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The Health Sector in Africa



National Healthcare Waste Capacity Building Strategy



Country: XXX
(DRAFT)

Date: 10.10.2016

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Abbreviations

GEF	Global Environment Facility
CPD	Continuing Professional Development
DeL	Distance-e-Learning
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HCW	Healthcare Waste
HCWH	Health Care Without Harm
HCWM	Healthcare Waste Management
HIV	Human Immunodeficiency Virus
HWC	Healthcare Waste Carrier
HWI	Healthcare Waste Inspector
HWM	Healthcare Waste Manager
HWO	Healthcare Waste Officer
HWT	Healthcare Waste Technician
IEC	Information, Education, Communication
MoH	Ministry of Health
MT	Master Trainer
SOP	Standard Operating Procedure
UNDP	United Nations Development Programme
WHO	World Health Organisation

Disclaimer: This project is funded by the Global Environment Facility (GEF) Trust Fund, which was established on the eve of the 1992 Rio Earth Summit, to help tackle our planet's most pressing environmental problems. It is implemented by the UNDP - United Nations Development Programme Istanbul Regional Hub (IRH) in partnership with WHO and the NGO Health Care Without Harm (HCWH). The views expressed in the document are those of the author and do not necessarily reflect the official opinion of the UNDP. Neither GEF, the UNDP nor any person acting on their behalf may be held responsible for the use which may be made of the information contained therein.

1 Introduction

Starting points for any new developments in the healthcare waste (HCW) sector in XXX will be the high awareness on to be solved problems among the stakeholders and directors of health facilities as well as the knowledge among the healthcare staff on how to solve the problem. In a healthcare facility at least one person (better two) should be fully trained on healthcare waste management (HCWM) tasks, should be able to implement a safe management system and should be able to undertake proper measures in case of incidents or crisis. Therefore, the aim of this strategy is to set up a sustainable national training system on safe management of HCW in the healthcare sector to increase the know-how in this subject in a professional and monitored manner.

The capacity building system shall be based on the:

- Law XXX
- Guideline xxx

An assessment of the healthcare waste situation in targeted healthcare facilities was carried out to identify the training needs. The assessment included interviews of stakeholders working in healthcare facilities and visits to healthcare facilities.

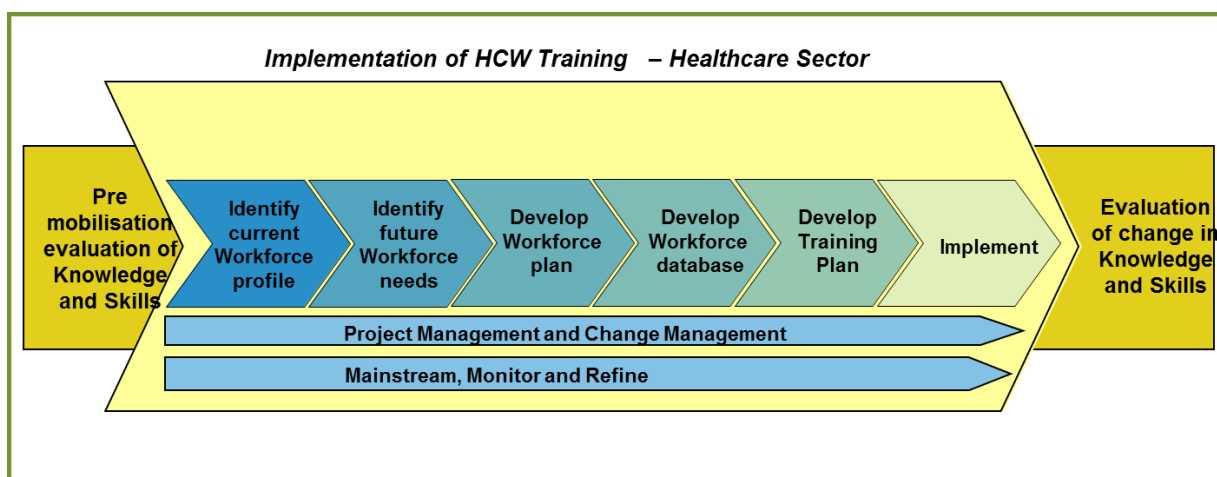


Figure 1: Development of the HCW training system for XXX

An extensive training system designed to cover the entire healthcare sector in XXX was developed to improve the situation. It is recommended that training issues should become an integral part of the management of healthcare facilities and that it should be in future a duty for the director of a healthcare facility to employ at least one - better two - fully trained and certified persons who are responsible for healthcare waste.

This duty will be included in the new guidelines on healthcare waste and the fulfilment of this should be supervised by the responsible authority to ensure enforcement and sustainability of an to be introduced HCW training system. It is further recommended to base the provision and prolonging of certificates on a continuous professional development (CPD) system.

To implement the system the following strategy is recommended:

1. Provision of the training as official recognized vocational training (with the possibility to award credit points). The training could be implemented in close cooperation with already existing, donor financed programs.
2. Including general issues on healthcare waste in the University curriculum for nurses and physician.

This training strategy does not cover more specialized aspects of capacity building. During the need assessment an additional need on capacity building in the following sectors got visible:

- E.g. Capacity building on the type-testing, validation, commissioning and testing of steam based treatment systems (autoclaves)
- E.g. Capacity building in the field of the management and transportation of hazardous good on public streets

2 Objectives of the HCW Capacity Building System

The overall objective will be to create a strategy and framework for an enduring training system on healthcare waste based on the internationally recommended “Healthcare Waste Officer (HWO)” & “Healthcare Waste Inspector (HWI)” principle. Another objective is to set up a strategy which takes into consideration the training needs of different types of healthcare facilities located in XXX.

The target of the capacity building system shall be to have trainees capable of planning, setting up and operating a sufficient management system in their respective healthcare facilities. This shall include the training of colleagues in HCW, the implementation of occupational exposure response system and the monitoring and supervision of all activities related to healthcare waste.

