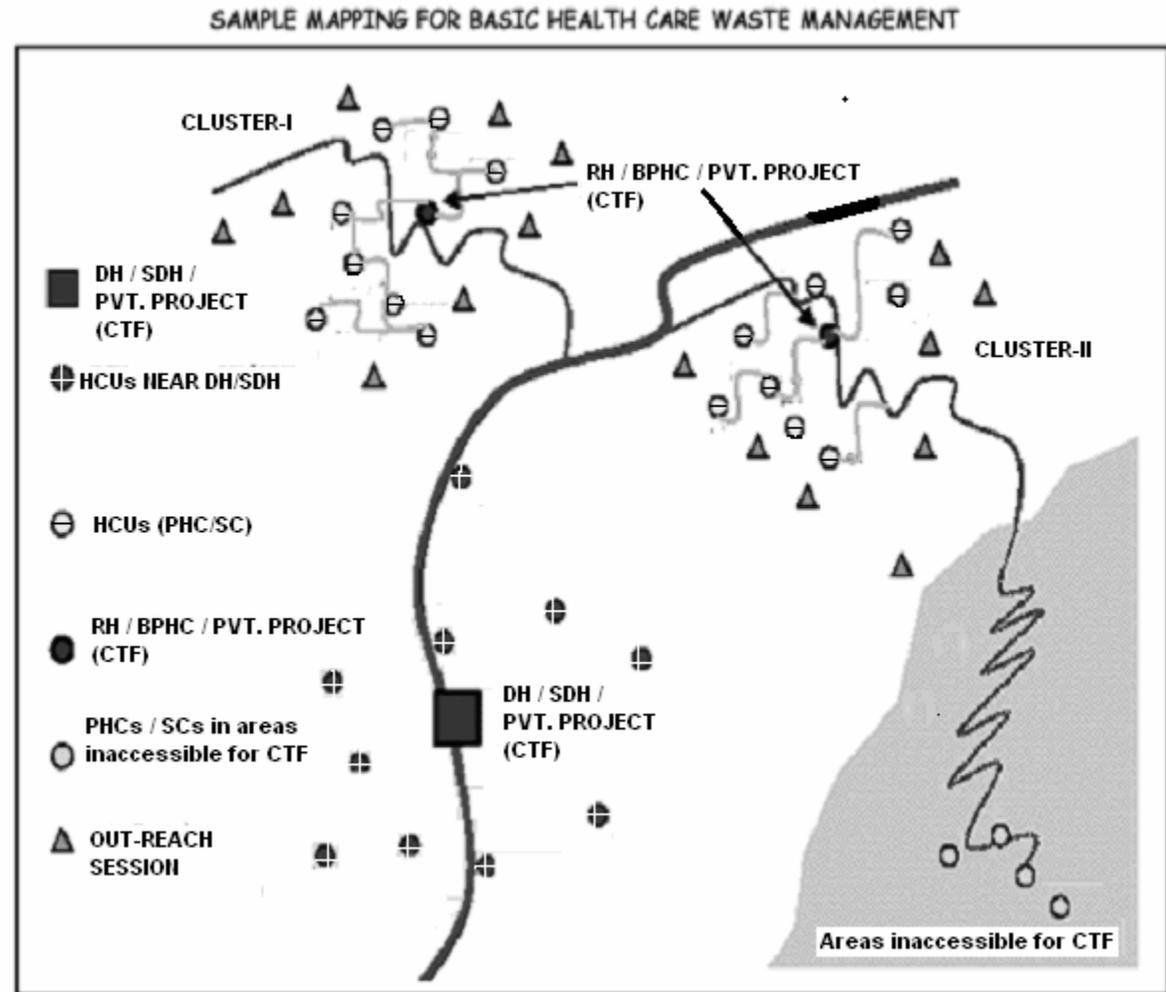
Formats for Reporting & Supervision: Specimen formats for reporting and supervision are given in Annexure XIII & Annexure XIV

Step 2: Collection of Data and Map of the District

Designing right disposal system for each health facility (ORS, SC, PHC & BPHC) of a district requires data from all treatment and disposal facilities (nature, types of waste treated, capacity etc.) either already available or in the pipeline in the service area (district). Thus information regarding treatment and disposal facilities already installed or to be installed for CTFs and/or individual HCUs should be taken into account with a view to utilize capacities already installed.

Next, these available (or to be available) facilities should be located in a map together with all health care facilities, waste to be treated/disposed through CTFs or otherwise and the constraints of transport (distance, road condition with seasonal variation, availability of carriers etc.).

With this information, it is possible to designate disposal options for different situations in the service area.



Step 3: Identifying facilities having access to treatment and disposal options at present

An assessment report is to be prepared identifying the treatment and disposal options available at present and the health care units that may have access to those –

(Sample Format)

Treatment & Disposal Options Available at Present	Capacity	Place	HCUs that may have access to the facilities
Autoclave			
Microwave			
Burial / Campus Pit			
Sharp Pit			
.....			

Step 4: Planning Upgradation of Present Treatment and Disposal Facilities

(Upgrading existing facilities as CTFs)

An Upgradation Plan is to be prepared to develop CTFs by way of providing additional facilities to the existing ones.

(Sample Format)

Place	Treatment & Disposal Options Available	Existing Capacity	HCU's to be Under Coverage	Additional Requirement of Capacity	Proposed Capacity Upgradation	Final Capacity
DH	Autoclave, Burial Pit Vat	10Kg/cycle 4,000 Ltrs. 400 Cft.	PHC _x , SC _a , SC _e , SC _f , ORS _b , ORS _c ..			
SDH _x	Microwave, Burial Pit	3.5 Kg/cycle 3,000 Ltrs.	PHC _y , SC _c , SC _d , SC _g , ORS _a , ORS _e ..		Vat-400 Cft.	
SDH _y	Burial Pit	3,000 Ltrs.	BPHC _a , PHC _z , SC _b , SC _h , SC _j , ORS _d , ORS _f ..		Autoclave- 10Kg/cycle Vat-250 Cft	
RH _x	Campus Pit	2,000 Ltrs.			Autoclave- 5Kg/cycle Vat-125 Cft	
SC _x	None	--			Sharp Pit- 0.300 m ³	

Step 5: Identifying strategic locations for new treatment and disposal facilities (New CTFs)

Strategic locations for developing new CTFs are to be identified in consideration of scope for maximum coverage, accessibility, infrastructure etc.

(Sample Format)

Place	Treatment & Disposal Options	Capacity	HCUs Under Coverage
BPHC _X	Autoclave	12 Kgs/day	PHC _X , SC _A , SC _C , SC _M , SC _V , ORS _U ,
	Burial Pit	3,000 ltrs.	

Step 6: Determining the best Treatment & Disposal Systems for the Remaining HCUs

Some HCUs may be left out of the reach of the proposed CTFs. These will require self contained waste management plans. A list of such HCUs with proposed options is to be prepared.

(Sample Format)

HCUs	Treatment & Disposal Systems Proposed for Waste Categories				
	Sharps	Soiled	Solid	Anatomical	General
PHC _X					
SC _K					
SC _G					

Step 7: Drawing Full Coverage Plan For Treatment and Disposal of BMW

On the basis of the foregoing exercises of identifying and upgrading existing facilities and locating new facilities for CTFS as well as determining the options for remaining facilities a Full Coverage Plan is to be developed for all the HCUs.

- CTFs (Sample Format)

Common Facilities for Treatment & Disposal	HCUs Under Coverage	Weekly Quantity of BMW for		Capacities for	
		Autoclaving	Deep Burial	Autoclave	Campus Pit
CTF ₁	BPHC _X , PHC _Y , SC _N , SC _Z , SC _F , SC _D , SC _J ,				
CTF ₂					
CTF ₃					

- Single Units (Sample Format)

HCUs	Treatment & Disposal Facilities				Campus Pit
	Chemical Disinfection	Autoclave	Pressurised Boiling	Sharp Pit	
ORS _A	√	×	×	×	×
ORS _B	√	×	×	×	×
ORS _C	√	×	×	×	×
SC _X	√	×	√	√	×
SC _Y	√	×	√	×	×
PHC _M	√	√	×	√	√
PHC _N	√	×	√	×	√

Step 8: Fixing jobs, responsibilities and time frame of the District Plan, and drawing cost of its implementation

Areas – Activities – Responsibilities – Time Frame – Costs (Sample Format)

Sl. No.	Area	Activity	Responsibilities	Time Frame	Costs
1	Guidelines	Formulation of Composite Guidelines			
2	Integrated Plan	Development of Integrated Plan			
3	Standards & Designs	Formulation of Standards & Designs for materials, equipments and constructions			
4	Model/Pilot Areas	Selection of Model/Pilot Areas			
5	Implementation of Pilots	Running the show in the selected areas to test its efficacies and SWOT analysis			
6	Training Module	Development of a comprehensive Training Module			
7	Training Activities	<ul style="list-style-type: none"> • Training the Trainers • Training the HCU Level Waste Handlers & Managers 			
8	Installation & Procurement	Installation of: Autoclaves / Common Sterilizers, Campus (Burial) and/or Sharp Pits, liquid waste treatment tank, trenches, vats and storage facilities. Procurement of: Bags & Bins, Needle cutters/pullers, Chemical Disinfectants with containers, Safety Boxes, PPEs, Trolleys, Pressure Cookers.			
9	Monitoring & Evaluation	Developing an integrated Monitoring & Evaluation System			
10	Total Cost				

Annual Requirement of Facilities, Equipments & Materials (Sample Format)

Facilities & Equipments	ORS			SC			PHC (Non-Bedded)			PHC (Bedded)			BPHC/RH			Total
	Nos./ Qty.	Unit Cost	Value	Nos./ Qty.	Unit Cost	Value	Nos./ Qty.	Unit Cost	Value	Nos./ Qty.	Unit Cost	Value	Nos./ Qty.	Unit Cost	Value	
Autoclave																
Steam Steriliser																
Vats & Storage Facility																
Liquid Treatment Tank																
Waste Treatment Room																
Campus Pit																
Trench																
TOTAL																

Facilities & Equipments	ORS			SC			PHC (Non-Bedded)			PHC (Bedded)			BPHC/RH			Total
	Nos./ Qty.	Unit Cost	Value	Nos./ Qty.	Unit Cost	Value	Nos./ Qty.	Unit Cost	Value	Nos./ Qty.	Unit Cost	Value	Nos./ Qty.	Unit Cost	Value	
Needle Cutters																
Trolleys																
Bags & Bins																
Chemical Disinfectants																
Safety Box (sharps)																
Safety Container (others)																
PPEs																
TOTAL																

Costs One Time & Recurring (Sample Format)

HCU	One Time	Recurring	Total Cost
ORS			
SC			
PHC (Non-Bedded)			
PHC (Bedded)			
BPHC			
RH			
Total Cost			

Step 9: Capacity Building (Training)

❖ Training objectives:

Successful implementation of the strategy action plan on health care waste management for basic health care system in rural West Bengal calls for empowering various target groups directly or indirectly associated with the implementation activities with appropriate knowledge, skill and attitude on health care waste management. The course structure and focus of training could vary depending on the background and function of each target group.

