THE GAMBIA

NATIONAL HEALTH CARE WASTE MANAGEMENT PLAN

COMMISSIONED BY: NATIONAL AIDS SECRETARIAT

Consultant:
Fantamadi Associates
September 2005

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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ADB-</td>
<td>African Development Bank</td>
</tr>
<tr>
<td>AFPRC</td>
<td>Arm Forces Provisional Ruling Council Hospital</td>
</tr>
<tr>
<td>BAC</td>
<td>Brikama Area Council</td>
</tr>
<tr>
<td>BCC</td>
<td>Banjul City Council</td>
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<tr>
<td>BCRC</td>
<td>Basel Convention Regional Center</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>CRD</td>
<td>Central River Division</td>
</tr>
<tr>
<td>DHTs</td>
<td>Divisional Health Teams</td>
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<tr>
<td>DHO</td>
<td>Divisional Health Officer</td>
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<tr>
<td>DOSH</td>
<td>Department of State for Health</td>
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<tr>
<td>DPHO</td>
<td>Divisional Public Health Officer</td>
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<tr>
<td>DPHN</td>
<td>Divisional Public Health Nurse</td>
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<tr>
<td>CHN</td>
<td>Community Health Nurse</td>
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<tr>
<td>SCHN</td>
<td>Senior Community Health Nurse</td>
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<tr>
<td>EIA</td>
<td>Environment Impact Assessment</td>
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<tr>
<td>EPI</td>
<td>Expanded Program on Immunization</td>
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<tr>
<td>ESM</td>
<td>Environmental Sound Management</td>
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<tr>
<td>Gamworks</td>
<td>The Gambia Agency For The Management of Public Works</td>
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<tr>
<td>GBA</td>
<td>Greater Banjul Area</td>
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<tr>
<td>GOTG-</td>
<td>Government of The Gambia</td>
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<tr>
<td>HCPMB</td>
<td>Hazardous Chemicals and Pesticides Management Board</td>
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<tr>
<td>HCW</td>
<td>Health Care Waste</td>
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<tr>
<td>HARRP</td>
<td>HIV/AIDS Rapid Response Project</td>
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<tr>
<td>HCDS</td>
<td>Health Care Delivery System</td>
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<tr>
<td>HFs</td>
<td>Health Facilities</td>
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<tr>
<td>KMC</td>
<td>Kanifing Municipal Council</td>
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<tr>
<td>LRD</td>
<td>Lower River Division</td>
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<tr>
<td>MCH</td>
<td>Maternal and Child Health</td>
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<tr>
<td>MRC</td>
<td>Medical Research Laboratories</td>
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<tr>
<td>NAS</td>
<td>National AIDS Secretariat</td>
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<tr>
<td>NBD</td>
<td>North Bank Division</td>
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<tr>
<td>NEA</td>
<td>National Environment Agency</td>
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<tr>
<td>NEMA</td>
<td>National Environment Management Act</td>
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<tr>
<td>NEMAC</td>
<td>National Environment Management Council</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<tr>
<td>OPD</td>
<td>Out Patient Department</td>
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<tr>
<td>PNO</td>
<td>Principal Nursing Officer</td>
</tr>
<tr>
<td>PRO</td>
<td>Public Relation Officer</td>
</tr>
<tr>
<td>PVC</td>
<td>Poly Vinyl Chloride</td>
</tr>
<tr>
<td>RCH</td>
<td>Reproductive and Child Health</td>
</tr>
<tr>
<td>RVTH</td>
<td>Royal Victoria Teaching Hospital</td>
</tr>
<tr>
<td>SCHN</td>
<td>Senior Community Health Nurse</td>
</tr>
<tr>
<td>SOS</td>
<td>Secretary of State</td>
</tr>
<tr>
<td>SWOT</td>
<td>Strengths, Weaknesses, Opportunities and Threats</td>
</tr>
<tr>
<td>TBAas</td>
<td>Traditional Birth Attendants</td>
</tr>
<tr>
<td>TEQ</td>
<td>Toxic equivalent</td>
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</tbody>
</table>
URD - Upper River Division
UNEP - United Nations Environment Programmes
VHS/CHN - Village Health Service/ Community Health Nurse
VHWs - Village Health Workers
WD - Western Division
WHO - World Health Organization
WMO - Waste Management Officer
EXECUTIVE SUMMARY

There is an urgent need to improve the current Health Care Waste Management system in The Gambia. Of all the health care facilities (56 health facilities) visited across the country by the consultants, only the four facilities have in place an acceptable HCW management System. This few facilities have adequate equipment for collection storage and disposal, and procedures for segregation and collection storage and disposal of HCW. While in the rest of the facilities there is inadequate equipment and resources for the management of HCW, it is inappropriate disposed off in open places where the public especially the children can have access to it. There are no procedures in place for the collection, segregation, transportation and storage of HCW and thus increasing the risk of infections to health care workers.

The institutional capacities of health facilities in HCW management remain inadequate to handle the current waste situation. From the interviews that were conducted by the consultants less than five percent of the staff at health care facilities have had any form of training on the management of health care waste. There was also no budget allocation of HCW management except for only four facilities.. In addition there is no in-service training program on HCW Management for health staff and only a few of them have had training on HCW Management during their initial training at the university of the Gambia or Gambia College. Similarly there is no public education program to create awareness among patients, visitors and the general public towards HCW Management. Another important capacity gap that the team found was the deficient legal and regulatory framework including guidelines, procedures and standards needed to set up an acceptable HCW Management System.

Detailed information on the volume of health care waste generated was collected from:

- Royal Victoria Teaching Hospital representing a Major Hospital,
- AFPRC Hospital, representing a regional hospital in the North Bank,
- Basse Health Centre representing a Major Health Center in the Upper River Division
- The West field Clinic representing a privately owned health care facility,
- Jabot laboratory representing an independent private laboratory service.
- Banjul Pharmacy representing an independent private pharmacy.
- Brikama Ba Dispensary in CRD representing Minor Health Center

The results from each of the representative facilities were collated and extrapolated for similar facilities to cover the entire country using the waste generated per hospital bed per day as the factor. The results indicated that that about 750 kgs of waste is generated per day across health facilities in the country. Clinical waste of various categories constitutes 42.66% of the total waste generated. Non-health care waste constitutes over 50% of the total waste generated in health care facilities.
Considering the difficulty in ensuring a safe and sustainable transportation system, the risks of movement of hazardous waste, nature of the roads and consequences of system failure of a centralized HCW treatment plant, the team recommended a decentralized on site treatment and disposal facility for each HF. In this respect, Demon fort Type eight (8a) and nine (9) have been chosen. Each incinerator should have an ash pit and concrete lined pits are also recommended for the safe disposal anatomical waste and placenta especially for the urban health facilities.

The plan per see is estimated to cost US$1,500,934 from inception to completion during the five-year period and approximately US$324,200 for the first year of implementation.

The team recommended that the strengthening of legal and regulatory framework is the first priority of an effective healthcare waste management plan. National legislation is one of the basis for improving health care waste management in the Gambia. Therefore it is envisaged that the enactment of the Draft waste Bill 2003 will strengthen the regulatory framework of HCW Management. This will establish legal controls and permits for the safe HCW Management. However, the legislation must also be supported with a comprehensive national policy and technical guidelines for the implementation of the laws. The current HCW management should be standardized with robust monitoring using laws and guidelines. The standardization should include:

- Designation of WMO and Waste Management especially in all hospitals. They should have the mandate to be responsible of managing and monitoring HCW MANAGEMENT
- Establish segregation procedures and ensure its implementation at all points of waste generation through the three-bin system with associated colour coding
- Standardize waste minimization procedures
- Waste collection, storage, handling and transportation procedures

The institutional capacity at all levels of the health care delivery should be strengthened through continuous training. There is need to review the Curriculum of the National Health Training Institutions with a view of incorporating HCW management. Continuous public education to create awareness and to keep the general population well informed.
# STUDY TEAM

<table>
<thead>
<tr>
<th>NAME</th>
<th>ROLE</th>
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<tbody>
<tr>
<td>SAIKOU B.M NJAI</td>
<td>LEAD CONSULTANT/ WASTE MANAGEMENT EXPERT</td>
</tr>
<tr>
<td>MUSA MAI JALLOW</td>
<td>SOCI-ECONOMIST/FINANCIAL EXPERT</td>
</tr>
<tr>
<td>MUSA DRAMMEH</td>
<td>PUBLIC HEALTH EXPERT</td>
</tr>
<tr>
<td>ADAMA B CHAM</td>
<td>ENVIRONMENTALIST</td>
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FANTAMADI ASSOCIATES

22/02/2006
1.0 INTRODUCTION

Health-care waste (HCW) is waste generated during the cause of delivering health care services. Health-care wastes include sharps, infectious non-sharps materials, blood, body parts and fluids, chemicals, pharmaceuticals, radioactive materials. Unless these wastes are disposed of safely, the overall benefits from health-care services are reduced.

Poorly managed health-care waste exposes health-care workers, waste handlers, and the community to infections such as HIV/AIDS and Hepatitis, toxic effects, and injuries, and may damage the environment. In addition, it creates opportunities for collection, re-sale and potential re-use without sterilisation of disposable medical equipment (particularly syringes). The reuse of infectious syringes represents a major threat to public health especially in the spread of HIV/AIDS. In 2000 WHO estimated that injections undertaken with contaminated syringes caused about 23 million of infections of Hepatitis B, and Hepatitis C and HIV.

While it is the responsibility of the waste producer to dispose of the waste safely, safe management of HCW also needs to be supported and implemented by national and local authorities as well as health-care workers and waste workers.

The contribution and cooperation of a number of partners from various settings and sectors, including the health and the environment sector, the public, research institutions and private associations is needed to achieve safe and sustainable management of HCW nationwide.

Safe and sustainable management of HCW can be reached by developing, promoting and implementing good practices, safe and environment-friendly technologies, raising awareness, and promoting policy commitment and adequate regulations.

1.1 BACKGROUND TO THE STUDY

The Government of the Gambia has received support from the International Bank for Reconstruction and Development (IDA / World Bank) to implement the HIV/AIDS Rapid Response Project (HARRP) with the aim of preventing and mitigating the impact of HIV/AIDS in The Gambia.

Cognisant of its implications, the handling, collection, disposal and sound management of HIV/AIDS contaminated materials are key environmental and public health issues in the program. Therefore a medical waste management plan appropriately costed with clear institutional arrangements for implementation is required. The improper management of HIV/AIDS infected materials impose serious
risk to not only Health care workers, cleansing service workers but also to families and children who scavenge/ adventure on dumpsites.

1.2 STUDY OBJECTIVES

The objective of the study is to identify the level of health care waste management that will be relevant to help implement and enforce proper health and environmentally sound, technically feasible, economically viable and socially acceptable systems for management of health care waste in The Gambia.

1.3 METHODOLOGY.

The team reviewed various literature and legislation relevant to the study. The literature review was followed by a field visit to health facilities (56) across the country to collect information and appraised the current health care waste management practices. During the field visits various waste disposal sites both formal and informal were also assessed.

However the team felt that both the literature review and the filed visit failed to provide adequate data on waste generation levels that could be used as the basis for designing the National HCW Management Plan. Therefore the team conducted a detail assessment of representative health facilities across the country. This detail assessment involved segregation of waste in to the following categories at each of the representative facilities:
General waste, sharps,

Each of the categories is weighed and recorded daily in a designed form (see annex 3) for eight (8) consecutive days. The team conducted a one-day training at each of the representative facilities for the staff identified for the carrying out the segregation and weighing of the waste for the assessment period. Each of the representative facilities was supplied with a weighing scale, dustbins and protective gears to facilitate the exercise. Data from this exercise was used to arrived at the total amount of HCW generated nationally.
2.0 ORGANISATIONAL, LEGAL AND REGULATORY FRAMEWORK

The Department of State for Health (DOSH) is the principal provider of health services throughout the country. Public health services are provided through a network of hospitals, major and minor health centers, dispensaries, sub-dispensaries and Primary Health Care Services. Non-Governmental Organization (NGOs) and private clinics and pharmacies, which mainly exist in Greater Banjul Area, also provide health services. In addition, there are a large number of private pharmacies, drug sellers, and traditional healers that also provide some form of health services.

