



## GLOBAL PROJECT ON HEALTHCARE WASTE



# Establishing and Designing a Central BMWM Treatment Unit Within a Hospital

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# Global project on healthcare waste

- Implementing agency: **United Nations Development Programme**
- Principal cooperating agencies: **World Health Organization & Health Care Without Harm**
- Participating countries: **Argentina, India, Latvia, Lebanon, Philippines, Senegal, Tanzania, and Vietnam**



## Model Facilities: Examples

- Large hospitals
  - 3000-bed teaching hospital in India
- Medium size hospitals
  - 475-bed pediatric specialty hospital in Argentina
  - 355- & 241-bed municipal hospitals in Latvia
  - 325-bed private urban hospital in Lebanon
  - 200-bed urban hospital in the Philippines
  - 140- & 134-bed provincial hospitals in Argentina
  - 75-bed provincial hospital in the Philippines
  - 15 medium-size hospitals in Tamil Nadu
- Small health facilities
  - 50-bed district hospital in Senegal
- Central healthcare waste treatment plants
  - GJ Multiclave plant in Tamil Nadu, India



India



Latvia



Argentina



Senegal



Vietnam

# Hospitals BEFORE → Hospitals AFTER

- Minimal or no healthcare waste management (HCWM)
- Waste scattered around the facility
- Little or no segregation
- Inadequate containers
- Improper storage
- No treatment
- No HCWM training
- Many cases of nosocomial infections
- Many cases of needle-stick injuries and exposures to infectious waste



- Hospitals are now models of HCWM practices for their province, country or region
- Training centers for HCWM
- Recipients of awards and recognition from national and international bodies
- ISO 14001 certification
- Centers of Excellence
- Reduced nosocomial cases and reduced occupational injuries and exposures
- Subject of positive media coverage



# Aspects of the Development of the Hospital as a HCWM Model

- Healthcare Waste Management (HCWM) Procedures and Best Practices
- Environmentally Sound Treatment Technologies for Healthcare Waste
- Process of Transformation
- Sustainability

# HCWM Procedures and Best Practices

Waste Classification

Waste Segregation

Waste Minimization

Containers & Proper  
Placement

Colour Coding

Signs and Posters

Collection & Handling

Transport

Transport

Storage

Treatment

Disposal

Spill Clean-up

Post-Exposure

Prophylaxis

Documentation &

Recordkeeping

# Non-Incineration Treatment Technologies

## ❖ Autoclave technologies

- Small autoclaves – health posts, small remote clinics
- Medium- and large-size autoclaves - hospitals
- Very large autoclaves – central treatment facility



Tanzania



Senegal



Argentin



Senegal



India



Vietnam

# Non-Incineration Treatment Technologies

- ❖ **Advanced hybrid autoclave systems** – hospitals and central treatment facilities
  - Rotating autoclave
  - Hybrid autoclave with internal shredding
  - Hybrid autoclave with fragmenting arm
  