On completion of the course, participants will be in a position to:-

◆ *Knowledge*

- Describe the sources, composition and characteristics of hospital wastes and the likely health hazards from improper management of hospital wastes.
- Explain the techniques and practices for effective management of hospital waste, covering collection, segregation, minimisation, storage and handling, transportation, treatment and disposal of hospital waste.
- Explain the socio-economic dimensions and legal requirements in the context of hospital waste.

◆ *Skill*

- Initiate action for facilitating safe collection, treatment, transportation and disposal of hospital waste.
- Evaluate and streamline hospital waste management practices and procedures.
- Identify factors relevant for planning and implementing hospital waste management systems for a region.

◆ *Attitude*

- Consistently promote safe practices and systematic approaches for the collection, storage and handling, segregation, transportation, treatment and disposal of hospital wastes.

❖ Target Groups for Training on HCWM

The target groups for training on HCWM can be identified as follows:

- Decision makers and Authorities involved with developing policies and look after implementation at the State level
- Decision makers and Authorities involved with developing policies and look after implementation at the State level
- Hospital administrators and other administrators at institutional level
- Representatives and officials of Local Self Government agencies
- Representatives and officials of Public Works and Public Health Engineering Departments
- Medical Officers, Nursing Staff, Pharmacists, Lab Technicians, Health Assistants in charge of Sub-Centres
- Workers associated with handling health care waste
- Environmental Health professionals, NGOs
- Manufacturers and vendors of health care waste management equipments, consumables and chemicals

❖ Identifying Training Requirements:

1. Training should be construed as a part and enhancement of a continuous learning environment that makes it possible to muster necessary knowledge and put it into practice.
2. Training (knowledge and skill) requirements for different kinds (levels) of jobs and the personnel assigned to respective jobs have to be ascertained [Training Need Assessment (TNA) Exercise].
3. While ascertaining the training requirements future developmental needs are to be accounted for.
4. Training lay out should include training delivery methods, facilitators, courseware (manual, games, slide presentation, film, IEC materials etc.).
5. Training initiative should ensure alignment of HCU level activities with the overall objectives and requirements of the basic health care system-wide BMWM requirements.
6. Training should identify areas for self-development: develop and implement tools for continuous self-improvement.

❖ **Training Needs Assessment (TNA)**

Training Needs Assessment Objectives

The reasons for doing training needs assessment is: -

- To determine whether any training is needed
- To determine the areas in which training is needed
- To determine the gap to be bridged
- To determine desired training outcomes
- To provide a basis of monitoring and evaluation

Training Need Assessment Methodology

1. Consultation with Deptt. of H&FW and officials in HCU on deficiency - in the BMW services and gap in their capabilities to take corrective measures.
2. Training Need Assessment Survey among HCU Officials
3. Experts Opinion on BMW Training Needs
4. Analyzing Target Group Specific Training Needs
5. Assessment of Institutional Capabilities to provide Training
6. Validation of Training Needs

Existing Training Delivery Framework and its use

1. What it is and how does it deliver?
2. Assessment of its capability to meet the training needs?
3. Identifying the initiatives necessary to institutionalise necessary training delivery
4. Planning training of trainers

❖ **District Personnel Training Requirement Table**

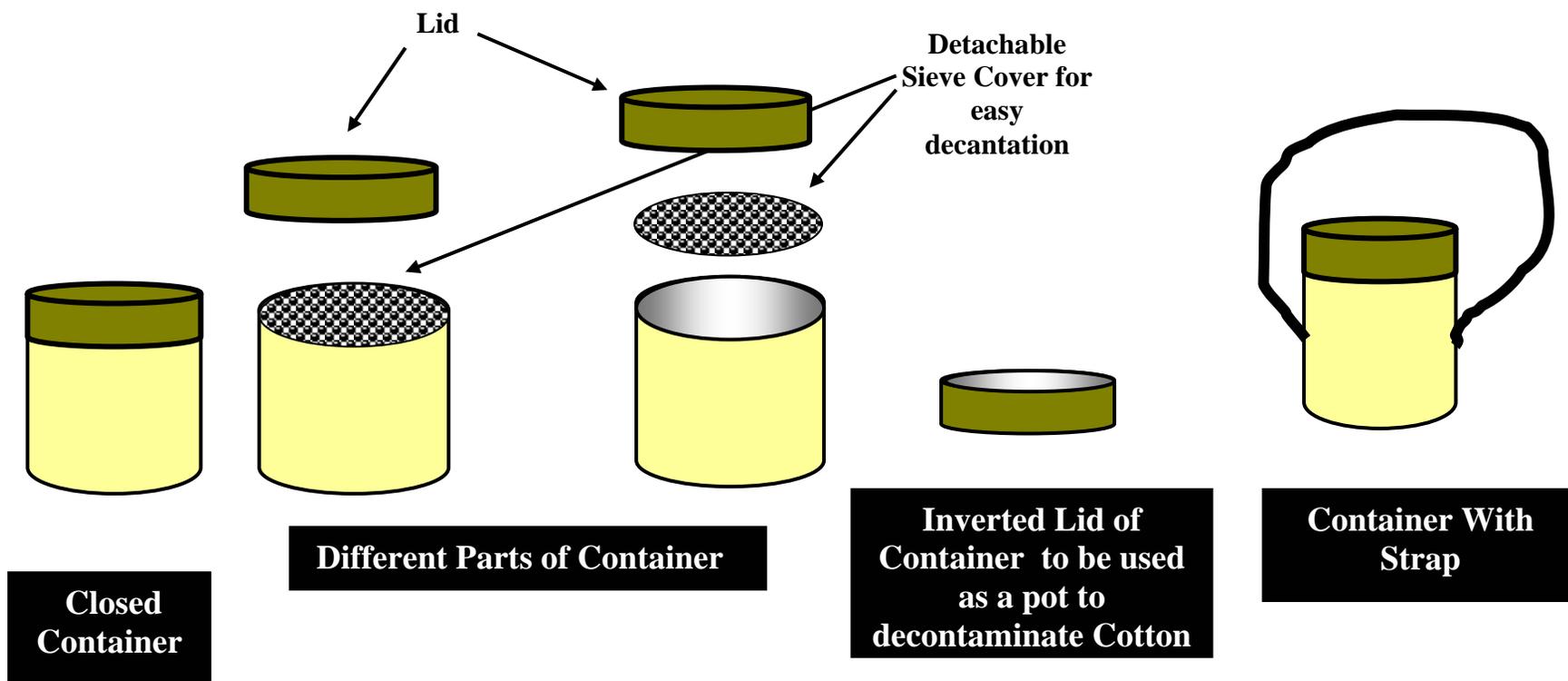
<div style="text-align: center;"> Generic Job Categories </div> <div style="text-align: center;"> Training Items </div>	Waste Manager [Level 1]	Waste Manager [Level 2]	HCWM Monitors (extnl)	Record Keeper [Level 1]	Record Keeper [Level 2]	Record Keeper [Level 3]	Waste Handler [Level 1]	Waste Handler [Level 2]	Waste Handler [Level 3]	Waste Handler [Level 4]	Waste Carrier [Level 1]	Waste Carrier [Level 2]
	1	2	3	4	5	6	7	8	9	10	11	12
BMW: What it is; Why & How to be managed	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Regulations	✓	✓	✓									
Categories of BMW	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Collection of BMW at BPHC & PHC	✓	✓	✓				✓	✓	✓		✓	
Collection of BMW at SC & ORS	✓	✓	✓							✓		✓
Use of PPE	✓	✓	✓						✓	✓		
Display of IEC	✓	✓	✓									
Communication with patients and patient parties	✓	✓	✓				✓	✓	✓	✓		
Use of Needle Cutter and Safety Box for Sharps	✓	✓	✓				✓	✓		✓		
Use of Safety Container for Cut Syringes & Used Vials	✓	✓	✓							✓		
Transport from PHC to BPHC / CTF (optional)	✓	✓	✓				✓	✓	✓		✓	
Transport from ORS to SC	✓	✓	✓							✓		✓
Transport from SC to BPHC / CTF (optional)	✓	✓	✓							✓		✓
Storage of infectious recyclables and compostables	✓	✓	✓						✓			
Storage of decontaminated and general recyclables	✓	✓	✓						✓			
Treatment with Autoclave / Common Steriliser	✓	✓	✓						✓			
Treatment with Chemical Disinfectant	✓	✓	✓				✓		✓	✓		
Treatment of liquid waste	✓	✓	✓						✓			
Procurement	✓	✓	✓									
Monitoring & Evaluation	✓	✓	✓									
Capacity Building Follow-up	✓	✓	✓									

❑ **Training Requirements of Bio-Medical Waste Management System for Basic Health Care in Rural Waste Bengal comprising of BPHCs, PHCs, SCs and ORS Centres. This table has been developed to be representative of an average system. Job categories and associated training requirements in a particular area may be specified with reference to this lay out and may not be fully identical with those presented in this table.**