Another target is to strengthen the monitoring system for healthcare waste management by training responsible inspectors from the health as well as the environmental side in the monitoring of HCW management systems.



Figure 2: Sample of tasks of a healthcare waste officer

The need for capacity building does not only exist cause of regulations but also due to the to be inspected accreditation standards. Typical accreditation standards require that hospitals must plan for the safe managing of waste, must implement these plans, must train all relevant staff in their responsibilities regarding waste management, and must collect and analyse data to determine the effectiveness of the plans.

3 Key Stakeholders for HCW in XXX

In order to have a successful implementation of a HCW system, the following organisations shall be included in the training and capacity building system:

- ▶ Capacity building institutions
 - E.g. Medical University
 - E.g. Institute of Postgraduate Medical Education
 - E.g. School of Public Health
 - NGO, INGO, Donor?
 - Other capacity building institutions?
- ▶ Ministry of Health
- ▶ Ministry of Environment;
- ▶ Other stakeholders involved in the development and implementation of the National Healthcare Waste Management Strategy,
- ▶ Operators of treatment plants and disposal facilities

In order to develop a training system, a close cooperation of the Ministry of Health with the other organisations will be needed. The setup of a working group, especially for the development of the training curricula, is recommended.

4 Proposed HCW Training Strategy

4.1 Awareness Raising at Managerial Level

Successful HCW management systems depend on the full support from the management level. In order to raise awareness of healthcare waste problems and to secure the necessary financing, it is necessary to carry out strategy and awareness raising workshops for healthcare facility managers. When organising workshops, the service level of the respective healthcare facility shall be taken into consideration.

4.2 HCW Strategy – Organization & Responsibilities

An internationally proven and cost-effective method for implementing HCW management systems is the creation of the position of a person responsible for HCW who will be officially appointed by the director of a healthcare facility. The person responsible for HCW shall be personally and legally responsible for the implementation and operation of the new waste management system. The responsible person for HCW is the strategic head of the waste management in a healthcare facility. (S)he is responsible for the supervision of the introduced waste management system, for the introduction of new waste management methods and for the training of hospital staff (in-house training). Typically, the person responsible for HCW is an employee of the technical department, the housekeeping or has an infection control background. The main tasks of the person responsible for HCW can be summarised as follows:

1. Information and Motivation:

- Informing stakeholders, staff, patients and the public about waste management activities in hospitals
- Carrying out healthcare waste training and awareness program in institutions
- Sensitisation and motivation of hospital staff in healthcare waste matters
- ...

2. Initiative and Innovation:

- Stimulation of the new and better waste management and treatment methods
- make recommendations and give advice on purchasing of environmentally- friendly disposables and investment goods
- Introduction of environmental friendly procedures, replacement of disposables, mercury, collection of valuable waste, etc.
- ...

3. Monitoring and Supervision:

- Supervision of the internal waste logistics including segregation, collection, storage and disposal
- Supervision of the supply of waste collection materials
- Monitoring the environmental capacity building in the hospital
- ...

4. Reporting and Documentation:

- Reporting on accidents and incidents related to hospital waste
- Documenting waste activities in an institution, setting up of waste balance sheets and waste stream analysis
- Carrying out waste audits
- ...

5. Operational waste management:

- Organisation and management of daily waste services
- Responsibility for setting up and carrying out waste collection schemes
- Responsibility for safe treatment and disposal of collected healthcare waste
- ...

While for smaller facilities often one trained person in HCW can be sufficient and can do the described work as part-time tasks, it is recommended for secondary and tertiary healthcare facilities to delegate the tasks to at least two persons. While the first person is responsible for the operational healthcare waste management (task 4 and task 5) and is from the technical department or the housekeeping, the second person is typically responsible for monitoring and training (task 1 and task 3) and belongs normally to the nursing sector.

4.3 Adapted System for the XXX Healthcare Sector

Depending on the size and the service level, healthcare facilities generate a different range of HCW streams that need to be managed. While practitioners and health posts only generate small amounts of domestic waste and minimal amounts of hazardous waste (mainly sharps), primary level healthcare facilities generate more domestic waste and some amounts of hazardous waste (infectious waste, sharps, heavy metal waste and certain chemical waste streams). Secondary level hospitals generate significant amounts of domestic waste and hazardous waste (e.g. district level hospital) and tertiary level hospitals (e.g. regional treatment and diagnostic centres, specialized centres and university hospitals) generate between 50-75 different types of hazardous waste streams, including waste streams difficult to manage such as cytotoxic or radioactive waste.

The complexity of disposal logistic systems differs between the service levels of healthcare facilities just like for the waste spectrum. It is recommended to adjust the demands relating to the qualification of a person responsible for HCW to adapt to real needs. It is proposed to set up a training system which can serve three levels of healthcare facilities (primary, secondary and tertiary level). Depending on the level of the hospital, the training duration and content should be adjusted. In all healthcare facilities at least one person should receive a general environmental orientation training which should include also the general precaution standards on infection control. For the more specialized healthcare waste training the following system is suggested:

- For practitioners, dentists, other stakeholders:
 - One day environmental orientation training, concentrating on environmental health, waste management and infection control.