2.1 Structure of the Public Health Care Services

The structure of the public health care services is organized into a three-tier system based on the Primary Health Care (PHC) Strategy formulated in 1985/86. The three levels are:

- Primary Level (Community level)
- Secondary Level (Intermediate level)
- Tertiary Level (Final Referral point)

Primary Level:

This is the smallest unit that serves as the entry point for communities into the general health care services. PHC was introduced in 1980/81 to empower communities to take ownership of their own health. Primary health care villages have been selected from those communities with a population over 400 or from those located in relatively isolated areas. The Primary Health Care network consists of 492 health posts, organized into 69 circuits and staffed with Village Health Workers (VHWs) and Traditional Birth Attendants (TBAs) who are supervised by Village Health Service/Community Health Nurses (VHS/CHNs) based in key villages. In a number of the PHC villages, physicians have also been posted along with either a more qualified/trained nurse in most cases or a community health nurse attendant to provide outpatient services. However, the team found that none of these PHC villages had a physician at the time of the field visit.

Secondary Level:

This level consists of a network of designated major and minor health centers, and dispensaries, which provide service below the tertiary level with more specialized staff and equipment. These facilities provide the core outpatient (OPD) clinics and the Maternal and Child Health (MCH) services now referred to as Reproductive and Child Health (RCH). OPD clinics are usually run daily for all ages. RCH clinics provide most of the health care services to children under the age of five years (Infant Welfare Clinic, IWC) and antenatal care services for pregnant women through base clinics at facility and outreach stations. RCH base clinics are held at the facility one or two days per week and for the rest of the week, a Team treks to a schedule of outreach...
clinics in each health facility’s catchment area. These stations are visited one to two times a month, depending on the size of the catchment area.

- **Major Health Centers:** The 6 designated major health centers in the country perform minor surgeries depending on the availability of staff and equipment. They also conduct deliveries.

- **Minor Health Centers:** The 13 designated minor health centers admit patients but do not do perform surgery except eye surgery, which is handled by the National Eye Care Program-trained staff. These centers provide labour and delivery services.

- **Dispensaries:** There are 16 designated dispensaries which provide labour and delivery services. Officially they are not required to admit patients and are only limited to detaining them for observation or whilst awaiting referral.

**Tertiary level (Referral Hospitals):**

There are currently four major referral hospitals namely Royal Victoria Teaching Hospital in Banjul, Bansang Hospital in Bansang, AFPRC Hospital in Farafenni and Sulayman Junkung General Hospital which is not yet officially inaugurated but have started running general health services including minor surgeries. Another hospital is under construction in Kanifing Municipality. Referral hospitals provide the highest specialized health care services for patients whose conditions cannot be managed at the above-mentioned basic health facilities. In addition, they also provide X-ray, laboratory and blood transfusion services among others.

The RVTH provide professional support to the primary and secondary levels and serve as an avenue for training of professional staff and specifically for medical education at the University of The Gambia.

**Private Health Care Services**

Non-governmental organizations (NGO’s) and private health facilities and clinics compliment the efforts of the public health facilities in delivering health care services. There are thirty-four (34) private/NGO health facilities in the country, with most of them in the Greater Banjul Area. In addition there are a few private laboratories that provide laboratory services particularly in the Greater Banjul Area.
Table 1.1

Summary of the number of health care service points at each Division.

Distribution of Public, and private and NGO Health Facilities 2005

<table>
<thead>
<tr>
<th></th>
<th>WD, KMC, BCC</th>
<th>NBW</th>
<th>LRD</th>
<th>NBE</th>
<th>CRD</th>
<th>URD</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>803,930</td>
<td>97,469</td>
<td>74,349</td>
<td>106,476</td>
<td>185,107</td>
<td>209,256</td>
<td>1,476,587</td>
</tr>
<tr>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
</tr>
<tr>
<td>Hospital</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Major H/C</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Minor H/C</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>Dispensary</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>16</td>
</tr>
</tbody>
</table>

Total Public (Government) Health Facilities: 39

| NGO/Private clinics including others | 27 | 2 | 1 | 2 | 2 | 0 | 34 |

Sources: Government Divisional Health Teams and DPI, 2005
Others include major pharmacies, and Laboratories

Traditional Healers

Patients have different worldviews, believes, religious views and understandings of health and disease. Traditional healers are not new in The Gambia and they have been providing a form of health service ranging from herbalist, spiritual/ritual purification, bone setting and skin laceration/tattooing. The Department of State for Health in collaboration with WHO has established a unit in 2000 to coordinate traditional medicine services.

2.2 Organisation of the Public Health Services Administration

The organisation of health services for administrative purposes is divided into National or central level and the Divisional level.

National Level

The Department of State for Health (DOSH), which is headed by the Secretary of State for Health, is the body responsible for formulating health policy, setting standards and quality assurance.
There are three functional units – the Directorate of Health Services, planning and information and support services – which assist the office of the Secretary of State (SOS) mobilise resources, plan and develop capacity, propose and review Health legislation, monitor and evaluate the sectors performance and build both local and international partnerships.

**Divisional Level: (Operational Management and Service Delivery)**

In line with government's policy of decentralizing public service delivery and to promote and ensure an effective and efficient public health sector, the Department of State for Health (then called Ministry of Health) in 1993 expanded the three Health Regions to 6 health divisions managed by Divisional Health Teams (DHTs).

The Divisional Health Teams are responsible for planning and managing divisional health services, implementing the health sector investment program at the divisional level, controlling communicable diseases, providing and disseminating health education, protecting the environment, participating in health research and building community partnerships.

### 2.3.1 International Treaties and Conventions

The Gambia is a party to a number of International Convention and treaties. Significant to Medical Waste Management is the Basel Convention that is concerned with the trans-boundary movements of hazardous wastes which is also applicable to medical waste.

Stockholm Convention on Persistent Organic Pollutants is also relevant to the management of Medical Waste. Two of the twelve POP chemicals covered by the Stockholm convention are Dioxin and Furan. According to the Dioxin and Furan inventory report of the Gambia (Njai et al 2002) medical waste is one of the source categories of Dioxins and Furans in the Gambia.

### 2.3.2 National Policies and Legislations

There are a number of legal provisions, which regulate the Health sector and provide standards and guidelines for the management of the Sector. There are currently no specific laws or regulations or technical guidelines for the management of healthcare waste. The most important legal and policy provisions relevant to the management of Healthcare waste include the Public Health Act 1990 and the draft revised Public Health Act 2001, the National Health Policy Changing for Good (1994-2000) the draft Environmental Health Policy 2001, The Infection Control Policy of Hospitals, the Drug Policy, National Environment Management Act 1994 (NEMA), the Environmental Management Discharge Permit Regulations 2001, Draft Waste Bill 2003.
2.3.2.1  The Drug Policy

One of the aims of the drug policy is to ensure that all unwanted drugs and medical supplies and associated waste are disposed of promptly, efficiently and safely. It recommends suitable measures to be instituted for the regular identification, collection and safe disposal of expired or otherwise unwanted drugs and medical supplies in public health facilities, through inter-sector collaboration with stakeholders in order to minimize hazard to the community and damage to the environment. In addition, the policy mandates the Medicines Board to ensure that suitable methods of disposal of unwanted or pharmaceutical waste, medical and surgical items are in operation in the private sector including the department of livestock services. However despite this policy being in place health facilities seem to have a serious problem of appropriately disposing of medical waste such as expired drugs. At consultations with the staff of RVTH, it was indicated that the disposal of donated medical supplies that are unusable due to the fact that they are expired, obsolete or not needed is a serious issue.

2.3.2.2. The Public Health Act 1990.

The Public Health Act was enacted to make provision for public and environmental health connected matters. This Act empowers the Secretary of State to make regulations regarding the collection, removal and sanitary disposal of rubbish, night soil and other offending matters. The Act also mandates the Director of Health Services who heads the Department of Public Health Services to abate nuisances and to remove or correct any condition that may be injurious to public health. It empowers public health officers to monitor environmental and public health regulations.

Regulation 23 empowers the Medical Officer for Health by notice in writing to order, inter alias, the removal of all collections of water, sewage, rubbish, refuse, odour or other fluid or solid substances. The 1990 Public Health Regulation does not make specific provision for the management of HCW.

However, the draft Public Health Act 2001 has made provision of HCW. Section 23 of the revised Public Act 2001 empowers the Secretary of State for Health (SOS) to set guidelines for the storage or disposal of soiled or infected equipment, materials and infected organs from a hospital, health center or medical treatment unit. The regulation fails to make provision for other HCW such as pharmaceutical, radioactive and chemical waste.
2.3.2.3 The National Health Policy- Changing For Good (1994-2000)

The policy was envisaged as a framework for future National Health Development; with the aim of improving the health status of The Gambian population to enable them live an economically productive life. While there was clarity of purpose, with good intentions to provide an efficient and effective service, environmental health issues have not been addressed in particular HCW management.

2.3.2.4 The Draft Environmental Health Policy

The draft Environmental Health Policy has identified poor solid waste management as a major health problem particularly in the urban centres. This policy also fails to address specifically the management of HCW among its policy issues.

2.3.2.5 Infection Control Policy of Hospitals

Of all the hospitals visited only RVTH has a policy on infection control. This policy of RVTH has outlined procedures, practices in order to minimise exposure to blood and other infectious material. It also makes provisions for proper collection and disposal of waste with emphasis on either treatment of infectious waste (autoclaving) before disposal to Banjul City Council’s Dumpsite or Health care waste disposal by incineration. The document does not make provisions for segregation of waste. The manner in which waste management will be planned and monitored has also not been addressed.

However, the implementation of the policy is highly constrained by limited resources.

The AFPRC Hospital is in the process of preparing a Waste Management Policy. Even though this policy document is incomplete, a waste management team which is part of the structures for the implementation of the policy are in place.

2.3.2.6 National Environment Management ACT 1994

The National Environmental Management Act (NEMA), 1994, is the major instrument of environmental legislation in the Gambia. NEMA established the National Environmental Management Council (NEMAC), and the National Environment Agency (NEA).

The NEMAC is chaired by the President of The Gambia, and brings together the Secretaries of State from all key Government Departments whose activities may impact the environment and whose mandate include monitoring developments relating to the environment.
The NEA serves as the secretariat to the NEMAC; The NEMAC sets policies to be enacted by NEA; it monitors the activities of the NEA; and it adopts standards, guidelines and regulations proposed by NEA. The NEA itself is the institution responsible for the management of the environment and co-ordinate all activities of the Government in this field. In doing so, it is responsible for liaison with all Government and external agencies, NGOs, interest groups and the general public. Among its activities, the following are of interest in relation to Solid waste management policies

1. Liaise with the private sector on all issues relating to the environment.
2. Prepare proposals to environmental policies and strategies.
3. Initiate legislative proposals, standards, guidelines and regulations.
4. Promote public awareness of environmental issues.
5. Review Environmental Assessment, Audits and Monitoring.
6. Establish environmental criteria and quality measuring standards.
7. Prevent regulate and monitor the discharge of substances harmful to the environment. (Environmental Management Discharge permit Regulations 2001).

In part A of the Schedule to the Act, Environment Impact Assessment (EIAs) are specifically required for sites earmarked for solid waste disposal, such as landfills and incinerators and for hazardous waste disposal.

The NEMA is an Act of general legislation that, provides a legal framework for activities in the environmental sector, and does not address healthcare waste management issues in detail. Accordingly, since the enactment of NEMA, there have been significant regulatory gaps in the management and control of waste. The Environmental management Discharge Permit Regulations 2001 were developed to control discharges of dangerous substances into the environment. Accordingly, the waste management Bill, 2003, has been drafted to target those gaps and weaknesses in current legislation with regard to waste.

2.3.2.7 WASTE MANAGEMENT BILL, 2003

The Draft Waste Management Bill is the only specific legislation on waste. It has provision for the development of regulations on special waste streams such as medical waste, industrial waste etc. When this Bill is enacted a specific regulations that will address the current legal gaps on the management of medical waste could be formulated.
The key instrument in the Bill is the establishment of Waste Regulatory Authority to control waste collection and disposal throughout The Gambia. The Authority, which will be under the NEA, will in turn set waste collection and waste disposal Authorities for each locality and will be empowered under the Bill to develop the duties of these local authorities to the local municipal or area councils. In effect, therefore, it will be the local councils that will provide the waste collection and disposal services, but under the direction and control of the Waste Regulation Authority.

The Waste Regulation Authority will be empowered to issue waste licenses to landfill site owners/operators and to vehicle owners/operators involved in waste collection services. The Authority may delegate this role to the local municipal councils as part of its duties as the waste collection and waste disposal authority. The license fee is to be set by the Secretary of State, but is paid to the Authority (or local council, as the case may be). The licenses can be revoked if the operator’s fitness is called into question by a conviction for a waste management offence, or for endangering public health or causing pollution through his activities. In such cases, the operator has the right of appeal to the Secretary of State if he feels that he has been treated unfairly.