Officials and Staff included in respective Generic Job Categories

1. **Waste Manager [Level 1]** : Responsible for the overall Basic Health Care waste management at the State and District level. [State level officials; CMOH and/or ACMOH in the District]
2. **Waste Manager [Level 2]** : Responsible for the overall Basic Health Care waste management at the HCU level. [BMOH, MO in Charge and WMI, HA in Charge at SC]
3. **HCWM Monitors [External]** : Health and Family Welfare Society members, Rogi Kalyan Samity Members, WBPCB
4. **Record Keeper [Level 1]** : Responsible for Record Keeping for BMWM at the District level. [Responsible Clerk at CMOH Office]
5. **Record Keeper [Level 2]** : Responsible for Record Keeping for BMWM at the District level. [Responsible Clerk at BMOH Office, WMI at BPHC and PHC,]
6. **Record Keeper [Level 3]** : Responsible for Record Keeping for BMWM at the SC level. [HA in Charge]
7. **Waste Handler [Level 1]** : Responsible for Primary Collection (treatment) [Doctors and Nurses attached to BPHCs and PHCs]
8. **Waste Handler [Level 2]** : Responsible for Primary Collection (Investigation & Medicine Distribution) [Lab Technicians and Pharmacists attached to BPHCs and PHCs]
9. **Waste Handler [Level 3]** : Responsible for Secondary Collection, Treatment and Disposal [Cleaning Staff and General Duty Attendants attached to BPHCs and PHCs, Autoclave or Common Steam Sterilizer Operator (Hospital staff or private operator)]
10. **Waste Handler [Level 4]** : Responsible for Primary Collection, Treatment and Disposal [HA (female) in Charge of SCs and associated staff/volunteers - HA (male), Health Guide/Volunteer, Health Supervisor]
11. **Waste Carrier [Level 1]** : Transporter of waste from PHC to BPHC / CTF (optional) [Hospital staff or private operator]
12. **Waste Carrier [Level 2]** : Transporter of waste from ORS to SC and from SC to Hqr. SC and / or BPHC. [HA in Charge of SCs, other carriers like Linkman, Health Volunteer etc.]

ANNEXURE – I : Container for Decontaminating and Carrying Cut Syringes, Used Vaccine Vials and Cotton Swabs

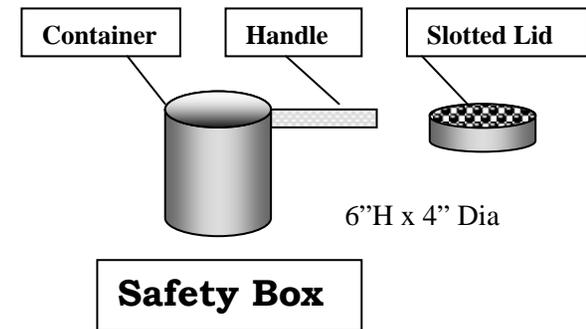


The Container is to serve multiple purposes. The body of the cylindrical box may be used as a pot to decontaminate cut syringes and used vaccine vials by filling it with decontaminating solution and dipping the cut syringes and used vials into it. The lid, when inverted, may be used as another pot to decontaminate cotton swabs by filling it with decontaminating solution and dipping the cotton swabs into it. After decontamination the hypo-chlorite/bleach solution will be drained out. A detachable sieve cover that fits in between the lid and the body of the safety box helps in pouring out the used decontaminant.

Total Height: 18 cms. Diameter: 12 cms. Lid Height: 3 cms.

ANNEXURE – II : NEEDLE CUTTER / REMOVER AND SAFETY BOX

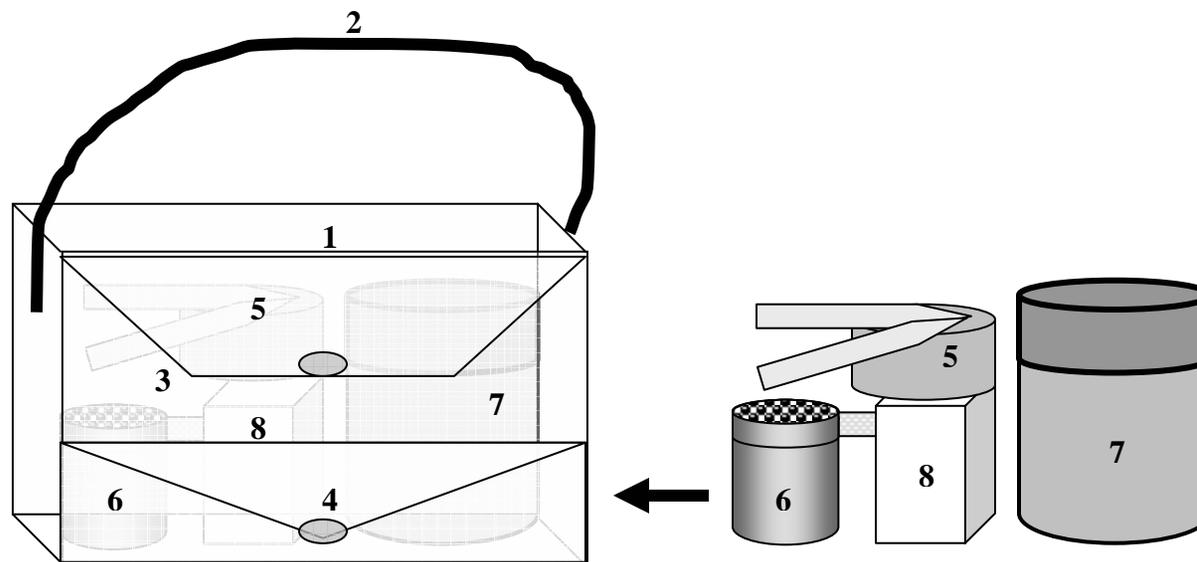
- A good quality needle cutter/remover costs Rs.1,500 – Rs.2,000. (approx)
- Every person giving injection should have needle cutter/remover close at hand.
- Syringes should be defanged immediately after use, carrying used syringes to needle cutter/remover has a high risk of needle-stick injury.
- A Safety Box may be attached below the needle cutter to collect the cut needles. This detachable container may be used to decontaminate the cut needles with chemical decontaminant. Broken ampoules may also be collected and treated in the same container. These decontaminated sharps may be finally disposed in a sharp or campus pit.
Cost Rs. 100/- (approx)



◆ **The Safety Box for cut needles and broken ampoules, Needle Cutter and the Container for cut syringes, used vials and cotton swabs may be carried in a single small Kit Bag to and from the Out Reach Session Centres.**

ANNEXURE – III : BMW TOOL KIT FOR ORS

Decontaminated cut syringes and used vials together with cotton swabs may be carried back in the Safety Box from Out-Reach Session Centers to respective Sub-Centres.



1. **TOOL KIT** – To hold and carry all tools and BMW for & from ORS
2. **STRAP** – Attached to TOOL KIT
3. **MAIN CHAMBER** – Of the TOOL KIT
4. **POUCH POCKET** – To hold and carry the general (packaging) waste from ORS
5. **NEEDLE CUTTER** – To defang syringes
6. **SAFETY BOX** – To disinfect, hold and carry cut needles
7. **CONTAINER** – To hold, disinfect and carry cut syringes, used vials and soiled cotton swabs
8. **BLEACHING POWDER PACK** – To provide bleaching powder for prepare bleach solution

Specification: Made of durable synthetic cloth. Measurement - Length: 35 cms. ; Width: 12.5 cms; Height: 20 cms.
Cost Rs.150/- approx.

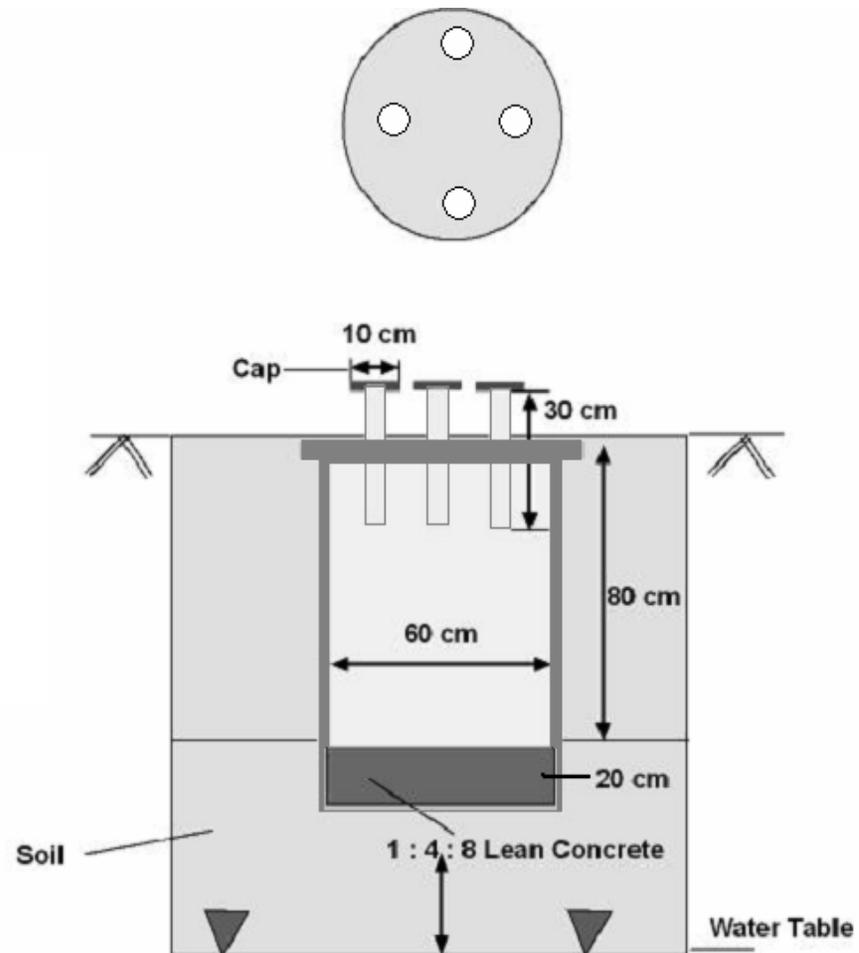
ANNEXURE – IV : SHARP PIT

Underground Sharp Pit with Hume pipes

Caps to have locking facility

Capacity about 2,13,500 needles
(Taking 100 needles per week the pit will be sufficient for more than 40 years.)