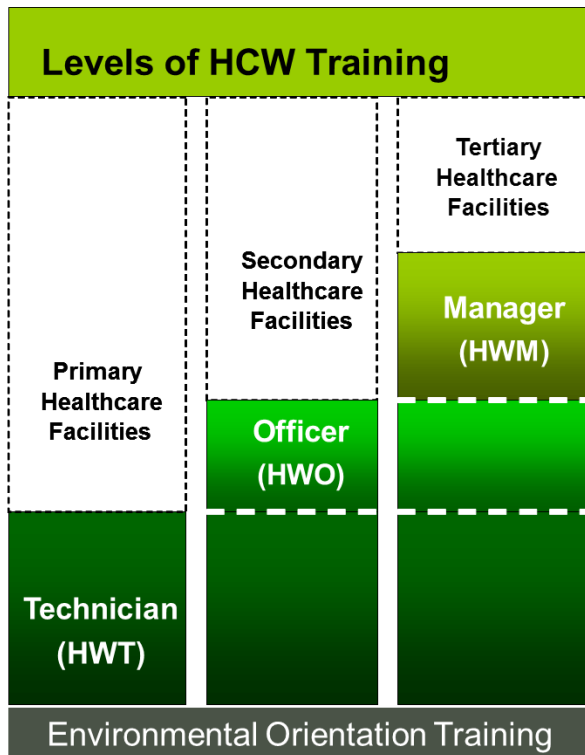
For larger healthcare facilities:

- Primary level healthcare facilities (1 person)
 - Education level: Basic know-how in HCW Management
 - Certification: Healthcare Waste Technician (HWT)

- o Duration of the training: 3 days

- Secondary level healthcare facilities (District Hospitals, 2 person)

- o Education level: General know-how in HCW Management



- o Certification: Healthcare Waste Officer

- o Duration of the training: 3 days (+3 day HWT training)

- Tertiary level healthcare facilities (National/Special hospital, 2 person)

- o Education level: Advanced know-how in HCW Management

- o Certification: Healthcare Waste Manager (HWM)

- o Duration of the training: 3 days (+3 day HWT + 3 day HWO)

In order to force healthcare facilities to send their employees to training sessions to obtain qualification, healthcare institutions should have a clear duty to employ at least one qualified and registered person to be responsible for HCW. This duty shall be prescribed all new guidelines and policies on HCW.

Figure 3: Level based training system

4.4 Functions to be trained

It is recommended to set up a training system which will allow the training for the following positions:

1. Master Trainer (MT)

The MT should hold a bachelor or master's degree in public health, environment, hygiene or comparable. (S)he shall be responsible for training of trainers (healthcare waste officers / managers) in cooperation with HCW experts and for training of trainers-to-be (Healthcare waste technicians) from primary healthcare facilities. The MT shall also be able to provide HWI training for the Inspectorate and HWC training based on the UN requirements for the transport of hazardous goods on streets.

2. Healthcare Waste Technician, Officer, Manager (HWT/O/M)

The HWT/O/M will be an employee from the waste generator side (primary, secondary, tertiary healthcare facilities). HWT/O/M will be responsible for waste management in their facilities. It is recommended that participants will receive on credit point for each reached education level. For Infection Control Practitioners this shall be part of the regular curriculum.

3. Healthcare Waste Inspectors (HWI)

The HWI will be an employee from the state or province inspection agency who has to monitor healthcare facilities in XXX. They will follow a general HCW training and will be trained in how to monitor healthcare waste facilities.

4. Healthcare waste carriers (HWC)

Healthcare facilities or companies which have the task to collect and transport hazardous healthcare waste shall employ at least 2 drivers who are trained in the transport of hazardous goods on public streets.

5. Treatment Plant Operator (TPO)

The treatment of healthcare waste should only be done by trained operators. The operators should participate at least in a one day training, covering aspects on how treatment plants are functioning, how to maintain treatment plants, how to monitor treatment plants and on all aspects of occupational health and safety.

The different tasks of the trained staff within the general capacity building and training system in HCW in XXX is displayed further in the text. Of special importance will be the training of other staff in the own facility to fulfil the accreditation requirements.