2.3.2.8 HAZARDOUS CHEMICALS AND PESTICIDES CONTROL AND MANAGEMENT ACT 1994

To regulate the use of hazardous chemicals and pesticides, the Hazardous Chemicals and Pesticides Control & Management Act was enacted in Parliament in April 1994 making it compulsory to register all hazardous chemicals and pesticides sold and used in the Gambia.

This regulatory framework replaced the 1983 Pesticides Management Act and made the provision for the establishment of Hazardous Chemical and Pesticide Management Board (HCPMB), a regulatory body responsible for the registration, licensing and management of all hazardous chemicals & pesticides. It also makes provisions for enforcement. The National Environment Management Act, to a certain extent does address environmental pollution including pollution from chemicals. Other legal instruments that directly or indirectly address chemical management are:

National legislation is one of the basis for improving health care waste management in any country. It establishes legal controls and permits for the institution responsible for the disposal of HCW to apply pressure for implementation. The legislation must also be supported with a comprehensive national policy and technical guidelines for the implementation of the laws.

A national law on HCW Management will enable a country to establish a national HCW Management policy set strict procedures and guidelines for Health Care Waste Management, define duties and responsibilities for each stakeholder in the Health Care Waste Management system.
3.0 BASELINE DATA ON THE HEALTHCARE WASTE GENERATION

3.1 Health Care Waste Generation

In order to identify the requirements for a proper Health Care Waste Management System it is necessary to obtain good estimates of the volume and type of waste generated by the health care facilities. In many developing countries like the Gambia complete and detailed information of waste volume generated is not readily available and therefore in many instance waste generation data must be collected from sample surveys. The consultant carried out sample surveys at representative health facilities which was used to estimate the volume of waste generated.

3.1.1 Types Of Healthcare waste Generated

Healthcare facilities produce two distinct types of waste: General waste and clinical waste. Whereas general waste is synonymous with household waste, which in health care facilities consists mainly of food items, plastic bags, paper etc, clinical wastes are categorized as follows in this study.

Pathological waste: includes all human tissues (infected or not) such as limbs, organs, placenta, fetuses, tissues from laboratory, blood and other body fluids

Infectious waste: includes soiled surgical dressings, swabs, and other contaminated material from treatment areas, material that has been in contact with a person(s) suffering from infectious/communicable diseases, cultures and stocks of infectious agent from laboratories, waste from patients in isolation wards and any other material, apparatus such as bed linen, disposable gloves, towels equipment etc which may contain pathogens in sufficient concentration or quantity that exposure to it could result in disease.

Pharmaceutical waste: includes Pharmaceutical products, drugs and chemicals that have been spilled, soiled, expired, contaminated or are to be discarded for any reason.

Chemical waste: includes discarded liquid, solid or gaseous chemical from healthcare laboratories or other sources such as diagnostic work, experimental work, cleaning and disinfection procedures. Chemical waste can be hazardous or non hazardous.

Radioactive waste

Radioactive waste includes waste generated from mainly the X-ray department which contain radio active isotopes or contaminated with radioactive material. Radioactive waste can be divided into two groups ie those in sealed sources and those in open sources. Sealed sources are those in which the radio active isotopes are sealed into the source for use as an instrument or a component. The isotope
cannot be separated from the component and is usually of a much higher activity than the open source.

The open sources are those in which the Isotope itself is used e.g. the vitro analysis of body tissue and fluid. Waste generated by this type of treatment or used can be gaseous, liquid or solid.

**Sharps:** includes needles, syringes, scalpels, blades, saws, nails, broken glass and any other items used in medical facilities that could cut or prick a person and cause injury.

### 3.1.1 Methodology

In accordance with the Terms of Reference of the study, detailed information on the volume of health care waste generated was collected from the Royal Victoria Teaching Hospital representing, (the Major Hospital), AFPRC Hospital, (the regional hospital) in the North Bank, BrikamaBa Dispensary in CRD (represents minor health centers), Basse Health Center (Major Health Center) in the Upper River Division the West field Clinic representing a privately owned health care facility, Jobot laboratory (independent private laboratory service) and Banjul pharmacy.

Suitable staff at each facility was identified and trained to segregate the waste generated daily into various categories highlighted above. Each category of waste collected is weighed each day for one week and the results entered in a table provided.

The results from each of the representative facilities were collated and extrapolated for similar facilities to cover the entire country using the waste generated per hospital bed per day as the factor.

### 3.1.2 Analysis of Results

The results of the surveys are presented in Table 3.1 below, which indicates that about 750 kgs of waste is generated per day across health facilities in the country.
Table 3.1 Health Waste Generated in Kgs.

<table>
<thead>
<tr>
<th>Major Hospital</th>
<th>Private</th>
<th>Regional</th>
<th>Health Care Private Clinics</th>
<th>Dispensary</th>
<th>Total Health Care Waste Generated</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of Beds</td>
<td>557.00</td>
<td>75.00</td>
<td>500</td>
<td>610.00</td>
<td>142 n/a</td>
</tr>
<tr>
<td>Sharps</td>
<td>3.87</td>
<td>0.52</td>
<td>16.95</td>
<td>31.80</td>
<td>8.03 9.24</td>
</tr>
<tr>
<td>Infectious</td>
<td>41.59</td>
<td>5.60</td>
<td>19.33</td>
<td>41.83</td>
<td>11.89 12.51</td>
</tr>
<tr>
<td>Pathological</td>
<td>11.64</td>
<td>1.57</td>
<td>10.95</td>
<td>0.00</td>
<td>0.00 0</td>
</tr>
<tr>
<td>Radioactive</td>
<td>0.00</td>
<td>0.00</td>
<td>0.71</td>
<td>0.00</td>
<td>0.00 0</td>
</tr>
<tr>
<td>Chemical</td>
<td>0.00</td>
<td>0.00</td>
<td>6.67</td>
<td>2.46</td>
<td>0.00 0</td>
</tr>
<tr>
<td>Pharmaceutical</td>
<td>3.34</td>
<td>0.45</td>
<td>22.14</td>
<td>43.88</td>
<td>7.44 6.38</td>
</tr>
<tr>
<td>Total Health Care Waste</td>
<td>60.44</td>
<td>8.14</td>
<td>76.76</td>
<td>119.97</td>
<td>27.35 28.13</td>
</tr>
<tr>
<td>General Waste</td>
<td>152.39</td>
<td>20.52</td>
<td>94.75</td>
<td>112.68</td>
<td>22.74 27.35</td>
</tr>
</tbody>
</table>

Clinical waste of various categories constitutes 42.66% of the total waste generated which suggests that the greater proportion of waste generated in Health Care facilities across the country is general waste. Non-health care waste constitutes over 50% of the total waste generated in health care facilities, which seems to support the concern expressed by health personnel that visitors and patient escorts are a significant source of waste in the health facilities of The Gambia.
The Chart Below gives a breakdown of the constituents of Health Care Waste in the Country.

Chart 3.1

Health Care Waste Generation per category, 2005

As only a negligible amount of chemical and radioactive waste is generated, infectious waste constitutes the greater percentage (41%) of Health Care Waste followed by Sharps and pharmaceutical waste. However, it should be noted that the results are based on weight and there are visual indications that in volume terms sharps may constitute a greater proportion of Health Care Waste generated.

The waste generation data for the Major Health Facilities in the Greater Banjul Area is presented in Table 3.3 below. Understandably the Royal Victoria Hospital being the only teaching hospital and the largest in size and capacity 557 hospital beds generates the largest quantity of all categories of waste.
### Table 3.2 Healthcare Generated in Major Hospitals –KMC

<table>
<thead>
<tr>
<th></th>
<th>Public</th>
<th>Private</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RVH</td>
<td>AHMADIYA</td>
<td>MRC Fajara</td>
</tr>
<tr>
<td>No of Beds</td>
<td>557</td>
<td>35</td>
<td>40</td>
</tr>
<tr>
<td>Sharps</td>
<td>3.87</td>
<td>0.24</td>
<td>0.28</td>
</tr>
<tr>
<td>Infectious</td>
<td>41.59</td>
<td>2.61</td>
<td>2.99</td>
</tr>
<tr>
<td>Pathological</td>
<td>11.64</td>
<td>0.73</td>
<td>0.84</td>
</tr>
<tr>
<td>Radioactive</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Chemical</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Pharmaceutical</td>
<td>3.34</td>
<td>0.21</td>
<td>0.24</td>
</tr>
<tr>
<td>Total Health Care Waste</td>
<td>60.44</td>
<td>3.80</td>
<td>4.34</td>
</tr>
<tr>
<td>General Waste</td>
<td>152.39</td>
<td>9.58</td>
<td>10.94</td>
</tr>
</tbody>
</table>

Table 3.3 below indicates that the regional hospitals are a major source of hospital waste after the Royal Victoria Teaching Hospital even though the medical waste generated from all of them combined (94kg/day) is below the amount generated from RVTH (152kg/day)

### Table 3.3 HealthCare Waste Generated by Regional Hospitals

<table>
<thead>
<tr>
<th>Hospital</th>
<th>BWIAM HOSPITAL</th>
<th>AFPRC</th>
<th>BANSANG</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of Beds</td>
<td>200</td>
<td>150</td>
<td>150</td>
<td>500</td>
</tr>
<tr>
<td>Sharps</td>
<td>6.78</td>
<td>5.09</td>
<td>5.09</td>
<td>16.95</td>
</tr>
<tr>
<td>Infectious</td>
<td>7.73</td>
<td>5.80</td>
<td>5.80</td>
<td>19.33</td>
</tr>
<tr>
<td>Pathological</td>
<td>4.38</td>
<td>3.29</td>
<td>3.29</td>
<td>10.95</td>
</tr>
<tr>
<td>Radioactive</td>
<td>0.29</td>
<td>0.21</td>
<td>0.21</td>
<td>0.71</td>
</tr>
<tr>
<td>Chemical</td>
<td>2.67</td>
<td>2.00</td>
<td>2.00</td>
<td>6.67</td>
</tr>
<tr>
<td>Pharmaceutical</td>
<td>8.86</td>
<td>6.64</td>
<td>6.64</td>
<td>22.14</td>
</tr>
<tr>
<td>Total Health Care Waste</td>
<td>30.70</td>
<td>23.03</td>
<td>23.03</td>
<td>76.76</td>
</tr>
<tr>
<td>General Waste</td>
<td>54.72</td>
<td>20.01</td>
<td>20.01</td>
<td>94.75</td>
</tr>
</tbody>
</table>
### Table 3.4 Waste Generated by Major Private Clinics

<table>
<thead>
<tr>
<th>Hospital Beds</th>
<th>Sharps</th>
<th>Infectious</th>
<th>Pathological</th>
<th>Radioactive</th>
<th>Chemical</th>
<th>Pharmaceutical</th>
<th>Total</th>
<th>General Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamtoro</td>
<td>48</td>
<td>2.71</td>
<td>4.09</td>
<td>0.00</td>
<td>0.00</td>
<td>2.51</td>
<td>9.31</td>
<td>7.69</td>
</tr>
<tr>
<td>Ndeban</td>
<td>18</td>
<td>1.02</td>
<td>1.53</td>
<td>0.00</td>
<td>0.00</td>
<td>0.94</td>
<td>3.49</td>
<td>2.88</td>
</tr>
<tr>
<td>Kololi Clinic</td>
<td>12</td>
<td>0.68</td>
<td>1.02</td>
<td>0.00</td>
<td>0.00</td>
<td>0.63</td>
<td>2.33</td>
<td>1.92</td>
</tr>
<tr>
<td>Westfield Clinic</td>
<td>24</td>
<td>1.36</td>
<td>2.04</td>
<td>0.00</td>
<td>0.00</td>
<td>1.26</td>
<td>4.66</td>
<td>3.84</td>
</tr>
<tr>
<td>Jahali</td>
<td>27</td>
<td>1.53</td>
<td>2.30</td>
<td>0.00</td>
<td>0.00</td>
<td>1.41</td>
<td>5.24</td>
<td>4.32</td>
</tr>
<tr>
<td>Bambo Clinic</td>
<td>6</td>
<td>0.34</td>
<td>0.51</td>
<td>0.00</td>
<td>0.00</td>
<td>0.31</td>
<td>1.16</td>
<td>0.96</td>
</tr>
<tr>
<td>Bremen Clinic</td>
<td>7</td>
<td>0.40</td>
<td>0.40</td>
<td>0.00</td>
<td>0.00</td>
<td>0.37</td>
<td>1.16</td>
<td>1.12</td>
</tr>
<tr>
<td>Total</td>
<td>142</td>
<td>8.03</td>
<td>11.89</td>
<td>0.00</td>
<td>0.00</td>
<td>7.44</td>
<td>27.35</td>
<td>22.74</td>
</tr>
</tbody>
</table>
The results indicate that medical waste constitutes a greater proportion of the total waste generated, which is different from the results revealed in the public health facilities. In public health facilities general waste constitutes a higher proportion of the total waste generated. This indicates that the private clinics have achieved greater success in minimizing the general waste in their facilities. They also seem to achieve greater success in segregating waste at source.