Costing Rs.3000/- to 3500/-

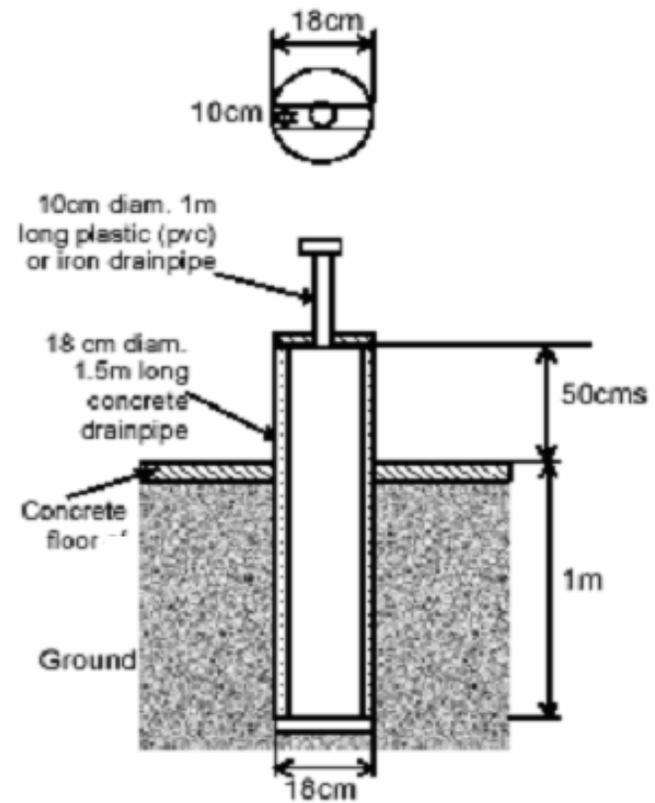


A smaller variety of sharp pit may be constructed by utilizing simple concrete drainpipe as shown in the figure.

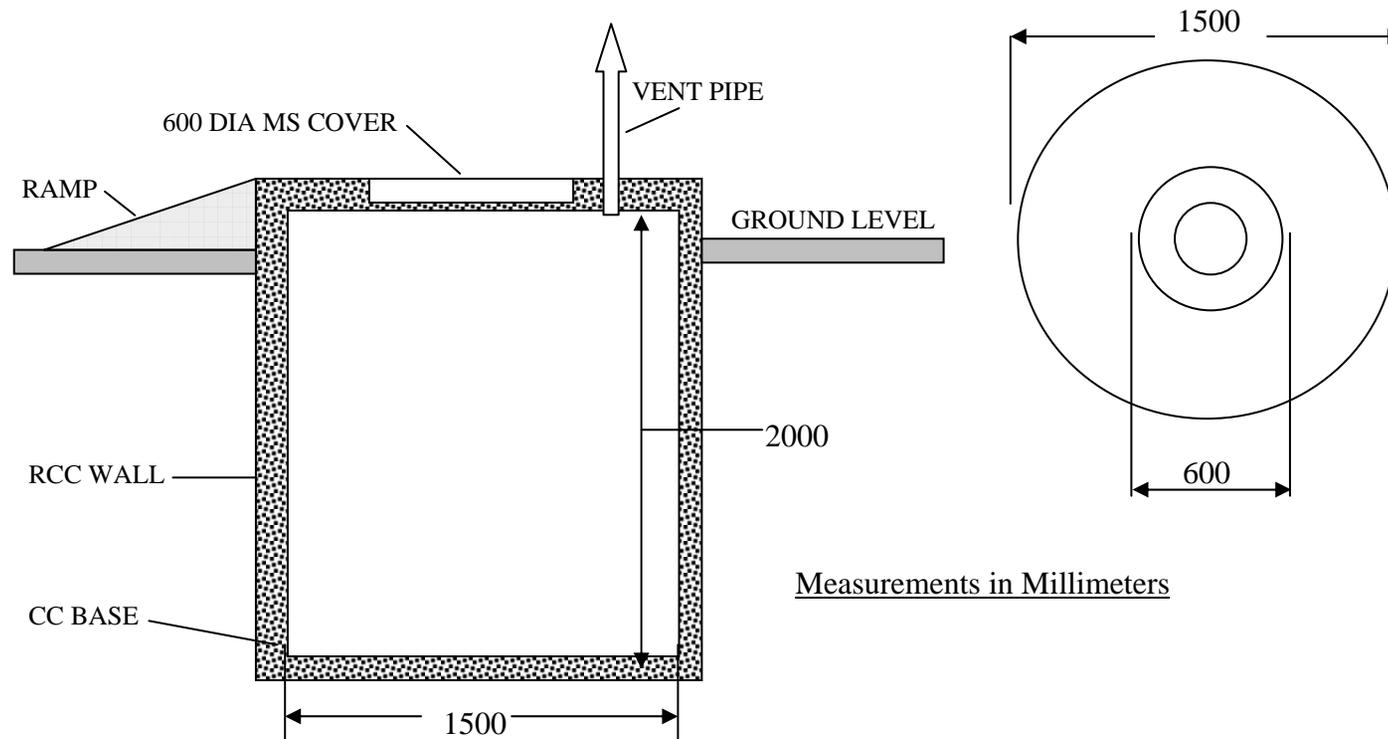
Caps to have locking facility

Capacity about 36,000 needles
(Taking 100 needles per week the pit will be sufficient for 6.5 years.)

Costing Rs. 2,000/- to Rs. 2,500/-



ANNEXURE -V : CAMPUS (BURIAL) PIT



Capacity about 3.5 m³. Sufficient for at least 40 years if only sharps (100 needles and 20 ampoules per day) and anatomical waste (5 placentas per day) are disposed in it.

Cost Rs. 15,000/-

ANNEXURE – VI: AUTOCLAVES & COMMON STEAM STERILISERS



Small Autoclaves with recording facility:

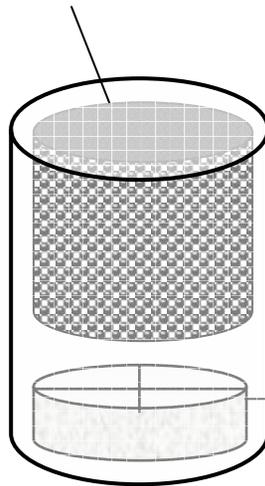
SIZE	CHAMBER VOLUME (Lit.)	PROCESSING CAPACITY/CHARGE	PRICE Ex-Factory
400 Dia.X 600 Lg. mm	77	7.7 Kg.	Rs.1,60,000/-
400 Dia.X 900 Lg. mm	115	11.5 Kg.	Rs.2,00,000/-

Shredder:

CAPACITY	PRICE
25 Kg./Hr.	Rs.1,30,000/-



WASTE HOLDER WITH LID



BUFFER

Common Steam Sterilizers without recording facility:

SIZE	PROCESSING CAPACITY/CHARGE	PRICE
10Litres	3 - 5 Kg.	Rs.9,000/- - Rs.12,000/-

The Time and Pressure of the cycle may be recorded manually in an operation register.

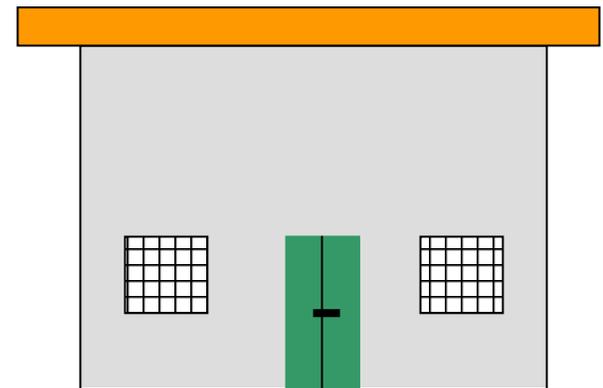
ANNEXURE – VII: WASTE STERILISATION HOUSING

A room for waste treatment/sterilisation will be necessary for housing and operating the Autoclave or Steriliser.

Suggested Specifications:

- **Doors with locking facility**
- **Ventilation: Windows for cross ventilation (secured with grills)**
- **Size: Sufficient to house the autoclave and the shredder with easy manoeuvring space[12ft (l) x 10ft (w) x 10ft (h) (minimum)]**
- **Approach: Built up [concrete or cement-brick] for easy manoeuvring of hand-trolley**
- **Construction: Concrete floor, cement-brick wall with RCC roofing**
- **Location: Behind and away from the hospital building, adjacent to pre and post treatment storage facility**
- **Caution: Seasonal inundation to be considered in choosing the location and base height**

Cost: Rs. 25,000 – 30,000 Approx.



ANNEXURE – VIII: Trolleys

Trolleys are required for transportation of waste from containers placed at generation point to temporary storage / treatment facility and also to disposal site (if within campus). Bio-Medical waste should be carried in dedicated (red) trolleys marked with bio-hazard symbol. General waste to be carried in trolleys without bio-hazard symbol.

Trolleys should be sized according to the quantity of waste they are supposed to carry. Trolleys should be easy to use, i.e. their movement, loading, unloading and cleaning should be user friendly.

Double wheel tripod type traveling trolley; fitted with cover, preferably with rubber-lined wheel for infectious waste. Maximum size 3'Lx2'Wx1.5'H. Cost Rs.3,500/- approx.

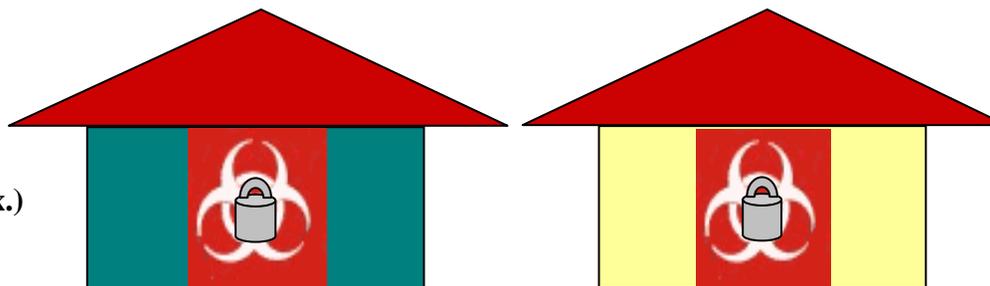


ANNEXURE – IX: Vats for Infectious Recyclable and Non-Recyclable Waste before treatment

Vats are necessary for temporary storage of waste before treatment. They should be well protected to debar scavengers and foraging animals, with easy approach and located near the place for waste treatment and away from the place of medical treatment. There should be arrangement for regular supply of water for washing.