- ❖ **Microwave technologies** - hospitals
  
- ❖ **Alkaline hydrolysis** for anatomical waste - hospitals



Latvia



Lebanon



Latvia



Latvia



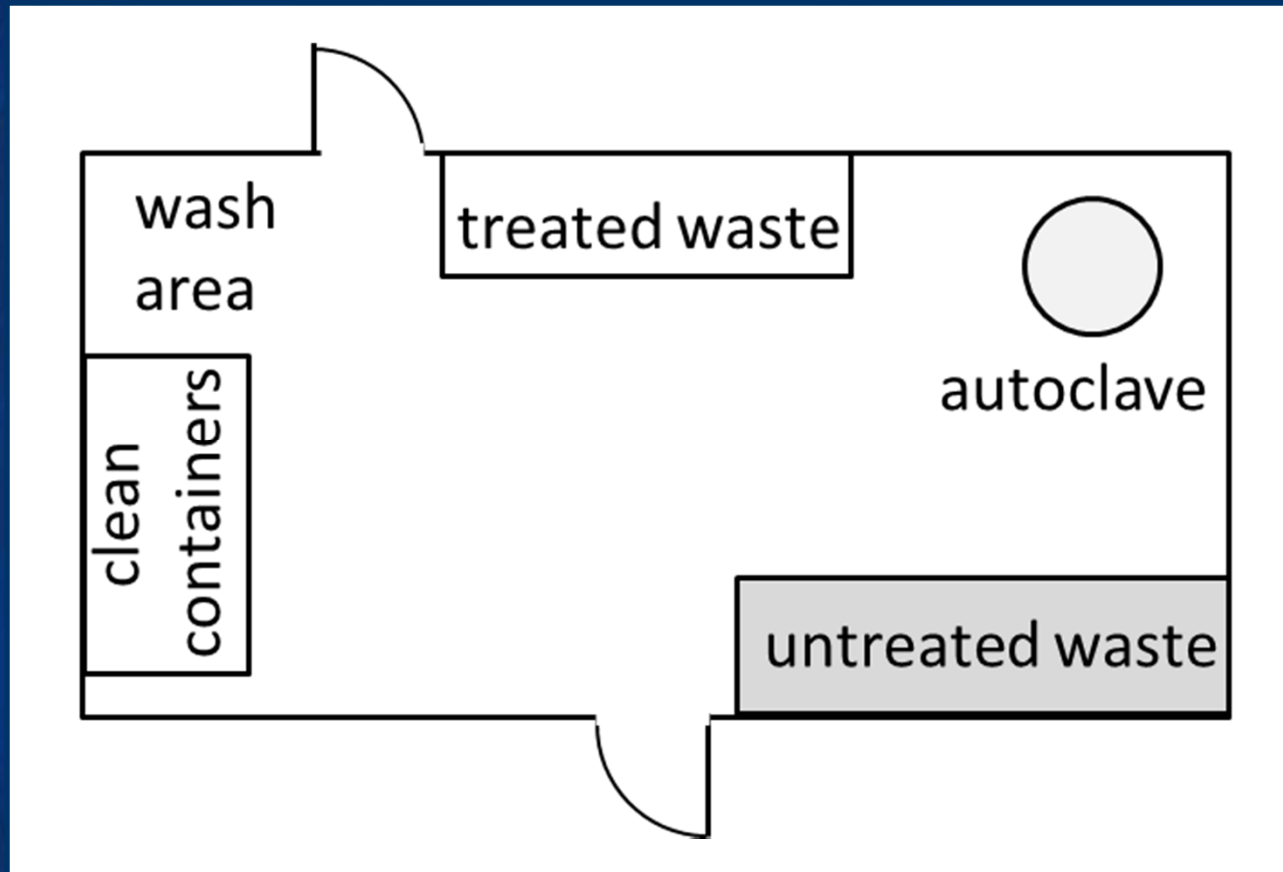
# Some Important Aspects Related to Treatment Technologies

- Selection
- Site Preparation and Layout
- Installation and Testing
- Program of Preventive Maintenance