Conclusion

The volume and type of waste generated has significant implications for the number and type of equipment and technology that can be applied in the segregation, transportation treatment and disposal of waste in an environmentally safe manner.

It is noticeable that there are hardly any radioactive wastes generated by the health care facilities and the relatively low level of pathological waste within the medical waste collected at the hospital might lend credence to observation that some of the placentas resulting from deliveries are handed over to the patients’ escorts for disposal.
4.0 APPRAISAL OF CURRENT HEALTH CARE WASTE MANAGEMENT PRACTICES

The team visited a total of 56 health facilities, which include both public and private health facilities and observed the methods; equipment used in Healthcare waste management and collected information on awareness of healthcare waste management best practices. It is apparent that there is low awareness on HCW Management best practices.

4.1 Health Care Waste Generation

The Healthcare facilities visited produce two distinct types of waste: General waste and clinical waste. Whereas general waste is synonymous with household waste, which includes food items, plastic bags, paper; clinical wastes produced include mainly, sharps infectious waste pharmaceutical, pathological. Radioactive and Chemical waste are found to be produced in small quantities.

The main contributing factors towards the HCW generation include medical items donated to health facilities, the inappropriate usage of disposable items and stuff brought in by patient escorts/visitors Some of these medical items include drugs that are almost expired plus obsolete medical equipment and accessories.

4.2 Segregation of Health Care Waste

Segregation of sharps is practiced by all facilities visited. Most of the facilities are equipped with WHO special sharp boxes. Others use empty metal or plastic tins to segregate sharps, where the WHO special sharp boxes are not available. However sharps were found co-disposed with other wastes in most of health facilities even though sharp boxes were available demonstrating failure in segregation.

All other categories of HCW are co-disposed with general waste. This is due to the fact that only one bin is available at the points of generation. Thus all type of waste generated at such points end up in that single bin.

In hospitals especially RVTH, some of the highly infectious waste from hospital laboratories are treated before disposal through the use of autoclave (for example blood samples). However intravenous linings, recapped needles, bandages, swaps and so on have been regularly seen mixed with general waste in dustbins outside their direct sources of generation.

In some facilities pharmaceutical wastes e.g. empty vials are placed in cartons for re-use as containers for eye drops and GV.paint. In some instances empty vials are disposed off in dustbins or sharp containers. Expired drugs are kept in cartons in the main drug store of the facility.
Waste From the X-ray units e.g. used or spoilt X-ray films are temporarily kept in empty cartons within the source and then mixed with general waste in dustbins for disposal. Similar to the placenta X-ray films are handed to the patient after diagnosis thus suggesting difficulty in quantifying amount of waste produce in this area.

Anatomical waste like placenta are handed over to escorts/relatives for burial. In some facilities such as RVTH and Serekunda H/C placenta are sometimes disposed off with other medical and general waste.

4.3 Collection, and Transportation

In most of the facilities, general waste is collected into plastic or metal bins (made from empty barrels), which are placed outside the wards to serve as waste receptacles. Cartons are also used for collection of waste in some facilities. Health labourers and orderlies are responsible for waste collection in all the facilities throughout the country.

The frequency of collection of wastes from wards/points of generation within the facility ranges from once to twice a day with no specific time schedule. However, collection is mostly done in the mornings. In some of the facilities where the local authority collects HCW for example KMC and BCC, the frequency of collection ranges from once to twice a week.

The team observed the following problems:

- Collection of waste from the health facilities is not done on regular basis
- Inadequate collection receptacles both inside and outside
- Empty cartons used as waste collection receptacles
- Lack of Personal protective equipment for waste handlers e.g. orderlies, cleaners and health labourers. In most health facilities, orderlies are only issued with surgical gloves that do not provide adequate protection against sharps.
- Wheel barrows used for waste collection are also used for other purposes such as transportation of water and bags of rice
- Physical/manual carrying of waste bins by cleaners.
- Almost all the bins seen do not have lids and none of them has linings.

It is important that HCW be regularly collected and transported to a storage area within the facility to avoid accumulation and risks. For safe collection of HCW it is recommended that a three-bin system (sharp containers, general waste and clinical waste) be available at each point of generation as well as the means of transport that should be easy to load and unload. There should be no sharp edges that may damage waste bags and containers and the containers should be dedicated to the purpose and be easy to clean. The waste collection receptacles should have lids to reduce risks of disease transmission, offensive odour and accessibility by flies and vermins.
4.4 Onsite Storage

All the public health facilities visited do not have onsite waste storage facilities. HCW bins or containers especially sharp boxes are stored in offices/wards. However in the hospitals there is waste storage ground/point where wastes are stored while waiting for municipal waste collectors. In other health facilities waste are taken straight to the disposal where they are kept till they are burnt or incinerated. Both the designated storage and disposal sites are not secured and lack of protection from weather e.g. sun, wind and animals like cats and dogs.

4.3 Final Disposal

Figure 1 Disposal of HCW in an Old Well

Among the facilities visited only MRC stations and two public health facilities (Kudang and Kaur Health Centers) dispose off their waste by incineration. The former also has a concrete pit for the final disposal of ash while the latter do not have. With regards to other facilities, old wells or latrines within the facility or close by are used to dispose off clinical waste. HCW is also dump in concrete pits and burned later. Burning of HCW in old barrels has also been observed.

In Kuntaur, open burning of unsorted waste is conducted on the banks of the river.

With the construction of centralized De Mont fort Incinerators at each DHT, most public health facilities transport their sharp boxes to DHT for incineration. These boxes are transported to the DHT either when there is a referral, or during collection of supplies. The DHTs also collect sharp boxes during their supervisory visits to health facilities.

Generally Transportation of sharp boxes to centralized incinerator is irregular. Transport has been identified as a major constraint in transportation of sharp boxes to DHTs.

Special mention must be made of the disposal of anatomical waste since it is affected by cultural believes and tradition and Healthcare workers are always faced with the dilemma of whether to allow these believes to override prudence in preventing possible contamination and infection. Placentas have mainly been claimed by relatives/escorts of the delivered mothers for burial at home because it is believed that the method of disposal affects the future delivery of the mother.
4.5 Risks Associated With Present Disposal Methods

There are numerous risks associated with the present disposal methods and the most significant ones include the following:

- **HIV/AIDS**

  The improper management of HIV/AIDS infected materials impose serious risk to not only Health care workers, cleansing service workers but also to families and children who scavenge/ adventure on dumpsites.

  Poor management of HCW can cause serious disease to health workers, waste workers, patients and the general public. The greatest risk posed by HCW particularly infectious waste are needle stick injuries that can cause HIV infection.

  During the handling of wastes, injuries occur when used needles or other sharps have not been collected in puncture proof receptacles. Inappropriate design and over flow of existing sharp containers as well as unprotected pits significantly increase risk exposure of health personnel, waste workers, scavengers and community at large to needle stick injuries.

  The re-use of infectious syringes constitutes a serious threat to public health. In 2000, WHO estimated injections by contaminated syringes caused about 23 million infectious of Hepatitis B, Hepatitis C and HIV.

  Such situations are very likely to occur when HCW is disposed of in an unsecured site where it can be easily accessed. Children are attracted to newly disposed waste containing syringes and needles and gloves which they collect to play with thus exposing them to the risks of injury and HIV/AIDS infection.

- Air pollution due to toxic emissions from open burning

  Open burning of HCW waste can cause serious air pollution through the emissions of highly toxic gases such as dioxins and furans.

- Contamination of ground water from disposal in old wells and pits

  When waste is disposed in an old well or pits that is not lined or too closed to water table the hazardous properties of the waste could be contaminate ground water.

- River water contamination from dumping on the edge of the river

  Disposal of HCW on riverbanks can pollute the water and hazardous to aquatic life such as fish. Human beings in turn may consume the contaminated fish.

- Injury and transmission of infections to health facility staffs especially Cleaners.
The waste handlers do not have appropriate personal protective equipment to protect them from the risk of infection and injury. Surgical gloves have been found to be used by orderlies for both cleaning and waste handling which cannot provide adequate protection against sharps. The physical/manual carrying of waste bins that do not have lids or are linking exposes them to risks of infection and injury.

- Contamination of food items transported with wheelbarrows used to transport HCW. The transportation of food items by wheelbarrows used for transportation of HCW can contaminate food items with pathogens or toxic substances.

- Easily accessed by scavenging livestock/other animals, flies, rodents and vermins. Unsecured disposal and storage sites will provide breeding ground for flies, cockroaches, and vermins, which in turn can promote the spread of diseases.

**Figure 2:**
Dumping of HCW at the edge of River Gambia

**Figure 3:**
Open Burning of HCW in A Pit within a HF
Figure 4:
De MontFort 8a incinerator

Figure 5:
Barrels used to burn HCW

Figure 6:
Improvised sharp containers

Figure 7:
Un-segregated HCW
5.0 DETERMINATION OF TECHNOLOGY

The improper disposal of Healthcare waste causes not only serious health but also environmental problems. Environmental problems such as air, water and land pollution can arise from the mere generation of HCW and during the process of collection, storage transportation and final disposal and even beyond. Although such problems cannot be completely mitigated, they could be minimized. The minimization of risks and problems associated with health care waste is a factor of the management method used (from generation to final disposal and after care of disposal site), the level of awareness and training of personnel handling HCW and the resources available for HCW management.

The determination of technology to use for the final disposal of HCW is inextricably link to the amount of waste generated and the resources available. The technology to be used for the final disposal of HCW in the Gambia was based on the best available technology and the best Environmental practice (BAT/BEP) under the current circumstances. The various options available for the final disposal of HCW were evaluated.

5.1 LANDFILLING

There is currently no sanitary landfill in the country. There are three authorized Dumpsites namely Bakoteh, Mile II, and Tambana in KMC, Banjul, and Brikama respectively. Most of the health care waste generated in these three municipalities finds its way to these dumpsites. In all these sites domestic waste is co-disposed with HCW including sharps. None of these sites are fenced and there is no control over the tipping. Children and animals frequent the sites and the waste is frequently burnt.

In order to consider the option of Land filling of HCW in the Gambia, there needs to be a landfill in the first place, appropriately secured and equipped to ensure the proper management of HCW. This option will be too expensive to provide for all the regions of the country both in terms of initial and operational costs. Secondly, even if a land fill is available, HCW needs to undergo some form of treatment to decontaminate at the level of health facility.

5.2 INCINERATION

Incineration is a high temperature (over 650 degrees Celsius) oxidation process that reduces the volume of solid waste by removing combustible matter. Incineration of HCW reduces volume; destroy Pathogens, converts hazardous constituents into non-hazardous forms and forms stable non-combustible solid residues for final disposal.
Various categories of incinerators exist for the incineration of medical waste. Ranging from those that can burn less than 10kg per hour to those that can burn over 200kg per hour. They also operate at various temperatures ranging from 800 degrees Celsius to over 1500 degrees with various types of air pollution control systems. According to the UNEP toolkit for the identification and quantification of Dioxins and furans, the emission factor of the incineration of HCW ranges from 1 ug/t TEQ to 40,000 ug/t TEQ depending on the type of incinerator used. The lowest emissions are achieved when HCW is incinerated in the state of the earth incinerators with very good air pollution control system and highest emissions are from uncontrolled burning with no air pollution control system. Currently, all health care facilities in the Gambia practice uncontrolled burning except for MRC. Controlled burning with minimal or no air pollution control has an emission factor of 3000 ug/t TEQ. It can be seen that the use of an incinerator with a controlled temperature even without air pollution control is a significant improvement over uncontrolled combustion. Various types of incineration technologies exist with a wide range of costs.

In considering the most appropriate technology for the Gambia, the consultants considered the volume of HCW to be incinerated, the operation and maintenance costs of the system. RVTH generates the highest amount of HCW (less than 50kg/day), which is co-disposed with municipal waste. This poses a lot risks for HF workers, municipal workers, scavenger at the dumpsite, the general public and the impacts increase even more when it is burnt openly at the dumpsite. With an onsite incinerator it will take only one hour to incinerate 50kg of HCW and the emission from such small amount of waste is not as significant as the risks associated with the current disposal methods.