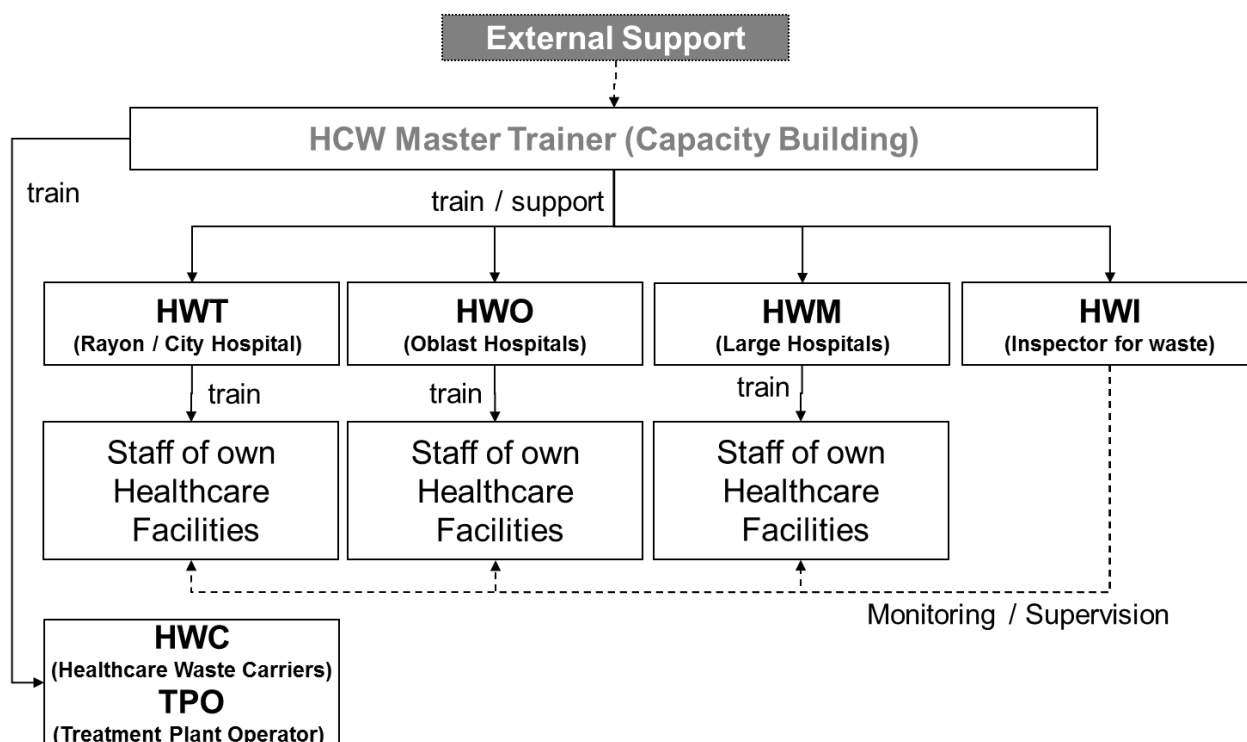


Figure 4: Schematic of the provision of training

4.5 Providing HCW Training

The target group of to be trained staff will be employees of the middle management level in a healthcare institution, typically the head of housekeeping, the head nurse or a manager from the technical department. In smaller facilities a registered nurse might take over the task. During training sessions, the participants shall learn how to set up and independently run a healthcare waste management system of their own health institution or how to supervise and support other organisation.

The proposed training of the HWO/HWT/HWM as well as the HWI training should be:

- based on an up-to-date information (new XXX regulations, international recommendations and latest information about HCW),

- oriented towards the needs of the participants,
- interactive,
- praxis orientated and
- should include workshops and role play.

All types of training should start with a basic training in waste types, risk prevention, classification, labelling, etc. During training sessions it is necessary to visit at least once a healthcare facility (to carry out a snap shot analysis) to provide the participants with an opportunity to practise and disseminate the know-how they obtained. After a year, latest after two, a follow-up & refresher training should be carried out.

5 Sustainability, Quality Control, Continuing Professional Development (CPD) and distance learning

5.1 Sustainability Aspects

Sustainability of the system shall be ensured by:

1. Involvement of local training provider

It is recommended to include, if possible from the very start of the training sessions, a local training provider (e.g. Institute of Postgraduate Medical Education) who shall be responsible for continuing the developed trainings. All training materials which have been developed shall be handed over to this training provider.

2. List of training requirements:

a. A waste generator is obliged to employ skilled staff:

The duty of waste generators to employ skilled and certified staff or to train their own staff shall be included in the national guidelines. Additionally, the Job description for these staff shall be included.

b. Certified staff is obliged to update know-how

The duty for the certified staff to regular participate in training courses shall be included in the national guidelines.

During the regular monitoring of healthcare facilities the task of the State or Local Inspectorate shall be to check whether the healthcare facilities employ the required HWT/O/M trained and certified in accordance with the level of healthcare facilities.

5.2 Quality Control and CPD

After attending the training sessions, each HWT, HWO or HWM trainee should sit for a test. After they have successfully passed this test, the trainees will be provided with a certificate to indicate the level of the knowledge. Additionally, the name and details of the successful applicants shall be registered with the Ministry of Health. The records shall be kept for a period of at least four years.

Individuals registering as HWT/O/M, must continue to learn and develop their experience throughout their professional careers. This is necessary to keep up-to-date with legislative requirements and best practice. A person registered will have to participate in a refreshment course (1 – 2 days) at least every two years. After attending this course, the enrolment in the register shall be automatically prolonged for two years. Register keeping shall be e.g. a task of the Ministry of Health.

5.3 Distance Learning

Distance learning is a mode of delivering education and instruction to students who cannot physically present in a traditional setting such as a classroom which will be of special importance for healthcare workers from more rural facilities or smaller facilities who out of logistical reasons or due to the need to be physically present in their facilities will have difficulties to participate in trainings. It is of special importance for CPD as a refreshment and

upgrade of the healthcare waste knowledge can be reached with comparable low financial efforts. Especially the possibilities on distance e-Learning (DeL) - a combination of Distance Education and e-Learning, should be researched.

6 Training Matrix

Training Module	HEALTHCARE WASTE TECHNICIAN	HEALTHCARE WASTE OFFICER – OPERATIONS	“ HEALTHCARE WASTE OFFICER – MONITORING	HEALTHCARE WASTE MANAGER	HCW TREATMENT PLANT OPERATOR	HEALTHCARE WASTE CARRIER
General environmental and waste information	1	1	1	1		
Definition, classification, waste streams and generation	1	1	1	1		
Risks of healthcare waste for human beings	1	1	1	1	1	1
Waste segregation - The key for waste management	1	1	1	1		
Responsibilities and organization - The Hospital Waste Executive	1	1	1	1		
International and national regulations, guidelines, policies	1	1	1	1		1
Transport and storage of healthcare waste I (incl. workshop)	2	2	2	2		
Sharps: Handling and mitigation measure (incl. workshop needle-stick)	2	2	2	2		
On-Site treatment of infectious waste		1	1	1	1	
Working Safety- Prevention of occupational injuries	1	1	1	1	1	1
General chemical waste management	1	1	1	1		
Management of chemical laboratory waste		1	1	1		
Management of photochemical waste (incl. workshop)		2	2	2		
Training of trainer (incl. workshop)		2	2	2		
Pharmaceutical waste management		1	1	1		
Recycling, reduction and eco efficiency (incl. workshop)		2	2	2		
Snap shot analysis (incl. execution in a local facility)		1	1	1		
Waste audit (incl. follow up workshop)		2	2	2		
Waste management plan – plans, policies and action plans (incl. workshop)		2	2	2		
Implementation of healthcare waste management plans		1	1	1		

Cleaner healthcare service

1

6.1 Detailed training modules contents

6.1.1 General environmental and waste information

- **Training objectives:**

This module includes general information about waste and the role of natural cycles to ensure the trainees possess a homogeneous knowledge base and are able to understand the general terms and objectives of waste management. Thus this module is the initial point of all further training activities in the field of healthcare waste management.