There should be two vats: one each for infectious recyclable and non-recyclable waste. Another option is to have a double chamber vat.

Cost: Rs.7,000/- each (approx.)

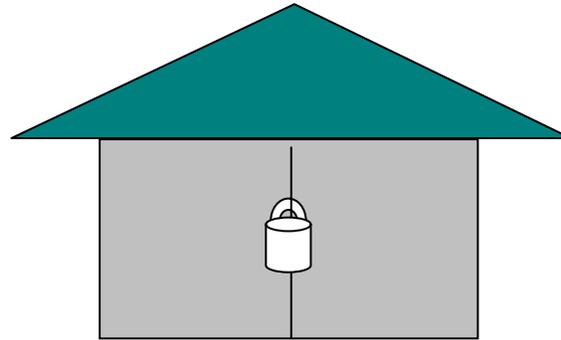


Suggested Specifications:

- **Separate Facilities for Recyclables and Non-Recyclables**
- **Different Colour for easy identification (in conformity with colour of collection bags/bins for Recyclables and Non-Recyclables)**
- **Marking with bio-hazard symbol**
- **Doors with locking facility**
- **Covered/Shaded**
- **Water and drainage facility**
- **Ventilation (wire meshing at upper side of the wall)**
- **Size: 6ft (l) x 6ft (w) x 6ft (h) [minimum]**
- **Approach: Built up [concrete or cement-brick] for easy manoeuvring of hand-trolley**
- **Construction: Concrete floor, cement-brick wall with wire meshing at upper side, fiber-plastic shade**
- **Location: Behind and away from the hospital building, adjacent to treatment and after treatment storage facility**
- **Caution: Seasonal inundation to be considered in choosing the location and base height**

ANNEXURE –X: Storage Facility for Treated (decontaminated) Recyclable and General Recyclable Waste

Storage Facility is necessary for temporary storage of treated recyclable waste and general recyclable waste before sending those for recycling. They should be well protected to debar scavengers and foraging animals, with easy approach and located near the place for waste treatment and away from the place of medical treatment. There should be arrangement for regular supply of water for washing.



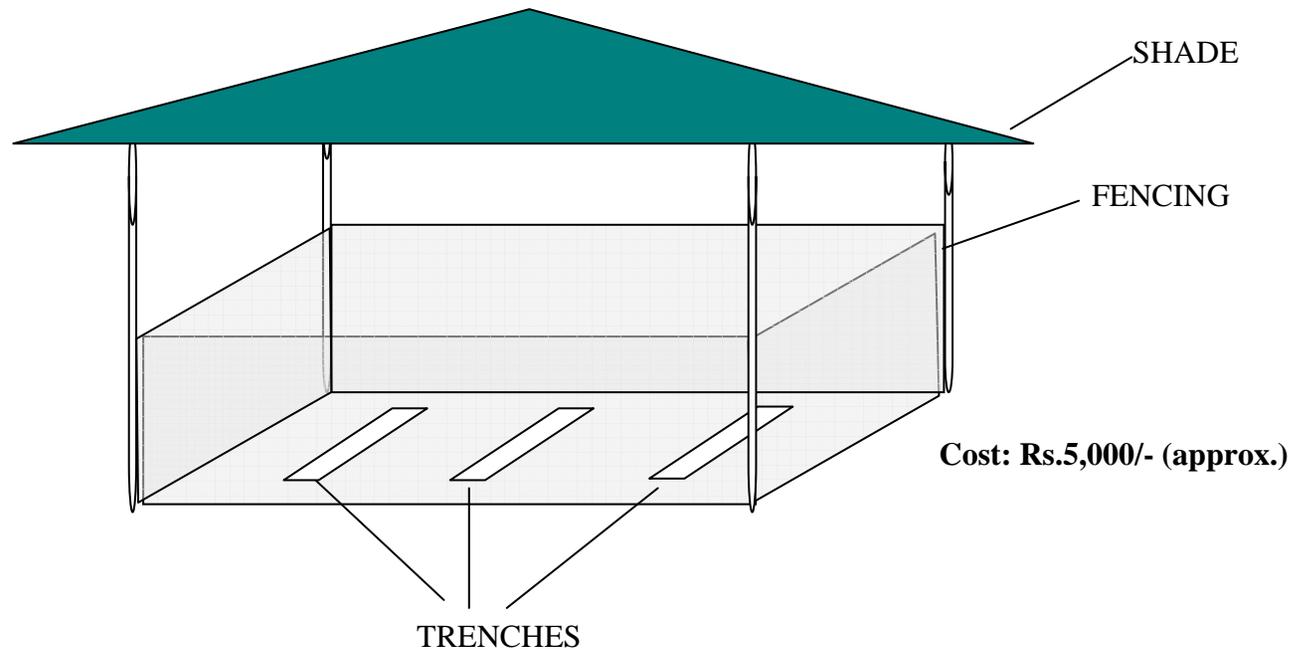
Suggested Specifications:

- Doors with locking facility
- Covered/Shaded
- Ventilation (wire meshing at upper side of the wall)
- Water and drainage facility
- Size: 10ft (l) x 10ft (w) x 6ft (h) [minimum]
- Approach: Built up [concrete or cement-brick] for easy manoeuvring of hand-trolley
- Construction: Concrete floor, cement-brick wall with wire meshing at upper side, fiber-plastic shade
- Location: Behind and away from the hospital building, adjacent to treatment facility
- Caution: Seasonal inundation to be considered in choosing the location and base height

Cost: Rs.7,000/- (approx.)

ANNEXURE – XI: Trench for Bio-Degradation

Trenches are required for systematic bio-degradation of bio-degradable waste. A system of trenches secured with fencing and shade is the suggested option.

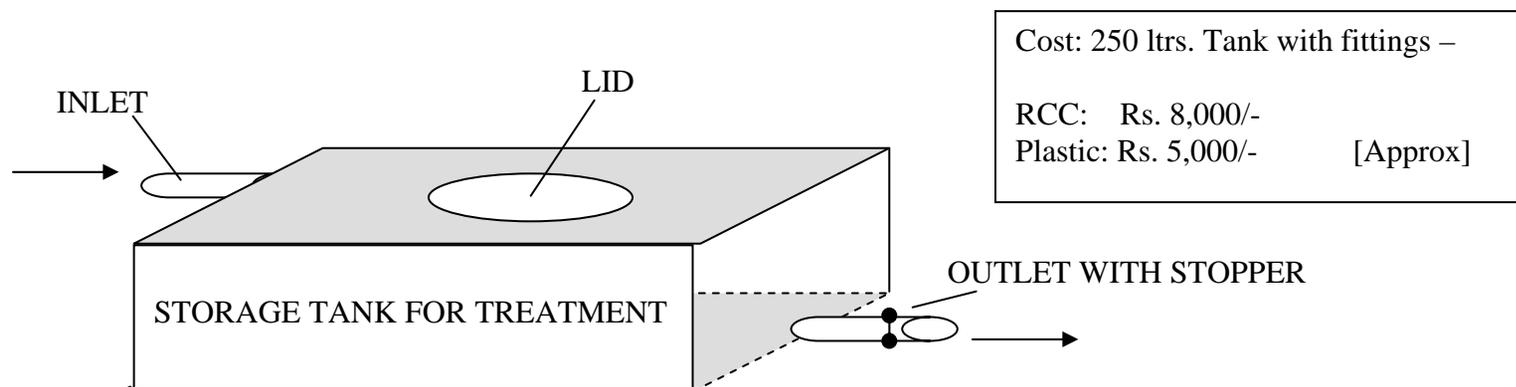


Suggested Specifications:

- To be housed in covered and fenced off space
- Three trenches to be accommodated
- Size: Trench 6ft(l) x 3ft (w) x 3ft (h). Shade Covered Area 16ft (l) x 8ft (w)
- Approach: Built up [concrete or cement-brick] for easy manoeuvring of hand-trolley
- Location: Behind and away from the hospital building,
- Caution: Seasonal inundation to be considered in choosing the location and base height

ANNEXURE –XII: Storage and Treatment Facility for of infectious liquid waste before release in drain.

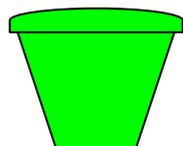
A storage cum treatment tank will be necessary for treating the contaminated waste water with chemical decontaminant. These tanks may be made of either RCC or plastic.



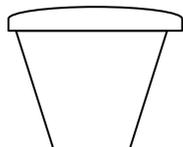
Suggested Specifications:

- **To be connected separately with Pathological Laboratory and/or Delivery Room/O.T. Upper inlet and lower outlet, outlet to have stopper Sufficiently large lid for letting in decontaminant and periodic cleaning**
- **Size: 250 Ltrs. Minimum.**
- **Approach: Built up [concrete or cement-brick] for easy manoeuvring of hand-trolley**
- **Construction: RCC or HDPE (Syntex Type)**
- **Location: Adjacent to the hospital building, nearest to Pathological Laboratory and/or Delivery Room/O.T.**
- **Caution: Seasonal inundation to be considered in choosing the location and base height**

ANNEXURE –XIII: BAGS & BINS



**GENERAL
(non-recyclable)**
[green]



**GENERAL
(recyclable)**
[white/off-white]



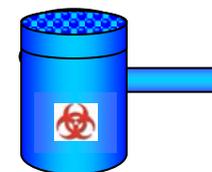
**INFECTIOUS
(non-recyclable)**
[red]



**INFECTIOUS
(recyclable)**
[blue]



ANATOMICAL
[yellow]



Safety Box with biohazard symbol is required to collect and treat waste sharps right after generation. This container will fit under needle cutter.

Suggested Material: Unbreakable translucent plastic.



Bags are not statutory for either general waste or bio-medical waste except in case of wastes for burial in the latter category. In view of huge quantity of plastic waste generated due to the use of plastic bags and their cost, the use of plastic bags may be done away with except in the case of anatomical waste, which is to be disposed in deep burial. Waste containers (bins) will have to be cleaned and disinfected by bleach regularly after use.