Although incineration provides substantial improvement over open burning, there are risks associated with incinerators, which can only be eliminated or minimized through careful planning, waste segregation, product selection, rigorous training and awareness creation.

A SWOT analysis was carried out by the consultant to compare the various options for the Management of HCW in the Gambia:
<table>
<thead>
<tr>
<th>SWOT</th>
<th>OPEN BURNING</th>
<th>INCINERATION</th>
<th>LANDFILL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strengths</td>
<td>Cheap way of reducing waste volumes,</td>
<td>More effective, reduced toxic emission, increased safety</td>
<td>Reduced/no toxic emission from burning,</td>
</tr>
<tr>
<td>Weakness</td>
<td>Emission of high levels of toxic gases, not environmentally acceptable, unsafe</td>
<td>Costs of incinerator and operating costs, requires training of personnel</td>
<td>Costs of creation of landfill, equipment and operation and maintenance.</td>
</tr>
<tr>
<td>Opportunities</td>
<td>Easy and no training or skills required</td>
<td>WHO installed De Monfort incinerators at the DHTs</td>
<td>Disposal of ash and other non hazardous wastes</td>
</tr>
<tr>
<td>Threats</td>
<td>Public reaction to the generation toxic fumes. Environmental laws and standards</td>
<td>Could be used for the disposal of PVC, mercury, which could result in high toxic emissions</td>
<td>Leachate generation, potential contamination of ground water</td>
</tr>
</tbody>
</table>

5.3 AUTOCLAVES

Autoclaving is a simple technology for sterilizing instruments and materials to be used in patient treatment, and for disinfecting lab instruments and wastes after use, and the technology has been familiar to health care professionals for over 100 years now. It is a simple straightforward technology, but used for only certain types of waste. The team found autoclaves in only a few HFs. However, disinfections using autoclaves or microwave technologies and then followed by controlled land filling is also expensive and there are no control landfills in The Gambia.

5.4 OTHER NON BURN TECHNIQUES

The trend internationally nowadays is towards non burn technologies such as high pressure shredders which use both high temperature and pressure to disinfect HCW and shred it into minute harmless material that can be land filled. Such machines are expensive and are not currently available in any HF in The Gambia.

The team recommended that the best option to treat HCW in The Gambia to improve the status quo is incineration. The various types of incinerators were evaluated based on practicability and sustainability.

Various options of incineration in terms of operation and maintenance were also evaluated.
1. Onsite incinerator for each HF
2. 6 Central incinerator one for each DHT
3. Eight (8) centralized incinerator one for each local administrative council

The team recommended option one (1) above as best practicable option for the Gambia. The main reasons include

- The transportation of HCW (Hazardous waste) requires specialized vehicles and packaging materials, which has to be available in a sustained manner. There are numerous risks associated with the movement of hazardous waste especially over long distances and bad roads.
- The costs of operation and maintenance of a special transport could be expensive.
- The consequences of system failure of a centralized incinerator will be very expensive in terms of cost and human health impacts.
- On site low cost incineration provides a safe and timely disposal of HCW.

WHO has constructed 6 De Montfort incinerators (Mark 8a) located at divisional health teams to incinerate sharps. Demon fort incinerator if properly operated has the following advantages:

(i) It can reach temperature of 800$^\circ$C or more.
(ii) Both capital and operational cost is low.
(iii) Operation and maintenance are simple.

Base on these advantages and the volume of HCW generated, the team recommended for Demon fort incinerator 8a for all minor health centers and type 9 for all major health centers and hospitals. Ash pit should be provided for each incinerator for the safe final disposal of residues. Similarly concrete lined pits should be built for safe burial of placenta at hospitals and major health centers.
6.0 HEALTH CARE WASTE MANAGEMENT PLAN
2005-2010

6.1 STRENGTHENING OF INSTITUTIONAL, LEGAL AND REGULATORY FRAMEWORK

There is currently no adequate legal framework for the management of HCW. The Environmental Management Discharge Permit Regulations 2001 requires all potential polluting processes, which include health care facilities to register with the NEA and are required to comply with discharge permits issued by the Agency. This permit is to monitor the management of waste from HF and ensure that it is done in an Environmental Sound Manner (ESM). However the enforcement of the regulation is weak due to the lack of adequate infrastructure (incinerator, land fills) for the environmental sound management of HCW. The enactment of the Draft waste Bill 2003 will strengthen the regulatory framework of HCW management. The Bill has provision for making regulations on special types of waste, which could be used to formulate a Regulation on the management of medical waste. A national HCW management policy and guidelines should also be developed to complement the above legislations.

6.2 IMPROVING THE CURRENT HEALTH CARE WASTE MANAGEMENT PRACTICES

To strengthen the health care waste management practices in the Gambia a comprehensive health care waste management plan is required not only at the national level but at the facility level to guide proper handling of the waste. The facility staff has to be trained to understand the plan and be familiar with it to ensure effective implementation. The first priority of an effective healthcare waste management plan is to comply with relevant national legislations and guidelines.

It has been observed that throughout the facilities visited expect for MRC there was no budget allocation for waste management. Since HCW management is an integral part of health care, it should be budgeted for and each HF should be aware of the costs that associated with the management and disposal of its waste. To improve the current practices each facility shall set up strategies to achieve the goals set out in their plan and develop policies and internal regulations that will guide them to successful implementation of the plan. It is recommended that each facility set up a waste management committee that will monitor and oversee the implementation of the healthcare waste management plan of the facility. The committee should include the head of the facility plus heads or representatives of all the distinct sections of the facility i.e. nurses, public health officers laboratory staff, orderlies, cleaners, doctors, technicians administrators etc. Every facility shall also designate or appoint a waste management officer who shall be in charge of ensuring the plan is implemented. He/She shall be the secretary of the Waste management committee, which shall be chaired by the head of the facility. The WMO shall supervise and coordinate the implementation of the plan.
In large hospitals such as RVTH, the WMO position could be a full-time job, but in small dispensaries like Brikamaba, one of the health officers could be designated as the waste management officer. However, such designation or appointment must be formal and include a detailed job description and terms of reference. The Waste Management Committee should meet at least once every quarter. The WMO officer should present a report of the waste management situation at each meeting, and the committee should make decisions on matters arising and commit funds if needed to address the issues raised by the WMO.

6.2.1 MINIMISING HEALTH CARE WASTE VOLUME

In order to minimize HCW volume in The Gambia, there should be policies and procedures in the following areas:

- Purchasing of medical items: This involves an analysis of what materials are purchased for use at a facility and identifying what packaging or specific items can be eliminated. It also involves analyzing hazardous materials that require special management and creating a specific risk to workers and the community and substituting them by less hazardous materials (e.g., mercury-based diagnostic technologies with non-mercury technologies).

- Donations of medical items: This entails enforcing the prior informed consent that is accepting only donations that the HF is informed of and approves prior to delivery. It also involves assessing the needs of the HF and accepting donations that address those needs.

- The use of disposable products: This involves a careful analysis of disposable products, which could be replaced by reusable ones.

6.2.2 HEALTH WASTE IDENTIFICATION, SEGREGATION AND PACKAGING

This involves an investment in training, signage, and containers and results in waste being sorted into appropriate secure containers, which determine treatment and disposal. When properly instituted, a HF can safely dispose of up to 90% of its waste as municipal solid waste. In particular, if safe and effective segregation of sharps occurs most of the hazards inherent in potentially infectious wastes generated in HF can be managed.

6.2.3 COLLECTION, TRANSPORTATION AND STORAGE

Once waste has been generated and collected, it needs to be transported from the point of generation to treatment and final disposal. To do this requires an investment in secure and easily movable transport containers, protective gears and training for workers, and larger storage containers. The key is keeping the wastes secure and isolated from point of generation to point of disposal so that contact with workers and the public is minimized.
**Personal Protective Gear:** Most workers in HF in The Gambia do not have Protective gear and Immunizations, a clear understanding of the principles of disease transmission or the basic steps they can take to protect themselves. To protect workers, health care facilities need to invest in training and education for workers, the purchase of personal protective gear and clothing for clinical and non-clinical staff that are likely to come into contact with potentially infectious or hazardous materials, and to make sure workers receive at least basic immunizations against tetanus or hepatitis.

6.3 TREATMENT AND DISPOSAL

It is important to clearly distinguish treatment from disposal. Especially in reference to incineration, this distinction is often lost. In reference to Healthcare waste, incineration is a treatment technology. It does not "dispose" of it. Rather in the process of sterilizing the waste, it reduces the volume and produces at least two additional wastes, which require attention. The first is particulates and other airborne emissions and residual ash from the combustion process, which in many cases must be treated as a special or hazardous waste. Final disposal always requires some form of land burial. Currently no sanitary landfills exist throughout the country. HCW is often indiscriminately dumped in unsecured dumpsites. Therefore ash pits are to be constructed with each incinerator.

6.4 STRENGTHENING INSTITUTIONAL CAPACITY

6.4.1 TRAINING AND CAPACITY BUILDING

Promotion of appropriation handling and disposal of HCW is important and every staff should have the right to informed about the potential health hazards. Training and awareness of staff will ensure prevention of exposure to health care waste and related health hazards and create awareness and foster responsibility among health staff of all cadres.

6.4.1.1 Initial Training

There are a number of health training institutions in the Gambia that supplies trained health workers for DOSH. They include

- The Gambia college-School of Public Health and The School of Registered Nurses
- The school of community health Nurse- Mansakonko
- The school of enrolled Nurse – Bansang
- The University of the Gambia- Faculty of Medicine and Allied Health Sciences.

The Public Health Department of the University of the Gambia and the College provide comprehensive training on public and environmental health. These two institutions unlike others run a full semester course on waste management with a component on hazardous waste.
The Schools of Public and Environmental Health at the University and the Gambia College have a comprehensive course on Waste Management that runs for a full semester or academic term. There is also a section (component of the Waste Management on hazardous waste. So far these are the two institutions that have an organized curriculum on Waste Management.

6.4.1.2. In-service Training.

To improve the quality of service in-service training is required. The Draft Human Resource for Health Policy envisaged the development of a well-coordinated in-service training.

Currently there is no organized in-service training curriculum and in-service training is organized adhoc. So far the NEA and DoSH had once organized in-service training on HCW MANAGEMENT in 2002 for Health workers, and municipalities.

6.4.1.3 Public Education and Awareness

There is no public education and awareness programme on HCW Management in the country.

The objective of Public Education on HCW includes:

- To prevent exposure to HCW and the associated Health Hazards.
- To inform the Public about risks associates HCW especially people who scavenge.

To increase awareness among patients, escorts and other visitors to HFs regarding hygiene and HCW Management. The team recommended the following methods for Public Awareness and Education:

- Poster exhibition on HCW issues including the dangers of scavenging discarded sharps and other HCW.
- Explanation by the staff to patients and their escorts on waste management policy or procedures within the HFs.
- Information poster exhibition in HFs at strategic points. Such posters should be simple and precise. All information on posters should be displayed in a manner that will attract people’s attention.

6.4.1.4. Training of Waste Handlers.

In all the facilities visited, orderlies and health labourers are entirely responsible of waste management. These people do not have any form of training on HCW MANAGEMENT and are least protected. The team recommends for training of waste handlers, which should include.
• Information on risks associated with handling of HCW.
• Procedures for dealing with emergencies/accidents including spillage.
• Instruction on the use of personal protective equipment.
• Procedures of handling/transporting HCW.

6.4.1.5 Training of HCW treatment plant operators/attendants

All HCW treatment plant operators should well trained to ensure that qualified operators are available. The training should address:

• Waste handling.
• Operation of the plant.
• Maintenance.
• Safe measures and emergency response.
• Administrative procedures.

HCW Training PROGRAM

To ensure that all healthcare facilities nationwide use a proper healthcare waste management system which entails

• Proper methods of medical waste segregation, collection, storage, treatment, transportation, and disposal
• Provision of adequate personal protective equipment and waste handling, storage and transportation equipment.
• Continual training and education on risks and hazards, proper procedures and methods
• Enforcing and monitoring compliance to health and safety procedures and precautions through establishment of an Infection Control/waste management committees including the designation of a Waste Management Officer in each health facility.