- **Covered topics:**

Natural circles: the basic principle of natural circles, hazardous substances in water and air, health hazards and their sources

Waste: definition of terms, waste streams in the daily environment and in hospitals in particular, definition of hazardous substances and hazardous waste, basic objectives of waste management, pollution prevention hierarchy

- **Performance criteria:**

After completion, the participants must understand the principle of natural circles and the associated coherences. They must be able to put the terms of waste and waste management in perspective, to relate the objectives of waste management and to demonstrate a clear knowledge of pollution prevention hierarchy (avoidance, minimization, treatment, and disposal).

6.1.2 Definition, classification, waste streams and generation

- **Training objectives:**

The module “Definition, classification, waste streams and generation” enables the participants to deal with general definitions of healthcare waste and provides a basis for proper waste management activities, especially the need for segregation. To make the trainees responsive to the topic of healthcare waste management, the module includes also facts about the problematic in other countries.

- **Covered topics:**

Healthcare waste: general definition, coherences of material input and waste output in different units, definitions of different types of healthcare waste, explanation of the different kind of waste streams (municipal, infectious waste etc.), major and minor waste sources, composition and amount (international figures), calculation of generation rates

- **Performance criteria:**

The participants must have internalized the coherences of material input and waste output. After module completion, they must be able to distinguish general from hazardous waste and the different waste types, to calculate the total waste stream and the amount of infectious waste in their facilities. In this context, they must have realized the factors affecting the waste amount.

6.1.3 *Risks of healthcare waste for human beings*

- **Training objectives:**

The knowledge of potential risks and hazards is essential to ensure safety management procedures and to prevent health threats and environmental impacts. This module educates the participants about the potential risks inside an outside of their sphere of action and about the principle of disease transmission cycle. The trainees will know the risks caused by improper healthcare waste management. In addition, the participants will be informed about the basic hygienic measures to break the infectious chain. To demonstrate the scope of this problematic, the module includes international facts.

- **Covered topics:**

Physical risks, chemical risks, microbiological risks, radiological risks; persons at risk inside and outside of a healthcare facility; hazards from healthcare waste; points of nosocomial problems inside hospitals, disease transmission cycle; the infectious chain: airborne, vehicle transmission and direct contact; hand-washing technique; international facts

- **Performance criteria:**

After completion; trainees must be able to reflect the different kinds of potential risks and hazards associated with healthcare waste handling, the risks for all persons involved in waste management (formal and informal), the principle of nosocomial infections linked to healthcare waste, the different kinds of diseases that can be transferred and the kinds of transmission ways. In this context, they must be able to identify their own responsibility in their sphere of action.

6.1.4 Waste segregation - The key for waste management

- **Training objectives:**

The different waste streams need different kind of packaging, handling, storage and transportation. Without effective segregation system the complete waste stream must be considered as hazardous. To ensure the trainee understands the need for effective waste segregation and they are able to implement this key of waste management, this module includes the principles for segregation and the associated measures such as colour coding, labelling, packaging and collection supported by practical samples. The content will be adapted, if national regulations concerning waste segregation exist. The conveyed knowledge is checked by means of a “Waste Quiz”.

- **Covered topics:**

Need for segregation, main principles, colour coding and packaging, labelling and waste collection, strategy of collection and segregation; planning of segregation points (incl. samples), material input and waste output analysis and colour coding for different units

- **Performance criteria:**

The participants must have internalized the need for effective waste segregation and their own role to achieve this management instrument. They must be able to segregate their waste according its properties, to implement a segregation system in their facilities, to plan segregation points and to develop basic information materials relating waste segregation.

6.1.5 Responsibilities and organization - The Hospital Waste Executive

- **Training objectives:**

The establishing of Healthcare Waste Executive is a proven and cost effective method for implementing healthcare waste management systems. One important task of the HWE is the training of colleagues. The training participants will be educated in establishing, duties, tasks and working areas of a Healthcare Waste Executive. In addition, they will be informed about need and structure of training measures executed by HWE and how they become a HWE.

- **Covered topics:**

Role, duties, tasks and working areas of a Healthcare Waste Executive; steps of waste management system implementation; waste audit; training and lecturing by the HWE; training concept to become a HWE

- **Performance criteria:**

The participants must understand the amenity of an efficient waste management system and they must demonstrate clear knowledge of the working areas, tasks and duties of Healthcare Waste Executives. After module completion, the trainees must be able to implement and analyse a healthcare waste management system in their facilities.

6.1.6 International and national regulations, guidelines, policies

- **Training objectives:**

National regulations and guidelines concerning public health or safe management of hazardous waste should agree with international regulations. The trainees will be informed about international and multilateral regulations for healthcare waste and about the contents of guideline published by the WHO. This module enables the participants to develop own regulations and guides in their facilities based on basic principles of waste management and the recommendations of international organizations and authorities. In case of national regulations concerning waste and healthcare waste management are available, this module will respond these.

- **Covered topics:**

International principles for handling waste; international regulations; the guideline of WHO; waste definitions and categories in different regulations and recommendations; the contents and key objectives of the Basel Convention; the UN-Recommendations on Transport of Dangerous Goods; the European Waste Catalogue; national regulations (if available)

- **Performance criteria:**

The trainees must understand the necessity and purposes of national regulations and they must be able to develop their own regulations considering basic principles of waste management, international regulations and the WHO recommendations, if these are not available. They must understand the main principles of waste management, the main international waste regulations and their objectives. The participants must also demonstrate a clear knowledge of the definitions and waste categories included in international or national regulations and guides.

6.1.7 Transport and storage of healthcare waste I (incl. workshop)

- **Training objectives:**

The non-hazardous waste logistic includes the collection, transportation, interim storage, and set ready for disposal of all kind of non-hazardous waste. To ensure the trainees are able to implement internal non-hazardous waste management procedures, this module includes information about basic principles and practical instructions for internal waste collection and transport. The training participants will be directly involved by means of a workshop including tasks to concept segregation points and internal waste logistic strategies

- **Covered topics:**

Non hazardous waste: collection, short interim storage, internal transport of non hazardous waste incl. route planning and transportation means, central and de-central collection points

- **Performance criteria:**

After module completion; trainees must be able to show that in each work area they understand their own role and that of other personnel involved and must demonstrate a clear knowledge of internal waste transportation and storage principles. They must be able to implement these and to develop internal logistic strategies in their facilities.