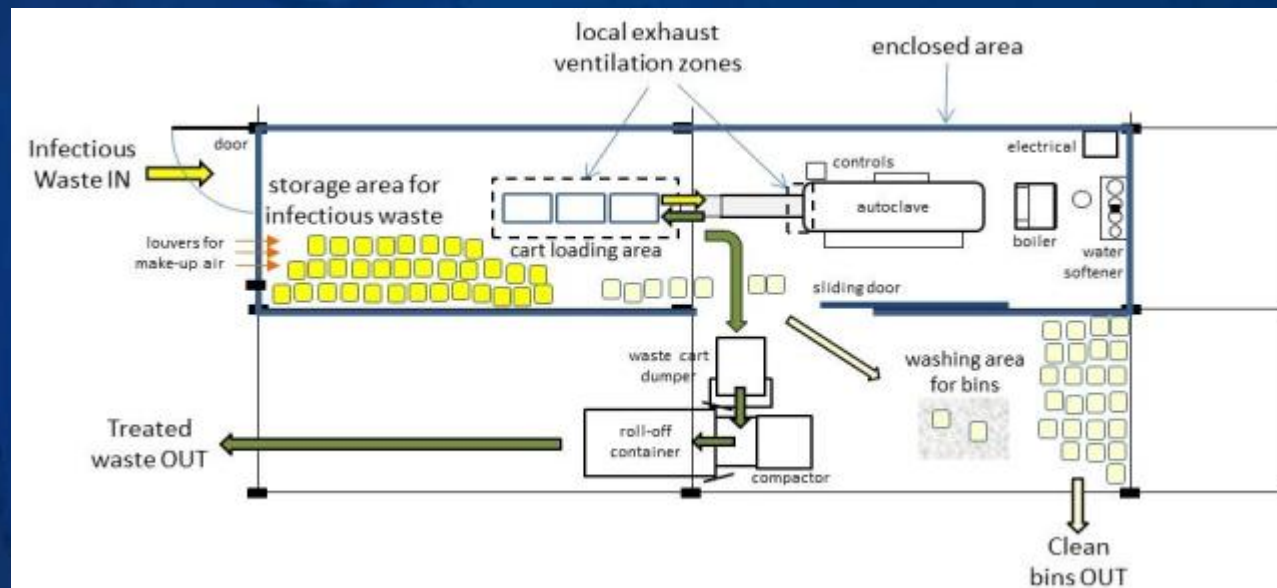
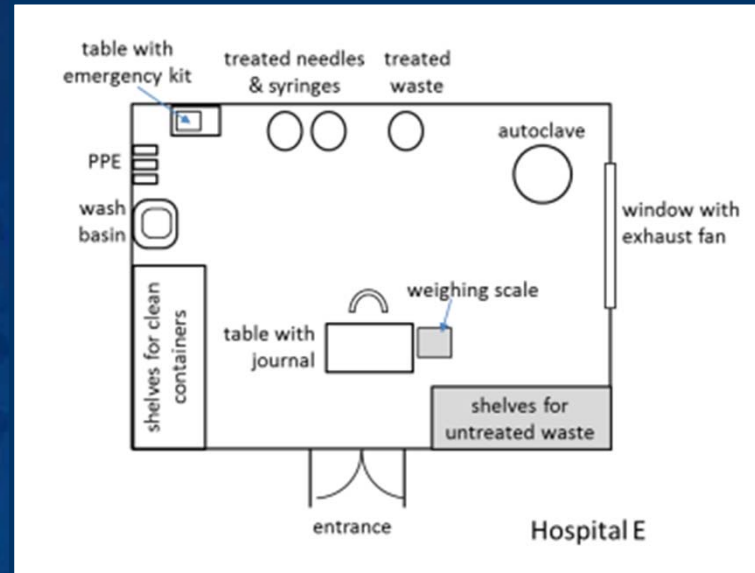
# Some Factors to Consider in Selecting Treatment Technologies

- Throughput or capacity
- Types of waste treated
- Microbial inactivation efficacy
- Environmental impact
- Space requirements
- Energy and utility requirements
- Ease of operation
- Safety features
- Reliability
- Track record
- Availability of technical support
- Availability and cost of spare parts
- Regulatory acceptance
- Acceptance by the staff and community
- Cost