Target groups

• Relevant Policy Makers
• Private hospitals, clinics and practitioners
• Hospital Management Boards
• Infection Control Committee/Task Force
• Waste Management Officer
• Medical Staff and Administration
• Domestic Staff (orderlies, cleaners, etc.)
• Municipal staff

Besides the above-mentioned primary target groups to receive training, there must also be a general public sensitization on the risks of medical waste.
• Responsible role players

Policy makers
  □ Responsible for the formulation of laws and regulations, and for the mobilization of necessary resources from local and international collaborators and sponsors.

Specific authorities, NEA and DOSH
  □ Responsible for monitoring implementation and compliance with policy standards and guidelines.

Health care managers
  □ Responsible for supervising and enforcing the implementation and compliance with policy requirements, and for facilitating training in waste management.

Medical teaching institutions
  □ Responsible for developing a curriculum on waste management and for further research and development.

Waste management committees
  □ Responsible for the continuous education and training of all target groups, and for the enforcement and monitoring of proper waste management.

6.4.1.6 MONITORING AND EVALUATION

The infectious control/waste management Committee should be responsible for the evaluation and monitoring at the facility level.
This Committee’s should comprise of the following:

1. Officer in-charge
2. Heads of all other units /sections.
3. Chief /senior orderly.

The NEA in collaboration with DOSH (DHTs) are to be responsible for:

- Spot checking
- Registration of all health facilities
- Putting in place grading System to measure performance
PRE AND POST EXPOSURE / INJURY PROGRAMMES

- Immunization e.g. against rabies, tetanus, HBV etc.
- Periodic screening of staff
- Provision of protective gear
- Provision of adequate and appropriate equipment and materials for safety use and disposal
- Training on first aid and the provision of first aid materials
- Provision of retroviral drugs
- Timely reporting and documentation of all accidents and injuries
- Counseling

The Facilities should report to the DHTs and the DHTs should in-turn report to the national level.

METHODOLOGY

Workshops
- Lectures
- Discussions

On-the-job training

End-of-workday meetings/weekly meetings
- Review

Rewards and incentives
- Best ward/department
- Individuals/HW

Practical exercises
- Site visits
- Exchange visits
- Demonstration

Video shows
- Documentary films on medical waste segregation, storage and disposal
<table>
<thead>
<tr>
<th>Activities</th>
<th>Time frame</th>
<th>Persons Responsible</th>
<th>Resources</th>
<th>Expected outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Workshops</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policy makers (Sensitisation)</td>
<td>2 days</td>
<td>NEA/DOSH Officials</td>
<td>Transport - Venue - Per diem - Stationery - Food/refresh-ment.</td>
<td>Awareness of dangers - Release funds/attach Importance</td>
</tr>
<tr>
<td>Middle level staff</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper handling &amp; disposal of MW</td>
<td>5 days</td>
<td>TOT/DOSH/NEA</td>
<td>Honorarium - Venue - Stationery/teaching aids - Per diem - Food/refresh-ment.</td>
<td>Well informed middle level staff on MWM</td>
</tr>
<tr>
<td>- Collection</td>
<td>Every six months up to December 2010</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Storage</td>
<td></td>
<td></td>
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<tr>
<td>- Disposal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic staff (Gardeners, cleaners, municipal collectors, drivers, labourers, orderlies)</td>
<td>2 days per quarter</td>
<td>TOT</td>
<td>Documentary films - Posters - Transport - Per diem - Food/refresh-ment.</td>
<td>Safety precautions adhered to</td>
</tr>
<tr>
<td>Proper handling &amp; disposal of MW</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>- Collection</td>
<td></td>
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<tr>
<td>- Storage</td>
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<tr>
<td>- Disposal</td>
<td></td>
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<tr>
<td>2. On the job training</td>
<td>On-going (quarterly)</td>
<td>TOT</td>
<td>Video tapes - Transport - Posters - Stationery - Refreshment</td>
<td>Awareness creation on safe handling of MW</td>
</tr>
<tr>
<td>Health workers (Nurses, doctors, lab.technicians, theatre technicians) Mortuary staff</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Mortuary staff</td>
<td></td>
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<tr>
<td>Domestic staff (Gardeners, cleaners, municipal collectors, etc.)</td>
<td>On-going (bi-monthly)</td>
<td>TOT</td>
<td>Teaching Aid - Poster display - Site visit - Video tapes</td>
<td>Practical safe handling methods of MW</td>
</tr>
<tr>
<td>3. Monitoring and evaluation</td>
<td>On-going (every half year)</td>
<td>NEA/DOSH/infection control waste management committee</td>
<td>Transport (unannounced visits) - Stationery - Awards, incentives</td>
<td>Assess the progress of the training</td>
</tr>
<tr>
<td>4. Community sensitisation</td>
<td>On-going</td>
<td>Health journalists/NEA/DOSH/GRTS</td>
<td>Finance (cost of TV/radio spots - Editorials in local newspaper</td>
<td>Community Awareness creation on waste management in general</td>
</tr>
<tr>
<td>Dangers of poor waste management in general / IEC</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
6.5. STRATEGY FOR IMPLEMENTING THE HCW MANAGEMENT PLAN

THE NATIONAL ACTION PLAN

The National action plan is meant to give direction and momentum to the process of implementing the plan. It provides time bound targets for the completion of defined activities and identifies the parties responsible at each stage.
## Healthcare Waste Management Action Plan

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Activity</th>
<th>Year 0</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year Zero</td>
<td>Organize a one day national validation work shop of the proposed National HCW Management Plan</td>
<td></td>
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<tr>
<td></td>
<td>Set up a national Steering Committee for HCW Management Plan</td>
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<tr>
<td></td>
<td>Appoint of Project Coordinator to implement Health Care Waste Management plan</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>i Salary &amp; Allowances 12000</td>
<td>12000</td>
<td>12480</td>
<td>12979</td>
<td>13498</td>
<td>14038</td>
<td>14600</td>
</tr>
<tr>
<td></td>
<td>ii Office furniture &amp; Equipment 3000</td>
<td>3000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii Secretarial Services 1200</td>
<td>1200</td>
<td>1248</td>
<td>1298</td>
<td>1350</td>
<td>1404</td>
<td>1460</td>
</tr>
<tr>
<td></td>
<td>iv Other Costs</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Year One</td>
<td>Establish a Health Care Waste Management Committee in each facility</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Prepare Healthcare Waste Management Guidelines for all Healthcare Facilities</td>
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<tr>
<td></td>
<td>Review Healthcare Training Programmes to include waste management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4500</td>
</tr>
<tr>
<td>Year One to five</td>
<td>Organize sensitization workshops on HCW MANAGEMENT for Healthcare workers</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>i 10 workshops for 120 Healthcare workers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20000</td>
</tr>
</tbody>
</table>

Inflation 0.04
<table>
<thead>
<tr>
<th>Year one to five</th>
<th>Sensitization of the general populace on Healthcare Waste Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>i. Radio Airtime 3 spots a day @US2/spot</td>
</tr>
<tr>
<td></td>
<td>ii Television Airtime 1 spot a day @US30/spot</td>
</tr>
<tr>
<td></td>
<td>iii Highway bill boards 5 No @us1000/board/year</td>
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<tr>
<td></td>
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<tr>
<td></td>
<td>2190 2278 2369 2463 2562 2664</td>
</tr>
<tr>
<td></td>
<td>10950 11388 11844 12317 12810 13322</td>
</tr>
<tr>
<td></td>
<td>5000 5200 5408 5624 5849 6083</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Years one to five</th>
<th>Equip all Health care facilities with Waste Management Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

| Year Two          | Appoint Waste Management Officers in all Hospitals               |
|                   | Review Healthcare policies to include Waste Management Responsibilities |
|                   | TOTAL ANNUAL COST OF IMPLEMENTING HCW MANAGEMENT PLAN            |
|                   | 58840 32594 33897 35253 36663 38130                              |
6.6 COST ESTIMATES

The table 4.1 below indicates the total cost of equipment and the recurrent cost of implementing the plan for a 5-year period. In arriving at these costs the healthcare waste management needs of each and every health facility were evaluated and based on the current market prices and the existing inflation rate the initial acquisition cost of each of the items was estimated.

The plan per see is estimated to cost US$1,296,700 from inception to completion during the five-year period and US$324,200 for the first year of implementation.
SUMMARY OF COST ESTIMATES

<table>
<thead>
<tr>
<th></th>
<th>Year 0</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MATERIAL &amp; EQUIPMENT COSTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Costs</td>
<td>261,215</td>
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DETAILED COST ESTIMATES – MATERIAL & EQUIPMENT

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| Subtotal                  | 0      | 181748 | 188292 | 195098 | 202176 | 209538 |

| TOTAL ANNUAL COST         | 265,360 | 186,058 | 192,775 | 199,760 | 207,025 | 214,580 |
7.0 REFERENCES

Solid Waste Management Study for the Greater Banjul Area and Brikama (2003)

Bakoteh Dump Site Waste Management Study (October 2002).


Environmental Management Discharged Permit Regulations (2001)

National Environmental Management Act (1994)

The Public Health Act (1990)

The Public Health Policy

Internet (WHO web site and Demonfort University web site).
ANNEX 1 TERMS OF REFERENCE

TERMS OF REFERENCE FOR THE HEALTH CARE WASTE MANAGEMENT PLAN

Background and Introduction

The Government of the Gambia through credit number 3455-GM has received support from the International Bank for Reconstruction and Development (the World Bank) under its Multi-country AIDS Programme (MAP) to implement the Gambia HIV/AIDS Response Project (HARRP). The overall goal of the project is to prevent HIV and mitigate the impact of AIDS in the Gambia.

This HARRP is to assist the Government of The Gambia stem the rapid growth of human immuno-deficiency virus (HIV) infection, which causes the acquired immuno-deficiency syndrome (AIDS). The project will help organize a pre-emptive response to the growing HIV/AIDS epidemic through a multi-sectoral approach by: (a) maintaining the current low levels of the epidemic; (b) reducing its spread and mitigating its effects; and (c) increasing access to prevention services as well as care, and support for those infected and affected by HIV/AIDS. The overall project is premised on the development and expansion of local responses to the epidemic.

Component 1: Capacity Building and Policy Development - would aim at strengthening Gambia’s capacity to cope with the spread of HIV/AIDS by supporting: (i) the work of the multi-sectoral National HIV/AIDS Council (NAC) and the National HIV/AIDS Secretariat (NAS), the Divisional/Municipal HIV/AIDS Committees (DACs/MACs), and small entities requesting proposal preparation assistance; and (ii) the development of the national HIV/AIDS Strategy and Action Plan. Four sub-components address the following areas: (a) National Strategy and Action Plan; (b) HARRP Coordination and Administration, (c) Advocacy Training, and Technical Support Activities, and (d) Assessment, Monitoring and Evaluation (i.e. surveillance and mapping, operational research and pilot testing, and other monitoring and evaluation activities).

Component 2: Multi-sectoral Responses for HIV/AIDS Prevention, and Care - will improve the capacity of non-health sector line Departments to respond to the HIV/AIDS epidemic, emphasizing prevention and care through development of Departmental policies, coupled with a two-prong action approach, namely: (i) the provision to the line Department staff and their dependants of HIV/AIDS and STIs education, training, condoms, and other support, to encourage HIV/AIDS and STIs avoidance behavior; and (ii) the enhancement of the capacity of these staff to provide their partners and audiences (e.g. parents-teachers associations, farmers associations, village health committees, school boys and girls etc.) with means to provide effective HIV/AIDS and STI prevention, ways to access health care facilities and care. In due course municipalities will also prepare action plans for their personnel, and this would include the handling of hazardous waste and its disposal. Interested line Departments either have or will appoint HIV/AIDS focal persons to carry out Departmental
policies action plans, with support from HARRP in terms of facilities, equipment, and incremental operating costs.

**Component 3: Health Sector Responses to STI/HIV Management** - makes provision for prevention and care from a health sector perspective, whether public or private. It provides the resources to the health sector to build on the framework of the STI and HIV/AIDS management manuals recently adopted by the DOSH, as well as other reproductive health and communicable disease activities currently performed by the DOSH and its health sector partners. Under this component, the DOSH will be able to do the activities described above for other line Departments (HIV/AIDS and STI avoidance behavior by its staff and dependants and reaching external target groups). Based on the model already in place in one health facility, reproductive health centers will be installed in each of the Divisions, with trained staff. In addition DOSH can enhance its reproductive health and opportunistic infections efforts with funds provided herein, recognizing it will not be able to undertake all health sector specific tasks at once, nor do it without assistance from other non-public health care providers. Using the experience and capacity of the PHPNP, the procurement of condoms, opportunistic infection drugs, gloves and other medical supplies, testing kits, and limited laboratory equipment is envisioned.