6.1.8 *Sharps: Handling and mitigation measure (incl. workshop needle-stick)*

- **Training objectives:**

Sharp injuries are one of the most important problems in a healthcare facility. It is well known that giving injections using non-sterile procedures can cause abscesses and transmit life-threatening infectious diseases, including hepatitis B, hepatitis C and HIV. To build awareness and capacity in safe sharps handling, this module includes facts about needle stick injuries and persons at risk and brief the participants on mitigation measures. The quantity of injuries caused by needle sticks and other sharp items will be reduced by provision of practical instructions for correct use of sharp disposal containers and mechanical breaking devices.

The training participants will exercise the learned knowledge by means of a role-play. The workshop will enable the participants how they must act in cases of needle stick injuries - the person injured and the executives.

- **Covered topics:**

Facts about sharps and needle stick injuries; sharps and nosocomial infections; persons at risk; injection control by performance and equipment: avoidance of recapping, awareness building/training, hepatitis B vaccination requirements, safer medical design of sharps, needle avoiding system; disposal methods: correct use of sharp disposal containers and mechanical breaking devices; sharp improvement program

- **Performance criteria:**

The training participants must understand the general problematic of sharps handling and must possess clear knowledge of the application of safe disposal methods. They must know how they avoid needle stick injuries, how they act in cases of injuries and how they prepare an accident report. The trainees must be able to implement a sharp improvement program in their facilities.

6.1.9 *On-Site treatment of infectious waste*

- **Training objectives:**

The treatment of infectious waste should not threaten the environment and public health and must be safe for personnel. On-site treatment is often the only opportunity in developing countries where healthcare facilities are far away from each other and the road network is bad. Hence, this module will build awareness and capacity in safe on-site treatment methods including definition of relevant terms.

It enables the trainees to select a safe treatment technology considering specific requirements on waste treatment, operation and maintenance criteria, and potential environmental impacts. To reduce the environmental impacts caused by waste incineration, the training participants will get knowledge of the types of flue gas cleaning and safe ash disposal.

- **Covered topics:**

Advantages of on-site treatment; definition of terms: disinfection versus sterilization; disadvantages of chemical treatment; treatment with steam: fundamentals, types and operation of treatment plants, process cycles according treatment types; Incineration: fundamentals, operation of incinerators, operation problems, the problem of dioxins, flue gas treatment systems: dry and wet systems, maintenance of incinerators, set up of ash pit

- **Performance criteria:**

The trainees must be able to show that they understand the need for safe and environmental friendly infectious waste treatment methods and must demonstrate clear knowledge of the specific requirements on infectious waste treatment, the main types of steam treatment plants and associated process cycles, the principles of incineration and the opportunities to avoid environmental threats.

6.1.10 Working Safety- Prevention of occupational injuries

- **Training objectives:**

The positive impact of introducing occupational safety and health (OSH) management systems at the organization level, both on the reduction of hazards and risks and on productivity, is recognized by governments, employers and workers. To enable the training participants to implement safety management structures with the aim to reduce the cases of occupational injuries in their facilities, the module “Working Safety- Prevention of occupational injuries” provides fundamental information about occupational risks and implementation instructions. The included protective measures will directly improve the occupational safety situation in healthcare facilities.

- **Covered topics:**

Accidents and risks; planning and implementation of safety management procedures; identification of risks; exposure control plan; protective measures: fire emergency, gas safety, personal protective equipment, universal precautions for handling of infectious waste, personal hygiene, housekeeping and immunisation.

- **Performance criteria:**

The trainees must be able to implement safety management procedures in their facilities. To achieve this objective, they must be able to identify hazards and must demonstrate a precise knowledge of the planning and implementation phases, the opportunities to avoid exposure and the performance in case of emergencies.

6.1.11 General chemical waste management

- **Training objectives:**

Chemicals are increasingly used in healthcare facilities, not only in major hospitals but also in small and medium size facilities. Some of these chemicals are hazardous and require special handling, packaging and labelling procedures. To realize safe management of hazardous chemicals, this module defines the properties of hazardous substances and enlightens the participants in packaging, labelling and potential for hazardous chemicals used in most of the

facilities. The consideration of recycling methods for different chemicals will lead to decrease in quantities supplied and disposed of.

- **Covered topics:**

Properties of chemical hazardous substances; International Chemical Safety Cards (ICSC): content, risk and safety phrases, sample; chemical waste kinds generated in healthcare facilities; chemical waste storage areas; hazards from, sources, packaging, labelling and recycling of: mercury, batteries, oil, photo-chemicals, PCBs, paint, VOCs and pesticides.

- **Performance criteria:**

The training participants must be able to define hazardous chemicals depending on their properties. They must know the main waste sources, how they handle, package and label the substances. In addition, they must demonstrate the knowledge of safe treatment and recycling methods. Using the knowledge imparted, the trainees must be able to develop handling instructions for different chemical waste kinds generated in healthcare facilities of every level.

6.1.12 Management of chemical laboratory waste

- **Training objectives:**

Several chemicals are solely used in research and medical laboratories. Only small amounts of chemical waste is generated irregularly - but managing the generation and disposal of these substances is one of the most difficult environmental management challenges for staff in laboratories. To implement safe management of hazardous chemicals in laboratories, this module provides information about the different kinds of chemical waste generated in laboratories and the associated hazards, and enlightens the participants in packaging and treatment procedures. The briefing about possible substitutions will lead to decrease in highly toxic waste quantities.

- **Covered topics:**

Kinds of chemical waste generated; hazards, storage, decontamination of spills, treatment and packaging: halogenated solvents, non-halogenated solvents, colorants; acids; bases; analytic apparatus in laboratories; applicable container materials for different substances; incompatible chemical waste mixtures; possible substitutions to decrease the toxic level; general safety practices and spillage procedures.