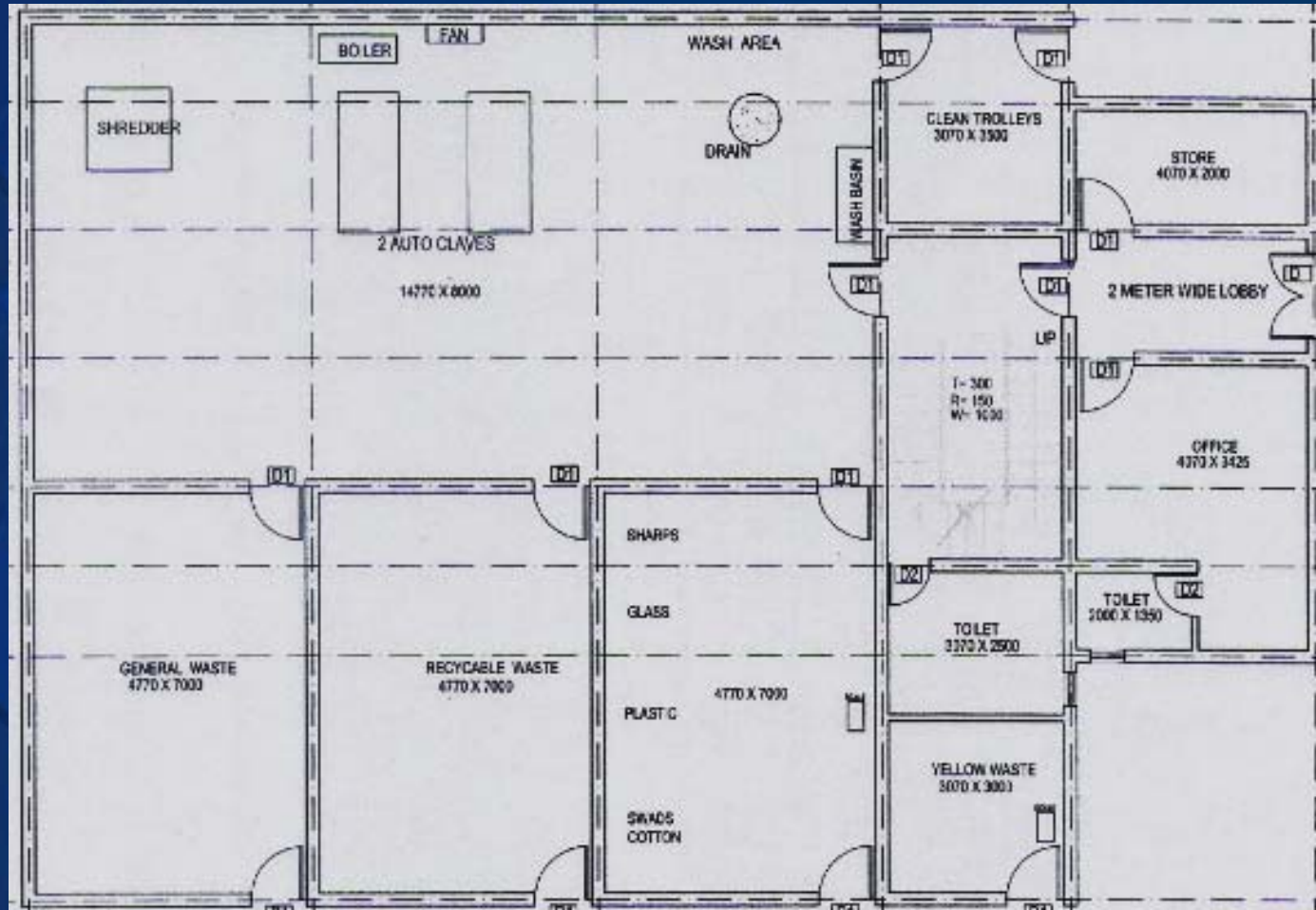
# Site Preparation and Layout



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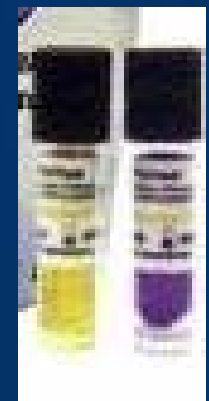
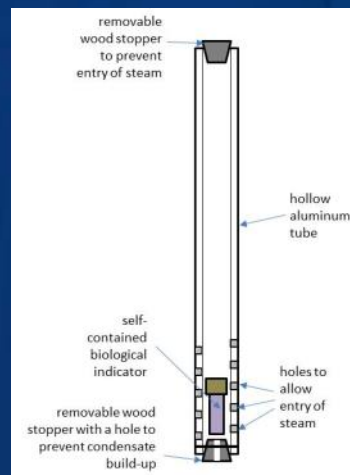
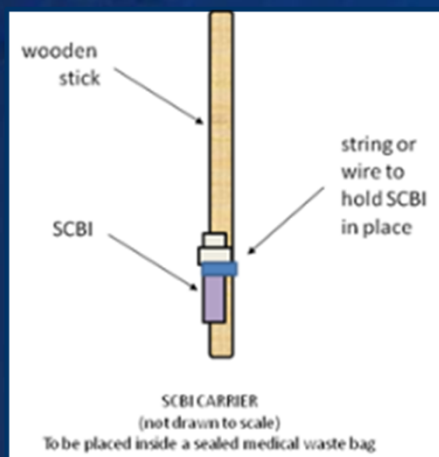


# Site Preparation and Layout



# Microbial Inactivation Testing

- Self-contained biological indicators (SCBIs) and a small incubator
- $\geq 10^4$  spores per vial of *Geobacillus stearothermophilus* or *Bacillus atrophaeus* in plastic vials
- SCBIs have glass ampoules containing the growth media and a color changing indicator