Suggested Material: Yellow bag made of high molecular high density polyethylene (HM-HDPE) virgin, thickness: 30 micron; Size: as per requirement

Bins are required to collect the waste at or near generation points. Avoiding multiple handling and facilitating composting and recycling call for segregated collection of recyclables and bio-degradables (non-recyclables). Different coloured bins are to be commissioned to collect separately bio-degradable and recyclable wastes. The bins used to collect bio-medical waste should be marked with bio-hazard symbol as shown in the adjoining figure. Yellow and Blue bins are to be used for anatomical and sharp waste respectively.

Suggested Material: Virgin HDPE, thickness – 2.5mm, capacity – as per requirement, may be with lid and paddle pressure arrangement.

ANNEXURE – XIV: Specimen Format For Record Keeping [Rule 11]

Keeping records of generation, collection, reception, storage, transportations, treatment, disposal and/or any form of handling of bio-medical waste constitute an integral part of compliance to the BMW Rules 1998. It is also an important tool for assessment and monitoring of the system. A specimen format for record keeping is given below:-

Name of the HCU:

Date:

Bio-Medical Waste Category	Generation	Collection	Transportations	Storage	Treatment	Disposal in Sharp Pit	Disposal in Campus Pit	Disposal in Trench	Stored for Recycling
Sharps									
Soiled									
Solid									
Anatomical									
Total									
Authorised Signature by Person Responsible	WMI*	WMI &/Or Operator**	WMI &/Or Operator**	WMI &/Or Operator**	WMI &/Or Operator**				

*WMI: Waste Management In-Charge. ** In case a private operator is employed for the job.

Notes

- In case of CTF “Collection” will include all BMW coming in for treatment.
- There should be arrangement for weighing Bio-Medical Waste at every nodal operational point.
- The Records should be kept open and available for inspection by WBPCB.

ANNEXURE – XV: Specimen Check List for Monitoring

1. Training of Personnel – Whether the concerned personnel have been trained?

HCU	No. & Category of employees handling waste	Persons Trained	Percentage
	Doctors		
	Lab Technician		
	Pharmacist		
	Nurses		
	Cleaning Staff		
	Autoclave Operator		

2. Supply of Provisions – Whether provisions have been supplied?

Items	Date of last Supply	Stock position	Date of last requisition

3. Segregation – Whether the following segregation of waste at source takes place? [Tik & Cross]

BMW				General	
Anatomical	Sharp	Soiled	Solid	Recyclable	Others

4. Sharp Disposal – Whether sharp disposal is done properly?

Needle cut with the hub	Chemically disinfected	Transported in puncture proof Safety Box	Disposed in Sharp Pit / Campus Pit

5. Transportation – Whether BMW transported properly?

Sharps in Puncture proof Safety Box	*Cut Syringe, Used Vials in Carrying Container	*Kit Bag for Safety Box and Carrying Container	Anatomical Waste in Closed Bag	Covered Trolley for in-house transportation	**Covered Vehicle

* For ORS and Sub-Centre ** Where BMW is to be transported from the HCU to CTF.

6. Treatment – Whether treatment of soiled and solid BMW is done?

Items	Autoclave	Microwave	Common Steam Steriliser	Chemical Disinfection
Solid				
Soiled				

7. Disposal – How BMW is disposed of?

BMW	Whether Sterilised	Burial / Campus Pit	Trench	Undesignated Place	Recycling
Anatomical	X				
Soiled					
Solid					

8. Personal Protective Equipment – Whether PPEs have been supplied and used?

Items	Whether Supplied	Whether Used
Gloves		
Masks		
Apron		
Boot		

9. Information , Education and Communication [IEC] Materials -

Whether IEC material has been supplied? Yes No

Whether IEC material has been displayed? Yes No

10. Record Keeping -

Whether Record Keeping is maintained? Yes No

11. Authorisation -

Status of Authorisation Received

 Applied for

 Not Applied

12. Responsibility: Name & Designation of the Person in Charge of Waste Management

13. Whether any Waste Management Committee / Task Force is in place?

Yes No

If yes frequency of its meeting:

14. Monitoring Arrangement

Whether Monthly Reports for BMWWM are

(a) regularly prepared Yes No

(b) and if yes, sent to District Authorities ?
Yes No

15. Monitoring Arrangement

Whether Annual Reports for BMWWM are regularly sent to -

WBPCB Yes No

District Authority Yes No

ANNEXURE – XVI: Cost (Rs.) of HCWM at different categories of HCUs at basic health care level

SUMMARY

One time cost with Annual expenses (for 1st year)

Facility	Civil Works	Equipment with running cost	Consumables	Training & Others	Total
RH	91000	23000	52940	20000	186940
BPHC	76000	23000	26045	17500	142545
PHC(Let us take all as bedded)	71000	13500	16405	3000	103905
Sub-centers (a)	2500		6050	1500	10050
Sub-centers (b)	5000		6050	1500	12550
Sub-centers (c)			6050	1500	7550

Annual recurring expenses

Facility	Maintenance of Civil Works (5%)	Maintenance of Equipment with electricity	Consumables	Refresher Training & Others	Total
RH	4550	3000	35390	10000	52940
BPHC	3800	3000	17345	8750	32895
PHC(Let us take all as bedded)	3550	1500	10145		15195
Sub-centers (a)	125		3700		3825
Sub-centers (b)	250		3700		3950
Sub-centers (c)			3700		3700

Sub-centers (a): with sharp pit; **Sub-centers (b):** with campus pit; **Sub-centers (c):** without any scope for construction.

1. SPECIMEN CONSOLIDATED COSTS FOR IMPLEMENTATION –
Cost Estimates (Rs.) for Implementation of HCWM for RH of 50 Bedded Facility

Consumable Items (yearly)	Unit Cost	Number / Quantity	Total Cost
Yellow bag (22" X 12 ")	4.00	1460	5840.00
Syringe & Needle cutter**	2000.00	8	16000.00
Safety Box**	100.00	8	800.00
Yellow Bin with lid**(18"x 12")	150.00	6	900.00
Other Bins with lids**(20"x 14")	170.00	20	3400.00
Gloves	10.00	400	4000.00
Mask	15.00	150	2250.00
Gumboot	200.00	20	4000.00
Apron	100.00	10	1000.00
Trolley for internal transport**	3500.00	4	14000.00
Bleaching powder in kg	25.00	30	750.00
A. Total Consumables			52940.00

Construction	Total Cost
Trench* x 1	5000.00
Campus Pit* x 2	30000.00
Vat* x 2	14000.00
Storage x 1	7000.00
Waste Treatment Room	30000.00
Liquid Treatment Tank	5000.00
B. Total Construction	91000.00
Equipment	
Steam Sterilizer (Rs. 20000) & Electricity	23000.00
C. Total Equipment	23000.00
Training and Others	
Training Rs. 250 X 60	15000.00
Compliance Cost (BCC)	5000.00
D. Total Trg & Others***	20000.00

* Cost of Campus Pit and Trench may be excluded if already constructed in RH.

** 50 % replacement cost for following years *** 50% for refresher training and others on following years

2. SPECIMEN CONSOLIDATED COSTS FOR IMPLEMENTATION –
Cost Estimates (Rs.) for Implementation of HCWM for BPHC of 30 Bedded Facility

Consumable Items (yearly)	Unit Cost	Number / Quantity	Total Cost
Yellow bag (22" X 12 ")	4.00	730	2920.00
Syringe & Needle cutter*	2000.00	4	8000.00
Safety Box*	100.00	4	400.00
Yellow Bin with lid*(18" x 12")	150.00	2	300.00
Other Bins with lids*(20"x 14")	170.00	10	1700.00
Gloves	10.00	150	1500.00
Mask	15.00	75	1125.00
Gumboot	200.00	10	2000.00
Apron	100.00	6	600.00
Trolley for internal transport*	3500.00	2	7000.00
Bleaching powder in kg	25.00	20	500.00
A. Total Consumables			26045.00

Construction	Total Cost
Trench x 1	5000.00
Campus Pit x 1	15000.00
Vat x 2	14000.00
Storage x 1	7000.00
Waste Treatment Room	30000.00
Liquid Treatment Tank	5000.00
B. Total Construction	76000.00
Equipment	
Steam Sterilizer (Rs. 20000) & Electricity	23000.00
C. Total Equipment	23000.00
Training and Others	
Training Rs. 250 X 50	12500.00
Compliance Cost (BCC)	5000.00
C. Total Trg. & Others**	17500.00

* 50 % replacement cost for following years ** 50% for refresher training and others on following years

3. SPECIMEN CONSOLIDATED COSTS FOR IMPLEMENTATION –
Cost Estimates (Rs.) for Implementation of HCWM for PHC of 10 Bedded Facility

Consumable Items (yearly)	Unit Cost	Number / Quantity	Total Cost
Yellow bag (22" X 12 ")	4.00	365	1460.00
Syringe & Needle cutter*	2000.00	2	4000.00
Safety Box*	100.00	2	200.00
Yellow Bin with lid*(18'' x 12'')	150.00	2	300.00
Other Bins with lids*(20''x 14'')	170.00	6	1020.00
Gloves	10.00	60	600.00
Mask	15.00	30	450.00
Gumboot	200.00	4	800.00
Apron	100.00	2	200.00
Trolley for internal transport*	3500.00	2	7000.00
Bleaching powder in kg	15.00	25	375.00
A. Total Consumables			16405.00

* 50 % replacement cost for following years

Construction	Total Cost
Trench x 1	5000.00
Campus Pit x 1	15000.00
Vat x 2	14000.00
Storage x 1	7000.00
Waste Treatment Room	25000.00
Liquid Treatment Tank	5000.00
B. Total Construction	71000.00
Equipment	
Steam Sterilizer (Rs. 12000) & Electricity	13500.00
C. Total Equipment	13500.00
Others	
Compliance Cost (BCC)	3000.00
D. Total Others	3000.00

4(a). SPECIMEN CONSOLIDATED COSTS FOR IMPLEMENTATION –
Cost Estimates (Rs.) for Implementation of HCWM at a Sub-Centre (including ORS)
where sharp pit can be constructed and recyclables can be transported to
Vaccine Distribution Centres

Consumable Items (yearly)	Unit Cost	Number / Quantity	Total Cost
Syringe & Needle cutter*	2000.00	2	4000.00
Container*	150.00	2	300.00
Safety Box*	100.00	2	200.00
Kit Bag*	100.00	2	200.00
Glove	10.00	60	600.00
Mask	15.00	30	450.00
Apron	100.00	2	200.00
Bleaching powder in kgs	25.00	4	100.00
A. Total Consumables			6050.00