- **Performance criteria:**

After module completion, the trainees must be able to identify hazardous chemicals in laboratories. They must know the main waste sources, how they handle and package the substances and how they must act in case of spillages. In addition, they must demonstrate clear knowledge of safe treatment methods and substitution opportunities for core chemicals used in laboratories.

6.1.13 Management of photochemical waste (incl. workshop)

- **Training objectives:**

Photochemical waste is only generated in small quantities, but causes significant problems at disposal. After use the fluid chemicals cannot be dumped down the drain or left at a landfill because of the hazardous level. The participants will be trained in disposal and treatment methods considering minimum programs to avoid environmental and health impacts caused by inappropriate disposal procedures. By conveyance of background information it is ensured that all participants understand the main objectives and are aware of the problematic. The information about minimization, reuse and recovery potentials lead to decrease in waste quantities.

The training participants will exercise the learned knowledge within a following workshop. This provides the opportunity to test knowledge of participants in practical way.

- **Covered topics:**

Background information about the photochemical process; characterisation of process components: fixing and developing baths, rinse water; facts about X-ray films; transport, labelling and storage; environmental impacts; internal handling; personal proactive equipment; spill response procedure; process flow; pollution prevention; minimization, reuse and recovery potentials; measuring silver concentrations; disposal and treatment: septic tank, indirect discharge, minimum program, and central treatment; use of photochemical solutions in flue gas treatment systems

- **Performance criteria:**

The training participants must demonstrate knowledge of the different process components and the associated environmental impacts. They must show that they are able to implement safe photochemical handling, treatment and disposal procedures and that they understand the need, potentials and methods of minimization, reuse and recovery measures.

6.1.14 Training of trainer (incl. workshop)

- **Training objectives:**

The overall aim of training is to develop awareness of health, safety and environmental issues relating to healthcare waste. The training concept should be built up sustainable – that means, that the training modules are trained by appointed personnel. Hence the internal trainers have to be trained to transmit as well knowledge as methods and tools for effective and thorough designed lectures.

The corresponding workshop put the trainees in position to apply and reflect the content learned in practice. The participants can test their own knowledge of the topics conveyed in the associated training. In addition, it conduces to assess the state of knowledge through play. The role play “Discussion with the management” reconstructs a common situation. By stepwise execution of training exercises the prospective trainers can collect practical experiences. The consideration of time to discuss allows the direct involvement of all participants and to get a feedback from the others.

- **Covered topics:**

Module: reasons for training and lecturing, tools and methodology, trainer skills & experience recommendations, presentation techniques, training and learning resource materials, target

groups, planning and set up of training courses, assignment of training modules, awareness building, monitoring and controlling.

Workshop: necessary preparations before training start: preparing of a concept, discussion with the management, development of training material; training exercises: reading, presentation within a working group, presentation facing all participants

- **Performance criteria:**

After completion, the trainees must be able to spread their knowledge, to develop applicable training concepts using suitable training and learning resource materials. The prospective trainers must possess a clear knowledge of planning and set up of training courses. They must also know the main tools to monitor and control their training measures.

6.1.15 Pharmaceutical waste management

- **Training objectives:**

In general, most pharmaceutical waste is not hazardous and does not represent a serious threat to the public health or the environment. However, pharmaceutical waste may contain hazardous substances like non-biodegradable antibiotics, antineoplastics, disinfectants, etc. which are harmful for the environment or the public health. To prevent hazards and risks inside and outside of healthcare facilities, this module provides information about the types and main sources of hazardous pharmaceuticals and includes instructions for safe management and disposal.

- **Covered topics:**

Pharmaceutical waste: term definition; samples; places of generation; delimitation of hazardous and non-hazardous waste; controlled drug waste; segregation, management and internal logistic; precautions for handling hazardous pharmaceutical waste; sorting; external transportation; returning to supplier; disposal

- **Performance criteria:**

The training participants must know the main waste sources, how they handle, sort, package and transport the pharmaceuticals. They must be able to define hazardous pharmaceuticals depending on their properties. In addition, they must demonstrate the knowledge of precautions for handling hazardous pharmaceutical waste.

6.1.16 Recycling, reduction and eco efficiency (incl. workshop)

- **Training objectives:**

Reducing waste through waste minimisation and recycling can contribute to increased profitability and competitiveness while at the same time benefiting the environment. Due to the high demands on hygiene in healthcare facilities the reuse and recovery potentials are limited and the procedures require special attention. The trainees will be informed about strategies leading to waste quantity reduction, environment benefits and cost savings to build awareness in this specific area of waste management. To achieve safe reuse methods, the module includes general instructions and practical samples of realisation. The consideration

of “Eco efficiency” as approved instrument leads to heightened awareness and to observe the problematic in its entirety.

The planning of segregation points is one of the important efforts to implement the collection of recyclables. The workshop “Recycling” will set participants the task planning of segregation points in different kinds of wards. Thus, is it possible to check the state of knowledge through play and the participants can apply and test their knowledge of the topics conveyed in the training module before. In addition, it is a mean to support the discussion and exchange of experiences among themselves and to reveal specific questions and problems.

- **Covered topics:**

Module: strategies and general definitions; reasons for waste minimisation; Reduce: avoidance of waste, inventory management; Reuse: definition and samples, advantages, reusable alternatives, reuse of hazardous waste; Recycling: definition, general and environment benefits, recyclable materials, collection, organisation of recycling, value of recycled materials; Recovery; Eco efficiency: pollution prevention, eco design methods, green chemistry

Workshop: Planning of segregation points: standard ward, operation theatre, maternity ward

- **Performance criteria:**

After module completion, the trainees must have skills in reduction, reuse and recycling of waste. They must show that they understand and are able to implement the strategies and benefits of waste quantity reduction and must be aware of eco efficiency. In addition, they must have the ability to identify waste reduction potentials in their facilities.