# Process

- Assessment
  - Occupational safety, patient health (nosocomial infections), community health and environmental impacts of the current situation
  - Waste assessment (how much is produced per day, by what department)
  - Baseline and analysis (UNDP GEF Project's Individualized Rapid Assessment Tool)
- Commitment by the Administration
  - Facility Policy
- Organization
  - Creation of a HCWM committee
  - Fostering of HCWM champions among staff

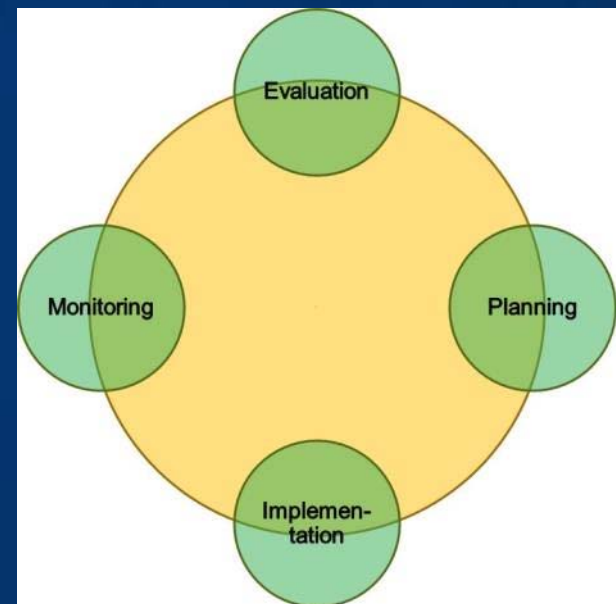
## Process (continued)

- Planning
  - Study of regulatory requirements, national and international standards, recommended best practices
  - Setting of goals and specific objectives, including measureable indicators of success and timeline (including milestones)
  - Prioritization (e.g., sharps, cultures)
  - Review and evaluation of options
  - Development of written HCWM procedures, recommended practices, contingency plans, etc.
  - Development of an implementation plan with stakeholder participation in reviewing the plan and providing input



## Process (continued)

- Assigning roles and responsibilities
- Implementation of the Plan
  - Awareness-raising and initial training in HCWM
  - Modeling of HCWM in selected departments (evaluation of lessons learned)
  - Expanding the HCWM system to the entire facility
- Monitoring and assessment
- Review and updating of the Plan
- Continuous improvement



## Factors that led to success

- ✓ High level of commitment by the administration
- ✓ Active Healthcare waste management committee in the hospital
- ✓ Environmental champions developed among the staff
- ✓ Healthcare waste management linked to infection control and patient safety
- ✓ Healthcare waste management plans developed with stakeholder participation
- ✓ Trainers developed in the facility
- ✓ Monitoring, evaluation and continuous improvement



Argentina

## Resources developed by the UNDP GEF Project: Examples

- **Guidances**
  - ✓ Conducting a baseline assessment
- **Tools**
  - ✓ Individualized Rapid Assessment Tool (I-RAT)
- **Technology Specifications**
  - ✓ Compilation of treatment technology vendors worldwide
  - ✓ Procurement specifications for autoclaves and other technologies
  - ✓ Procedure for microbiological testing of waste treatment autoclaves
  - ✓ Requirements for non-mercury thermometers and sphygmomanometers
- **Training Resources**
  - ✓ 25 comprehensive training modules, slides, handouts for students, instruction manual
  - ✓ Narrated PowerPoint, videos
- **Sample segregation posters, sample facility policies, etc.**



Content	
Section	Content
1. Introduction	Basic information and instructions on the use of the I-RAT
2. I-RAT	Individualized Rapid Assessment Tool for a single facility
3. Answer Guide	Guide to YES and NO responses to the I-RAT questions
4. Glossary	Glossary of terms and abbreviations

> To access any of the above sections, click on the table below.

## Resources of the UNDP GEF Project

- Guidances, tools, reports, summary and brochure on project outcomes and lessons learned, case studies, recommendations, etc. in English, French and Spanish (some documents in Arabic and Russian)
- Website to be re-designed and remain as depository of resources:

[www.gefmedwaste.org](http://www.gefmedwaste.org)