Construction	Total Cost
Sharp Pit	2500.00
B. Total Construction	2500.00

Others	
Compliance Cost (BCC)	1500.00
C. Total others	1500.00

* 50 % replacement cost for following years

4(b). SPECIMEN CONSOLIDATED COSTS FOR IMPLEMENTATION –
Cost Estimates (Rs.) for Implementation of HCWM at a Sub-Centre (including ORS)
where campus pit can be constructed and recyclables cannot be transported to
Vaccine Distribution Centres

Consumable Items (yearly)	Unit Cost	Number / Quantity	Total Cost
Syringe & Needle cutter	2000.00	2	4000.00
Container	150.00	2	300.00
Safety Box	100.00	2	200.00
Kit Bag	100.00	2	200.00
Glove	10.00	60	600.00
Mask	15.00	30	450.00
Apron	100.00	2	200.00
Bleaching powder in kgs	25.00	4	100.00
A. Total Consumables			6050.00

Construction	Total Cost
Campus Pit	5000.00
B. Total Construction	5000.00

Others	
Compliance Cost (BCC)	1500.00
C. Total others	1500.00

* 50 % replacement cost for following years

4(c). SPECIMEN CONSOLIDATED COSTS FOR IMPLEMENTATION –
Cost Estimates (Rs.) for Implementation of HCWM at a Sub-Centre (including ORS)
where no construction can be done and all waste have to be transported to
Vaccine Distribution Centres

Consumable Items (yearly)	Unit Cost	Number / Quantity	Total Cost
Syringe & Needle cutter*	2000.00	2	4000.00
Container*	150.00	2	300.00
Safety Box*	100.00	2	200.00
Kit Bag*	100.00	2	200.00
Glove	10.00	60	600.00
Mask	15.00	30	450.00
Apron	100.00	2	200.00
Bleaching powder in kgs	25.00	4	100.00
A. Total Consumables			6050.00

Others	
Compliance Cost (BCC)	1500.00
C. Total others	1500.00

- 50 % replacement cost for following years

**If Autoclave is installed at RH and BPHCs
Sterilizer Cost to be replaced by the following Cost (Rs.)**

One time cost with Annual expenses (for 1st year)

Items with Autoclave	Unit cost	Number / Quantity	Total Cost
Autoclave	200000.00	1	200000
Autoclavable Bag Yearly	6.00	800	4800
Jute Bag for Autoclave	5.00	400	2000
Electricity 730 Units	5.00		3650
Grease for autoclave in kgs	125.00	6	750
D. Total Autoclave			229200

Annual recurring expenses for following years

AMC for Autoclave	20000.00	1	20000.00
Autoclavable Bag Yearly	6.00	800	4800.00
Jute Bag for Autoclave	5.00	400	2000.00
Electricity 730 Units	5.00		3650.00
Grease for autoclave in kgs	125.00	6	750.00
D. Total Autoclave			231200

ANNEXURE –XVII: LABEL FOR TRANSPORT OF BIO-MEDICAL WASTE CONTAINERS/BAGS

SCHEDULE IV

(see Rule 6)

LABEL FOR TRANSPORT OF BIO-MEDICAL WASTE CONTAINERS/BAGS

Day Month
Year
Date of generation

Waste category No

Waste class

Waste description

Sender's Name & Address

Phone No

Telex No

Fax No

Contact Person

In case of emergency please contact

Name & Address :

Phone No.

Receiver's Name & Address

Phone No

Telex No

Fax No

Contact Person

Note : Label shall be non-washable and prominently visible.

ANNEXURE –XVIII: FORMS FOR AUTHORISATION, ANNUAL REPORT, ACCIDENT REPORTING

FORM I

(see rule 8)

APPLICATION FOR AUTHORISATION

(To be submitted in duplicate.)

To

The Prescribed Authority
(Name of the State Govt/UT Administration)
Address.

1. Particulars of Applicant

- (i) Name of the Applicant
(In block letters & in full)
- (ii) Name of the Institution:
Address:
Tele No., Fax No. Telex No.

2. Activity for which authorisation is sought:

- (i) Generation
- (ii) Collection
- (iii) Reception
- (iv) Storage
- (v) Transportation
- (vi) Treatment
- (vii) Disposal
- (viii) Any other form of handling

3. Please state whether applying for resh authorisation or for renewal:

(In case of renewal previous authorisation-number and date)

4. (i) Address of the institution handling bio-medical wastes:
(ii) Address of the place of the treatment facility:
(iii) Address of the place of disposal of the waste:
5. (i) Mode of transportation (in any) of bio-medical waste:
(ii) Mode(s) of treatment:
6. Brief description of method of treatment and disposal (attach details):
7. (i) Category (see Schedule 1) of waste to be handled
(ii) Quantity of waste (category-wise) to be handled per month

8. Declaration

I do hereby declare that the statements made and information given above are true to the best of my knowledge and belief and that I have not concealed any information.

I do also hereby undertake to provide any further information sought by the prescribed authority in relation to these rules and to fulfill any conditions stipulated by the prescribed authority.

Date :

Signature of the Applicant

Place :

Designation of the Applicant

FORM II
(see rule 10)
ANNUAL REPORT

(To be submitted to the prescribed authority by 31 January every year).

1 . Particulars of the applicant:

(i) Name of the authorised person (occupier/operator):

(ii) Name of the institution:

Address

Tel. No

Telex No.

Fax No.

2. Categories of waste generated and quantity on a monthly average basis:

3. Brief details of the treatment facility:

In case of off-site facility:

(i) Name of the operator

(ii) Name and address of the facility:

Tel. No., Telex No., Fax No.

4. Category-wise quantity of waste treated:

5. Mode of treatment with details:

6. Any other information:

7. Certified that the above report is for the period from

Date Signature

Place..... Designation.....

FORM III
(see Rule 12)
ACCIDENT REPORTING

1. Date and time of accident:
2. Sequence of events leading to accident:
3. The waste involved in accident :
4. Assessment of the effects of the accidents on human health and the environment,.
5. Emergency measures taken
6. Steps taken to alleviate the effects of accidents
7. Steps taken to prevent the recurrence of such an accident

Date

Place.....

Signature

Designation.....

[F.No.23-2/96-HSMD]
VIJAY SHARMA, Jt.Secy.

ANNEXURE –XX: Mercury Waste Management

Although specifically not mentioned in any category of waste in the BMW Rules, mercury waste is often generated in health care units due to breakage of mercury instruments like mercury thermometer, sphygmomanometer etc. and spills occur. Mercury is potentially very hazardous for human health and environment.

Reduction / Replacement

Any safe procedure for disposal of mercury is yet unknown. Hence reduction / replacement of mercury containing instruments is the best way out. Procurement policy should be adopted to replace all mercury instruments by electronic and other kind of instruments.

In the event of any mercury spillage due to breakage of instrument the following measures are to be taken: -

Do's

- Remove people and pets from the spill area.
- Close all interior doors to the spill area.
- Turn off heating and air conditioning systems.
- Air out the room. Open all exterior windows and doors. Use fans if they ventilate to the outside.

Dont's

- Do not touch the mercury. Never vacuum; it will release mercury vapor into the air.
- Never use a broom; it will break up the mercury.
- Never pour mercury down the drain.
- Never walk around in contaminated clothing or shoes.
- Never put mercury-contaminated items in the washing machine.

Clean-up Instructions - Spill Management

1. Remove all jewelry, mercury will bind with the metal.
2. Put on rubber or latex gloves.
3. Pour sulphur powder over the spillage area to prevent mercury vaporization before clean up.
4. Pick up broken glass carefully; wrap in a paper towel, and place in a glass container with 5 to 10 ml of water.
5. Use a regular syringe for sucking the mercury droplets. Left out small beads are to be gathered with two cardboards and then scooped.
6. Place in water in the glass container.
7. Locate any remaining mercury with the flashlight; the beads will reflect the light making them easier to see. Pick up any remaining beads and place in water in the glass container.
8. Seal the glass container and label as "mercury waste" and place in a safe corner.
9. Place all materials used in the clean up, including gloves, in a trash bag.
10. Seal the trash bag with tape and label as "mercury waste".
11. Wash the area with mercury neutralizing agents like 20% calcium sulphide or sodium thiosulphate solution.
12. Wash your hands, face, and any other areas of your body exposed to the mercury.
13. Keep the room ventilated for a minimum of 48 hours.

ANNEXURE –XX: INFORMATION-EDUCATION-COMMUNICATION STRATEGY

Objectives of IEC Strategy: Information, Education and Communication is a process that informs, motivates and helps people to adopt and maintain healthy practices and life skills. It aims at empowering individuals and enabling them to make correct decisions about safe health care waste management practices. IEC also attempts to create an environment which is conducive and supports access to equipments and processes necessary for safe and sustainable management of health care waste.

If communication has to be effective it must be in the local language and idiom, keeping in mind social norms, cultural beliefs and sensitivities of the community. Above all communication programmes must give space for interaction, clarifying doubts and addressing misgivings on the issues of the needs, tasks, responsibilities, coordination and achievements.

Components of IEC Strategy: The IEC strategic plan for safe and sustainable management of health care waste for basic health care should include a variety of communication strategies for raising awareness, behavioural change and social mobilization. The IEC strategic plan has the following components:

- ***Use of Mass Media*** – Using the local press and other mass communication media like songs and plays together with reading and display materials like booklets, posters and stickers.
- ***Advocacy at various levels*** – Sensitising both health care workers and persons in other sectors/organisations like Panchayet, Govt. Administrations, Educational Institutions, Rogi Kalyan Samity (Patient Welfare Association), Health and Family Welfare Samity, NGOs, local clubs etc.
- ***Inter-Sectoral collaboration*** – Promoting effective collaboration among various sectors like Government, Panchayet, NGOs etc.
- ***Training*** – Capacity building of all persons involved in management of health care waste through special training programmes [See **Step 9: Capacity Building (Training)**]
- ***Involvement of NGOs*** – Involving NGOs at different levels and in different jobs to further the cause of safe and sustainable management of health care waste.
- ***Research*** - Adopting a process of continuous upgradation of IEC strategy through observation, analysis, reconstitution and application.