6.1.17 Snap shot analysis (incl. execution in a local facility)

- **Training objectives:**

Snap shot analyses are conducted to get information out of the “first hand”, to ascertain the current situation in waste management, to gather quick the basics data for the planning of a follow up Waste Audit, to collect quick information for a rough waste plan, to present the momentary situation against third parties and to identify and document weak points. In addition to the reasons and tasks of snap shot analyses, the training participants will be informed about planning and preparation procedures and get practical support by questionnaire templates to be able to execute a snap shot analysis in their facilities.

The training participants will exercise the learned knowledge by means of following execution of snap shot analysis in a located healthcare facility. This provides the opportunity to test knowledge of participants in practical way, to collect experiences and to determine the current situation in waste management. The results and weak points will be evaluated and discussed within the trainee group to reflect the snap shot analysis.

- **Covered topics:**

Module: Reasons and tasks, planning and preparation, needed information, main points of monitoring, important areas of the hospitals, data collection, selection of interview partners;

Execution: presentation and discussions of the results of the snap shot analysis, discussion of the experiences and results, evaluation of the weak points

- **Performance criteria:**

After completion of module and workshop, the trainees must be familiar with the planning, preparation and execution of snap shot analysis. In this context, they must show their understanding of reasons and advantages of snap shot analysis and must be able to determine all steps included, to develop supportive materials and to evaluate the data collected.

6.1.18 Waste audit (incl. follow up workshop)

- **Training objectives:**

A waste audit is a formal, structured process used to quantify the amount and types of waste being generated in a healthcare facility. This instrument helps to identify current waste practices and how they can be improved to achieve a more efficient and effective organisation, cost savings and better use of limited natural resources. The trainees become acquainted with the reasons and main procedures of waste audit to conduct it in their facilities. To ensure the proper implementation, the module deals with all necessary steps to carry out waste audit and provides supportive information such as rough calculation of the total and infectious waste quantity.

The included workshop facilitates the exchange and discussion of negative and positive experiences. The training participants will apply the knowledge educated in the module to analyse existing weak points in their facilities.

- **Covered topics:**

Module: reasons for waste audit, planning and preparation; Steps to carry out waste audit: data and information collection, waste stream analysis, documentation of waste generation; Development of action plans: the necessary facts, rough calculation of the total waste, planning of waste generation

Workshop: experience discussion; weak point analyses: weak point cards, scoring method

- **Performance criteria:**

The training participants must show that they understand the advantages of waste audit and must demonstrate knowledge of all implementation steps, necessary data and documentation tools. In addition, they must be familiar with the main tools to calculate waste generation in their facilities.

6.1.19 Waste management plan – plans, policies and action plans (incl. workshop)

- **Training objectives:**

Waste management system requires a successive implementation as it will influence the organization of the hospital, will change work proceedings, responsibilities and duties are created, the necessary information flow must be cleared and the staff has to be informed and maybe trained. For this, it requires a detailed planning of each to be carried out step. Therefore, the trainees will be informed about the contents, chronology and set up methods of all necessary steps leading to waste management system.

After the presentation, the training participants will discuss practical matters and will develop first steps to implement a waste management system in their facilities.

- **Covered topics:**

Module: reasons for healthcare waste management, set up of a waste management plan: paths of decision making, waste audit, responsibilities in waste management, set up of waste policies, waste master plan, development of an action plan, implementation

Workshop: set up of a waste policy, development of a waste plan, planning of waste action programs, set up of a waste management action plan.

- **Performance criteria:**

After module completion; training participants must be aware of the need of waste management plans. They must demonstrate that they know the contents, objectives and proper chronology of all necessary steps leading to waste management system. In addition, they must know the basic set up methods.

6.1.20 Implementation of healthcare waste management plans

- **Training objectives:**

After gathering the baseline data by a waste audit, setting up a waste policy and develop a strategic waste master plan, concrete actions have to be identified, which have to be implemented in accordance to improve the safety, health conditions and financial and personnel resources. For these reasons, this module is focused on the last steps of waste management implementation and includes necessary aspects to achieve waste management improvements. The information about financial aspects referring to waste management support the participants to give a striking reason for implementation of healthcare waste management plans.

- **Covered topics:**

Action plan: development of the yearly waste action plan, definition of weak points, feasibility, priorities, time schedule; Implementation: conversion of organization structure, introduction of a system, action teams, stepwise implementation of action points, controlling of implementation, information structure and responsibilities; Financial aspects: cost and benefit analyses, return of investment, cost-benefit ratio

- **Performance criteria:**

After the module; training participants must be able to implement successfully waste management systems in their facilities. Therefore, they must demonstrate clear knowledge of all instruments necessary and convenient to develop, realize and monitor action plans.

6.1.21 Cleaner healthcare service

- **Training objectives:**

Cleaner healthcare service is an approach to environment management. The basic principles of cleaner service are prevention, precaution, and integration, in order to minimize or eliminate wastes that need to be treated at the end of the process. To enable the training participants to implement cleaner healthcare services with the aim to reduce the waste quantity in their facilities, this elucidates the main principles of cleaner production, gives

samples of cleaner service practices already realized and determines the necessary steps to achieve the objective.

- **Covered topics:**

Term definition; Principles of cleaner production: precaution, prevention; Cleaner service practices: housekeeping, input substitution, process control and modification, technology change, on-site recovery and reuse; Barriers; Motivators; Set-up: planning and organisation, assessment, feasibility study, implementation; Benefits and advantages

- **Performance criteria:**

The training participants must be aware of the advantages of cleaner healthcare service. They must demonstrate that they know and understand the main principles and how they must act to realize this approach.

7 Annex

- **Job Description – HWT**
- **Job Description – HWO-Operations**
- **Job Description – HWO-Monitoring**
- **Job Description – HWM**
- **Job Description - Healthcare Waste Treatment Plant Operator**
- **Job Description – HWC**