**Component 4: Community and Civil Society Initiatives** - will be a financing mechanism to provide grant resources to support community, civil society, worker associations, and "establishment or primary unit" initiatives ("establishments or primary units" are businesses, military camps, prisons, refugee camps, religious groups, trade associations, sports clubs and the like). This component will therefore support both "community-based" and "community-involved" activities. Applications to the Community and Civil Society Initiatives (CCSI) can be submitted to the DACs/MACs directly by a community or community association, a private entity, or by collaborators (NGOs, consortiums) on their behalf. An NGO or other organization can consolidate a number of smaller proposals to create a medium sized proposal, and submit it to the DAC/MAC. In addition, any national, multi-Divisional, or divisional concept/program benefiting communities which are a priori not identifiable, may be approved for funding under this component, provided the concept/program meets CCSI’s pre-established eligibility criteria. Qualified applicants will be able to obtain modest grant assistance from the HARRP for local consultant support to help in preparing proposals and organizational training, if need be. Project proposals will be considered based on an HIV/AIDS Activity Positive List which will be further defined in an IDA-approved, Community and Civil Society Initiatives Operations Manual. All larger projects will be submitted to the NAS for rapid appraisal and approval.
Objective:

The handling, collection, disposal and management of HIV/AIDS infected materials are the most significant environmental issue in this program. In light of its importance to contributing to the spread of the disease, a Medical Waste Management Plan appropriately costed with clear institutional arrangements for its execution is required. The inappropriate handling of HIV/AIDS infected materials constitute a risk not only for the staff in hospitals and in municipalities who are involved in waste handling, but also for families and street children who scavenge on dump sites. Some aspects of project implementation for example the establishment of testing clinics, the purchasing of equipment by communities for home care of the sick etc. could constitute an increase in the environmental and health risk with regard to the handling of HIV/AIDS infected wastes.

The objective of the study is to identify the level of Health Care Waste Management that will be relevant to help implement and enforce proper health and environmentally sound, technically feasible, economically viable, and socially acceptable systems for management of health care waste in the Gambia.

The examination of the of the current practices with regard to the handling of hospital waste will verify both the management of waste within the hospitals, clinics and other health centers as well as the management by municipal authorities once the waste has left the source. It will also look into the level of knowledge among staff (hospital orderlies, nurses, patients, municipal workers etc.) about the practices to be adopted, and into the availability of equipment such as incinerators to deal with this type of wastes.

Scope of the Study

Work shall be carried out according to the following tasks:

Task I

Assess the Policy, Legal and Administrative Framework as well as the Regulatory Framework on health care waste management and treatment/destruction facility in the country including air emission standards which are currently required by law and which would likely be required in the next say ten years.

Identify permit requirements, including environmental building, and other permits and procedures that health care waste treatment/destruction facilities would need to address.

Outline any public participation or public hearing requirements and procedures. For each requirement, list the lead agency to be contacted.
Assess the typical time demands for proposed facilities to obtain permits and address environmental impact requirements and public participation requirements.

Identify all healthcare facilities in the country and include basic information for each facility, such as number of beds, bed occupancy rate, and specialists, divided into categories.

Assess the health care waste generation at (i) one major hospital (ii) one regional hospital (iii) one health center (iv) one private clinic. The details should include the minimum weigh of total generated at each health care facility per week. Composition of the waste should be determined through segregation at the waste end point, extrapolate the results to cover the entire country.

Assess the level of scavenging, if any, or recycling taking place inside health care facilities; along transportation routes, and at final disposal sites. Determine social issues in relation to scavenging taking place.

Review and analyze existing health care waste storage, collection and disposal systems with due regard for level of separation, the frequency of collection; and environmental and health impacts for existing treatment.

**Task II**

**Determination of Technology and sitting Facility;**

For the types and quantities of health care waste generated in the study area, assess alternative technologies and facility sizes for treatment and destruction. The assessment shall compare the alternatives on the basis of capital cost, operating cost, ease of operation, local availability of spare parts, local availability of operational skills, demonstrated reliability, durability, and environmental impact. The technologies to be considered include: safe land filling, incineration, sterilization (Autoclave and Microwave) and Chemical disinfections. On the basis of this assessment, recommend a process flow for economic and environmentally sound treatment and final disposal of health care waste leading to selection of appropriate technology. The final decision on choice should be made by the Government and /or facility.

**Determination of Disposal Sites.**

If site for disposal exists, collect all existing plans of suitable sites to be considered for the locations of the treatment facility (ies) and review general transport and traffic systems relative to appropriate sites.
Consider (a) accessibility to the site, (b) distance from health care facilities to the site; (c) distance to sensitive areas; (d) future development plans of the area; (e) possibility to acquire the area (f) cultural and historical sites ;(g) Public opinion ; (h) noise and dust impact to nearby areas

Public consultation /hearing must be held as part of the final assessment for siting of the treatment facility.

**Analysis of site .**

Analyze the above information to determine whether there is sufficient appropriate material on site for daily and final cover, whether the site soil, hydrological and geo-hydrological conditions would ensure adequate protection of any ground and surface water used for drinking and/or irrigation. If the sites prove to be unsuitable, inform the client stating the reasons.

**Financing**

The National Government or local government, potentially in conjunction with other municipal solid waste treatment and disposal activities, may finance a regional facility. An alternative approach is for the private sector to provide the health care waste treatment and disposal activities or waste transport for the entire region.

Assess private sector participation as service provider;

Assess public -private partnerships and cost recovery at the regional, municipal level, based on the polluter pays principle, where each health care facility pays according to the volume of waste generated.

**Task III**

Review existing training and public awareness programs on health care waste management at hospitals and other health care establishments and prepare a training need assessment.

Working in conjunction with the relevant government institutions and Municipal councils, prepare a costed training program and a well targeted Awareness Building Campaign Program including the general public, and more specifically health care workers, municipal workers, dump site managers, incinerator operators (if that is the choice of technology), nurses, scavengers/pickers families and street children. The design of the material required for the awareness building programs should be discussed with the relevant authorities and the general public to ensure that their concerns that are deemed appropriate are incorporated in the design of the program, sitting layouts, mitigation measures and community communication programs. The Training and Awareness Building Program and the Management Program shall be appropriately costed and the Plan shall be presented in a National Workshop.
Output and Reporting

Present and discuss a full draft report with the project authorities and the proponent, and focus on the significant environmental and human health issues in a format similar to the following:

Executive Summary
Policy, Legal and Administrative Framework
Project Description
Baseline Data
Assessment of Healthcare waste
Healthcare waste Training Needs Assessment
Determination of Technology
Determination of Disposal Sites
Management and Training for Institutions and Agencies
Monitoring Plan
Appendices
-- List people consulted
-- References
-- Record of Inter-agency / forum/ consultation meetings

Task IV Final Report

Revise the draft report in accordance with the comments of the World Bank, the Government and other interested parties and submit the Final Report incorporating all changes and modifications required to the Project Task Team.

Study Supervision and Time Schedule

The work of the consultant would be supervised by the relevant government institution(s) responsible for the project. The Agency will coordinate with all other governmental agencies, ministries and other donors working in the sector.

The Consultant(s) shall begin work no later than (21) days after the date of the effectiveness of the contract. It is anticipated that the Consultant would complete the outputs of the work over a maximum duration of 6 weeks with four weeks in the field for data collection and collation and two weeks of report writing and finalization of the document after the review has been carried out.

The consultant should propose a clear schedule with critical milestones, and makes all possible efforts to complete the work at the appointed time.

The consultant should have the technical competence in scientific, health, environmental and engineering fields in particular sanitary engineering. He/She may also have competence in the private sector participation field and skills in training and institutional strengthening. The Consultant is expected to provide 6-8 well bound reports with pictures and maps where necessary to the Government and the Bank.
### ANNEX 2 ESTIMATE OF EQUIPMENT & MATERIAL REQUIREMENTS

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*FANTAMADI ASSOCIATES*

22/02/2006
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## NORTH BANK DIVISION

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**FANTAMADI ASSOCIATES**

22/02/2006
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**CENTRAL RIVER DIVISION**
### SUMMARY OF TOTAL MATERIAL & EQUIPMENT REQUIREMENT

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ANNEX 3 STAKEHOLDER CONSULTATIONS

INFORMATION LETTER
National HIV/AIDS Secretariat (NAS)
The Gambia HIV/AIDS Rapid Response Project (HARRP)
7 Clarkson Street, Banjul
Tel: 223263    Fax: 223246

NAS/PLD/056/2005/WM/(001)    1ST June 2005

TO ALL ADDRESSES
Detail assessment of Representative Health facilities for the design of a Medical Waste Management Plan For The Gambia

The government of the Gambia has received support from the International Bank For Reconstruction and Development to implement the HIV/AIDS Response Project with the aim of preventing and mitigating the impact of HIV/AIDS in the Gambia.

Cognizant of its implications, the handling, collection, disposal and management of HIV/AIDS infected materials are the most significant environmental issue in the project. The inappropriate handling of HIV/AIDS infected materials constitute a risk not only for the staff in the hospitals and in municipalities who are involved in waste handling but also for families and street children who scavenge on dump sites. In light of its importance to contributing to the spread of the disease, Medical Waste Management Plan appropriately coated with clear institutional arrangements for its execution is required.

The objective of the study is to identify the level of Health Care Waste Management that will be relevant to help implement and enforce proper health and environmentally sound, technically feasible, economically viable, and socially acceptable system for management of health care waste in the Gambia.

The examination of the current practices with regard to the handling of hospital waste will verify both the management of waste within the hospitals, clinics and health centers as well as the management by municipal authorities once the waste has left the source. The study will also look into the level of knowledge among staff (hospital orderlies, nurses, patients, municipal workers etc) about the practices to be adopted and into the availability of equipment such as incinerators to deal with this type of waste.
In light of the above, the secretariat (NAS) has engaged the services of a consultant (SAIKOU NJAI and his team) to develop a Medical Waste Management plan for the Gambia. The consultant needs to make detailed assessment of representative health facilities in the country and your health facility has been chosen as one of the representative health facilities to be assessed. The assessment will be conducted for a period of one week (seven days).

As a major stakeholder in the management of medical waste, we solicit your support and cooperation in the study. The consultants will be coming to meet you soon to discuss details on how the assessment will be done.

Yours sincerely

Ndrey Jarra
For: Director

**ADDRESSES**

Director of Health Services - DOSH
The Quadrangle
Banjul

Chief Executive - Banjul
RVTH

The In charge
Basse Health center - Basse, URD

The In charge
Sukuta Health center - Sukuta,

Chief Executive
AFPRC Hospital Farafenni - Farafenni, NBD

The In charge
Brikama Ba Health center - Brikama Ba, CRD

Managing Director
Jobot laboratories - Kairaba Avenue, KMC

Managing Director
Banjul pharmacy Banjul - Banjul

Director
Bremen Clinics - London Corner, Serrekunda
## Summary of consultation meetings