ANNEXURE –XXI: MANAGERIAL ASPECTS AT A GLANCE

Proposed management functions at the State level:

	Functions / Responsibilities	Officer responsible
1.	Developing policy guidelines Construction Procurement	State Level Designated Authorities [Jt. Director - Public Health]
2.	Procurement: <ul style="list-style-type: none"> ○ Guidelines on procurement ○ Standard setting ○ Empanelment ○ Procedure for procurement ○ Fund allocation ○ Guidelines on Service Providers 	State Level Designated Authorities [Jt. Director - Public Health & Deputy Director – SPSRC]
3.	Financial: allocation and transfer of funds	State Level Designated Authorities [Jt. Director - Public Health]
4.	Monitoring: Allotment and utilisation funds District Reports on HCWM	State Level Designated Authorities [Jt. Director - Public Health]
5.	Facilitate approval by PCB	State Level Designated Authorities [Jt. Director - Public Health]
6.	Sensitization and training	State Level Training Institute [SIHFW]
7.	Any other issue requiring state level intervention	State Level Designated Authorities [Jt. Director - Public Health]

Proposed management functions at the District level:

	Functions / Responsibilities	Officer responsible
1	Communication	One Nodal Officer will be identified for all the district level activities.
2	Sensitization and training	CMOH
3	Procurement and supply	ACMOH (M&A)
4	Approving and monitoring Service Providers	ACMOH (M&A)
5	Civil work (Local)	PRI / PWD
6	Monitoring: Legal compliance Supervisory visits Compilation of reports/feed back and reporting to state level.	District Monitoring Committee - to include <ul style="list-style-type: none"> o ACMOH M&A o Representative of PCB o Representative of H&FW Samity o Representative of DM office
7	Contract monitoring	CMOH

Proposed management functions at the Institutional level.

	Functions / Responsibilities	Officer responsible
1	Communication of policy	Superintendent / BMOH / MOIC / HA(F)
2	Sensitization and training for - Concerned Block, PHC and Sub-Centre Level BMW Managers & Handlers	BMOH
3	Procurement and supply	Superintendent / BMOH / MOIC / HA(F)
4	Approval of expenditure	Concerned H&FW Samity
5	Financial: Allocation, transfer and utilisation of funds	Block H&FW Samity / Facility In-charge
6	PPP Contract (if any) supervision	Block H&FW Samity / Facility In-charge
7	Monitoring: Constructions Procurement Management & Handling	Superintendent / BMOH / MOIC / HA(F) / Concerned WMI / H&FW Samity
8	Civil work (Local)	PRI / PWD

Detailed operational plan for institutions by category

A. Outreach Session

Functions	Executed by	Equipment / Facility	Monitored by	Construction
Defanging of syringes, segregated collection and treatment of BMWM by bleach solution as per plan (single activity)	HA(F)	Tool kit containing needle cutter, safety box, bleaching Powder/ halogen tablet and container for treated cotton swabs, cut syringes and used vials.	HS	None
Transport of Tool kit with its contents from vaccine delivery point /PHC/S.C. to the outreach and back to the vaccine delivery point along with treated and general waste.	Vaccine carrier/Link person.	Tool Kit containing needle cutter, safety box, container and bleaching powder / sodium hypochlorite solution.	HS	
Disposal (Swab cotton) / sharps / used vials / cut syringes and general waste as per plan at the vaccine delivery point	HA(F) with the help of Vaccine Carrier/Link Person	Sharp Pit for treated sharps. Storage for recycling. Campus Pit at remote centres for all BMW.	HS	
Record keeping	No separate record keeping is necessary as the concerned Health Assistant In-Charge of SC is to keep records			

B. Sub-Centre

Functions	Executed by	Equipment / Facility	Monitored by	Construction
Defanging of syringes, segregated collection and treatment of BMWM by bleach solution as per plan (single activity)	HA(F)	Tool kit containing needle cutter, safety box, bleaching Powder/ halogen tablet and container for treated cotton swabs, cut syringes and used vials.	HS	Sharp Pit Campus Pit (at remote SCs)
Construction of sharp pit / campus pit	Panchayat		BMOH and Pradhan GP	
Disposal - of treated sharps in sharp pit. - of treated cotton swabs (small - quantity) in sharp pit. - of treated recyclables and general waste through storage and sending for recycling - of all treated bio-medical waste in campus pit at remote SCs	HA(F)	Sharp Pit Campus Pit (at remote SCs)	HS	
Transportation of treated and cut syringes and vials to the PHC / BPHC /RH for storage and recycling.	Vaccine carrier / link person from and to vaccine delivery point.	Container/Bag	HS	
Receiving supplies of needle cutter, safety box, container, bleaching powder along with the tool kit.	HA(F)	Keeping Space	HS	
Record keeping: Keeping records of supplies and utilization of consumables	HA(F)	Stock Register	HS	

C. RH/BPHC/PHC (to be modified as per requirement)

Functions	Executed by	Equipment / Facility	Departmental Monitoring by	Construction
<p>Segregated collection of waste as per plan: <i>General waste</i> as Recyclables and Bio-degradables <i>Bio-medical waste</i> as Anatomical, Sharps, Recyclables and Bio-degradables</p> <p>Collection of all waste is to be done twice in a day or as per necessity and stored or disposed of as per the nature of the waste.</p>	<p>Doctor / Nurse / Pharmacist / Lab. Technician / Patients / Attendants</p>	<p>Different coloured Bins:</p> <ol style="list-style-type: none"> 1. Green for general bio-degradables 2. White/off-white for general recyclables 3. Red for infectious bio-degradables 4. Blue for infectious recyclables 5. Yellow for anatomical waste 6. Yellow Bag (for lining yellow bin for anatomical waste); 7. Safety Box for sharps 	<p>WMI: Public Health Manager / BPHN or any other staff identified by the BMOH</p>	<p>None</p>
<p>Defanging of Syringes and chemical treatment of sharps</p>	<p>Nurse / Lab. Technician</p>	<p>Needle cutter, Safety Box, Bleach Solution / Beaching Powder</p>	<p>WMI</p>	<p>None</p>
<p>General Waste in Kitchen (where applicable)</p>	<p>Kitchen in charge(Private)</p>	<p>Green Bin for bio-degradables</p>	<p>WMI</p>	<p>None</p>
<p>Disposal of placenta / tissue</p>	<p>Cleaning Staff</p>	<p>Yellow coloured bin and plastic bags, red trolley with biohazard symbol, campus pit.</p>	<p>WMI</p>	<p>Campus pit</p>
<p>Disposal of sharps</p>	<p>Cleaning Staff</p>	<p>Safety Box, campus pit</p>	<p>WMI</p>	<p>Campus pit</p>
<p>Disposal of biodegradable general waste</p>	<p>Cleaning Staff</p>	<p>Bin, Black Trolley and Trench</p>	<p>WMI</p>	<p>Trench</p>
<p>Disposal of recyclable general waste</p>	<p>Cleaning Staff</p>	<p>Bin, Black Trolley and Store Room / Space for storing before recycling</p>	<p>WMI</p>	<p>Store room/space in the sterilizer room for storing recyclables.</p>
<p>Carrying and storage of non-recyclable infectious waste before treatment</p>	<p>Cleaning Staff</p>	<p>Bin, Red Trolley and vat for infectious biodegradable waste</p>	<p>WMI</p>	<p>Vat (1) for Infectious biodegradables non-recyclables</p>

Carrying and storage of recyclable infectious waste before treatment	Cleaning Staff	Bin, Red Trolley and Vat for infectious recyclable waste	WMI	Vat (2) for infectious recyclable waste
Treatment of Bio-medical waste through sterilizer. 3-4 days/week	Group-D Staff / Outsourced agency	Steriliser	WMI	Room for sterilizer.
Storing general and treated recyclables before recycling	Cleaning Staff	Store room for recyclables.	WMI	Store room for recyclables.
Delivery of stored recyclables for recycling	WMI & Cleaning Staff / Outsourced agency	Weighing Scale	WMI	None
Treatment of liquid waste by bleaching powder in waste water treatment tank	Cleaning Staff	Bleaching Powder, Waste Water Treatment Tank, Soak Pit	WMI	Treatment Tank
Procurement and storing logistics either directly or from the district and issuing on requisition.	BMOH, WMI with the help of Cleaning Staff	Storing Facility, Stock Register and Issue Register.	WMI	Part of the general store may be used for storing logistics related to BMWM
Record keeping of types and quantities of BMW generated.	Clerk/ Engagement of private staff	Register with prescribed format	WMI	None
Application for authorization (Form-I) and submission of annual reports (Form-II) to PCB	BMOH / MOIC	Form-I & II of BMW Rules, Registration fees	CMOH	None
Accident reporting	BMOH	Form-III of BMW Rules,	CMOH	None

- **Monitoring will also be done by the WBPCB [legal compliance] and the Health & Family Welfare Samity [social monitoring] of the concerned level. [Ref: VII. Options for monitoring safe disposal of BMW]**
- **All constructions at RH, BPHC, PHC and SC may be done by the concerned panchayat.**

ANNEXURE – XXII: A NOTE ON PRIVATE INITIATIVES

The Department of Health and Family Welfare, Government of West Bengal has elaborate guidelines regarding engagement of private entrepreneurs for public services. Already some private entrepreneurs are working in the bio-medical waste management sector in West Bengal.

Experiences earned from these practices in West Bengal and similar ones elsewhere should be utilized to identify appropriate options.

Some options may be:

- i. to assign the service area to the private party in such a way as to include both remunerative and non-remunerative sectors [say a whole district with all govt. and non. govt. HCUs by arrangement with the state pollution control board].
- ii. to get some beneficial arrangement for govt. HCUs if space and/or other infrastructures are provided to the private party (Private – Public – Partnership).
- iii. to assign supply of consumables for waste management in HCUs to the private party for smooth running of the system

Areas of Special Attention:

- The private operator will have to get Authorisation from West Bengal Pollution Control Board.
- Smooth coordination with Govt. Authorities and waste handlers and Govt. supervision of the privately run operation is an absolute necessity – this should be constituted in the contract.
- Scope for monitoring by the Health & Family Welfare Samity, Rogi Kalyan Samity etc. should be incorporated in the contract.