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<th>KEY CONCERN/COMMENTS</th>
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<td>7th June 2005</td>
<td>DIVISIONAL HEALTH TEAM (DHT) NORTH BANK WEST – PERSONNEL MET:</td>
<td>1. Additional incinerator attendant should be available for the demo fort Incinerator.</td>
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<tr>
<td></td>
<td>Baba Njie - Divisional Public Health Nurse (DPHN)</td>
<td>2. Transport constraints is deterring some facility from bringing their sharp boxes to the incinerator.</td>
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<td>Sanjally Trawalleh - Senior Administrator</td>
<td>3. Training/retraining of health staff on MWM is recommended.</td>
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<td></td>
<td>Fatou Camara - SCHW Tutor</td>
<td>4. Waste segregation is weak and only limited to sharps.</td>
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<tr>
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<td>Babucarr Choye - DPHO</td>
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<tr>
<td>8th June 2005</td>
<td>DIVISIONAL HEALTH TEAM (DHT) NORTH BANK EAST – PERSONNEL MET</td>
<td>1. General MWM is not desirable.</td>
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<td>Baba Jeng – DPHN</td>
<td>2. Incinerator has been made available for sharps.</td>
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<td>Jankoba Jabby – Senior Administrator</td>
<td>3. Incinerator should be provided for other medical wastes.</td>
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<td>Muhamad Saho – APHO</td>
<td>4. Central incinerator should be built.</td>
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<td>Baba Manjang – Vector Control Officer</td>
<td>5. Proper storage facilities and collection equipment should be provided.</td>
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<td>Sulayman Manneh – CHW tutor</td>
<td>6. There should be a transport for collection of MW from facilities to central incinerator.</td>
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<td>7. Each DHT should have HCW MANAGEMENT officer.</td>
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<td>8. Health staff should be trained on HCW</td>
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<td>Date</td>
<td>Location</td>
<td>Key Concern/Comments</td>
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<td>AFPRC Hospital</td>
<td>📌 Proper waste management equipment should be available.</td>
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<td>Omar Sey – CEO</td>
<td>📌 Protective equipment should be provided for orderlies.</td>
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<td>PNO, PRO</td>
<td>📌 The waste management team and the rest of staff should be trained.</td>
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<td>📌 On site incinerator should be provided for the hospital.</td>
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<td>10th June 2005</td>
<td>DIVISIONAL HEALTH</td>
<td>📌 Proper collection and storage facilities should be available.</td>
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<td>TEAM (DHT) CENTRAL RIVER</td>
<td>📌 Special transport should be provided for MW collection from facilities.</td>
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<td>DIVISION – Baba Balajo – DHO</td>
<td>📌 Two regional incinerator should be available one from North Bank and the other from the South Bank.</td>
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<tr>
<td></td>
<td>Babucarr Jammeh – DPHN</td>
<td>📌 Training and retraining of Health workers on MWM.</td>
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<tr>
<td></td>
<td>Momodou Lamin Manneh – DPHO</td>
<td>📌 MWM officer should be designated in each DHTR.</td>
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<td>Sheriff Jammeh – SCHW tutor</td>
<td>📌 Provide protective equipment for MW workers.</td>
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<td>10th June 2005</td>
<td>DIVISIONAL HEALTH</td>
<td>📌 MWM is still unsatisfactory.</td>
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<td>TEAM (DHT) CENTRAL RIVER</td>
<td>📌 Health facilities find it difficult to ........ their sharp boxes due to transport.</td>
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<td>DIVISION – Sana Jawara – DHO</td>
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<td>Amadou Woury Jallow – DPHO</td>
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<tr>
<td>Date</td>
<td>Key Concern/Comments</td>
<td>Key Concern/Comments</td>
</tr>
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<td>------------</td>
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</tr>
<tr>
<td>June 2005</td>
<td>① Attitude of staff towards segregation of sharps from other waste needs to be improved, sharps could still be seen in dustbins or on ground despite the provision of sharp boxes. ② Unsecured storage/burning area in facilities that practice such. ③ Two regional incinerators should be for CRD, one North and one South. ④ Ash pit far from the demon fort.</td>
<td>BANSANG HOSPITAL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dampha – CEO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jammeh – Head of</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>Maintenance</td>
</tr>
<tr>
<td>11th June</td>
<td>① The current MWM is unsatisfactory. ② A big incinerator is required. ③ More waste collection and storage facilities needs to be provided.</td>
<td>DIVISIONAL HEALTH</td>
</tr>
<tr>
<td></td>
<td>TEAM (DHT) LOWER RIVER DIVISION – T</td>
<td>Bafoday Jawara – DHO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saihonna Sanyang -</td>
</tr>
<tr>
<td></td>
<td>DPHO</td>
<td>DPHO</td>
</tr>
<tr>
<td>16th June</td>
<td>① A demon fort incinerator is available at DHT. ② Transportation of sharp boxes from basic facility is irregular. ③ There is inadequate waste collection/storage receptacles in health/facilities. ④ Some facilities use cartons for waste storage. ⑤ Proper waste collection equipment should be available. ⑥ On site incinerator is preferred where this is not possible central incinerator should be provided. To provide a central incinerator the following should be considered.  • A proper transport.  • Proper waste collection equipment.  • Storage facilities at health centre.  • A designated officer.</td>
<td>World Health</td>
</tr>
<tr>
<td></td>
<td>Organisation Country Office The Gambia</td>
<td>Kebba Jobe – EPI Officer</td>
</tr>
<tr>
<td></td>
<td>The development of a HCW MANAGEMENT plan</td>
<td></td>
</tr>
<tr>
<td>16\textsuperscript{th} June 2005</td>
<td><strong>BANJUL CITY COUNCIL</strong></td>
<td><strong>KEY CONCERN/COMMENTS</strong></td>
</tr>
<tr>
<td>-------------------------------</td>
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<td>--------------------------</td>
</tr>
<tr>
<td>Mustapha Jallow</td>
<td></td>
<td>1. MWM is unsatisfactory.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Health facilities should have proper MW disposal facilities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. The Mile 2 Dump site is not secured and properly managed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. BCC waste collectors are not protected and lack training on MWM.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Legislation on MWM is weak.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Councils can run regional incinerators if trained.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>27\textsuperscript{th} June 2005</th>
<th><strong>ROYAL VICTORIA TEACHING HOSPITAL – PERSONNEL MET</strong></th>
<th><strong>KEY CONCERN/COMMENTS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>PNO</td>
<td></td>
<td>1. No policy is available on waste generation and segregation in the facility.</td>
</tr>
<tr>
<td>Heads of Units</td>
<td></td>
<td>2. Second hand materials and other philanthropist gifts should be assessed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. There should be a list of essential materials required to control over flow of the hospitals with unwanted items including short lived drugs. A prior information consent should be put in place.</td>
</tr>
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<td>4. Number of patient of escorts should be controlled to minimize waste generation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Unnecessary usage of disposable materials should be controlled.</td>
</tr>
</tbody>
</table>

is long over due.

1. WHO Country 6 demon fort incinerators at each DHT (March 15-20 2004) to incinerator ICPJ injection equipment and related materials.

2. Incineration is a better option for MW compared to land filling interns of both capital and operational cost including maintenance.

3. For a regional incinerator proper waste management waste equipment/facilities should be provided. Trained personnel should be available and supervised.

4. There is should also be regular monitoring.

5.
<table>
<thead>
<tr>
<th>Date</th>
<th>Department / Role</th>
<th>Key Concern/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>23rd June 2005</td>
<td><strong>DEPARTMENT OF STATE FOR HEALTH – DOSH</strong></td>
<td>- A contact policy should be available to control construction waste.</td>
</tr>
<tr>
<td></td>
<td><strong>Dr. Tamsir Mbowe – SOS</strong></td>
<td>- Rational usage of drugs should be encouraged.</td>
</tr>
<tr>
<td></td>
<td><strong>Joseph Jassey – Permanent Secretary</strong></td>
<td>- Frequency of waste collection by council is poor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Irregular supply of equipment to segregation waste is a major constraint.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Inadequate waste management equipment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lack of proper on site means of transporting waste.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The infection control unit should be strengthened.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Induction programme should in corporate WM.</td>
</tr>
<tr>
<td>23rd June 2005</td>
<td><strong>DEPARTMENT OF STATE FOR HEALTH – DOSH.</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Samba Conteh - PPHO</strong></td>
<td>- The SOS and PS of DOHS were met and expressed concern on the need to improve HCW MANAGEMENT.</td>
</tr>
<tr>
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<tr>
<td></td>
<td></td>
<td>- Each major health facilities should be provided with an incinerator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Minor Health Centre can transport their HCW to these incinerators at major Health Centres.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Waste segregation should be practiced.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- To provide a regional incinerator the following must be put in place:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Proper transport.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Operation / cost.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Appropriate collection equipment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Storage facilities at all Health Centres.</td>
</tr>
<tr>
<td>Date</td>
<td>Organization</td>
<td>Comments</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 21st June 2005 | DHT WESTERN - Karamba Keita - DPHO | 1. Waste Management is entirely left with the hands of orderlies who are untrained.  
2. Transport should be provided for centralize incinerators and DHTs can be mandated for its operation.  
3. Special waste collection and storage equipment/facilities should be provided.  
4. Training and retraining should be conducted for health workers. |
| 4th July 2005 | National Environment Agency - MOMODOU B SARR Executive Director | 1. Dangers/risks associated with the transportation of hazardous waste  
2. The need for very health facility to be responsible for its waste  
3. The emission levels of dioxins furans compared with infections from exposure to HVCW  
4. Costs of special vehicle and packaging equipment for safe transportation of HCW |
ANNEX 4 ASSESSMENT FORMS AND QUESTIONNAIRES

National HIV/AIDS Secretariat (NAS)
The Gambia HIV/AIDS Rapid Response Project (HARRP)
7 Clarkson Street, Banjul
Tel: 223263 Fax: 223246

Assessment of Health facilities for the design of a Medical Waste Management Plan
For The Gambia

Name of facility:..............................................................................................................................

Government/Private/NGO:...........................................................................................................

Head/Owner/in charge:....................................................................................................................

Number of Beds:............................................................................................................................

Number of patients served/month/day/year:..................................................................................

(a) Out of patient:...........................................................................................................................

(b) Admissions:...............................................................................................................................  

Total average amount of waste generated/day/month/year:......................................................

Is the waste segregated?

Waste management equipment available:....................................................................................

Number of staff directly involved in Waste management:...........................................................
Method of waste disposal:…………………………………………………………………………………
………………………………………………………………………………………………………………
What is the opinion of the facility staff on the current method of waste management?
………………………………………………………………………………………………………………
………………………………………………………………………………………………………………
Waste disposal facilities:…………………………………………………………………………………..

Any reported cases of injury from medical waste (sharps)?
………………………………………………………………………………………………………………
Is there an incinerator at the facility?
………………………………………………………………………………………………………………
How is it operated?
………………………………………………………………………………………………………………
Is it adequately incinerating all the waste at the facility?
………………………………………………………………………………………………………………
How can waste management at the facility be improved?
………………………………………………………………………………………………………………
………………………………………………………………………………………………………………
………………………………………………………………………………………………………………
NAME OF HEALTH FACILITY

Date

MEDICAL WASTE GENERATION MONITORING

WARD/UNIT/Department

<table>
<thead>
<tr>
<th>WASTE CATEGORY</th>
<th>MON</th>
<th>TUES</th>
<th>WED</th>
<th>THURS</th>
<th>FRI</th>
<th>SAT</th>
<th>SUN</th>
<th>MON</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHARPS</td>
<td></td>
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<tr>
<td>INFECTIOUS</td>
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<tr>
<td>PATHOLOGICAL</td>
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<tr>
<td>RADIOACTIVE</td>
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<tr>
<td>CHEMICAL</td>
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<tr>
<td>PHARMACEUTICAL</td>
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<tr>
<td>GENERAL</td>
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<td></td>
</tr>
<tr>
<td>OUTPATIENT</td>
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<td></td>
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<tr>
<td>INPATIENT</td>
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<td>TOTAL</td>
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</table>
ANNEX 5 SYNTHESIS OF THE FIELD VISIT

The team embarked on a week field visit in order to rapidly assess HCW MANAGEMENT situation in health facilities. To accomplish this mission, a questionnaire was used to collect data through focus group discussion with key staff of the health facilities in particular officers in charge. In addition, the team also observed HCW management methods of the facility including inspection of disposal sites.

Type of health facilities visited.

A total of fifty six (56) health facility were visited with thirty-two (32) of them situated in the rural part of the country. Thirty nine (39) of the health facilities visited are government facilities, three (3) are Medical Research Institutions (MRC), one (1) community owned and eleven (11) Private / NGO.

A number of village clinics were also visited and detail of others were obtained from DHTs in whose area they operate.

Bed capacity and patient Activity

The volume of HCW generation depends on a number of factors. Bed capacity and patient activity (inpatient /out patient) are significant determinants of volume of HCW generation. The team reviewed patient’s registers for some facilities in order to determine average number of inpatient and out patients for a period. One problem observed in most HF was the incompleteness of information in a number of public health facilities registers reviewed.

Consequently, calculations of bed occupancy (admission) and out patient was based on estimate given by health facility.

A Bed capacity

The cumulative total of beds at health facilities visited is one thousand seven hundred and eighty one (1781) beds.

Table shows break down of beds by type of health facility

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>1558</td>
</tr>
<tr>
<td>NGO/Private</td>
<td>207</td>
</tr>
<tr>
<td>Community owned</td>
<td>16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1781</strong></td>
</tr>
</tbody>
</table>
From the table, government facilities have the highest bed capacity by extension they can be assumed to be the major source of principal producers of HCW.

**BED Occupancy/ admissions (inpatient)**

Average bed occupancy was estimated by asking how many patients are admitted in a day/week/month. On average, admission ranges from 1-5 daily depending on the season. Current admissions can double during Malaria season during which beds are full to capacity with two to three children admitted on a bed.

**Out patient**

Similar question under inpatient was also asked for out patient. On average, number of patients currently seen at out patient range between 20 – 100. Like inpatient, out patient figures fluctuate depending on the season with more cases during rains.

It should be noted that these calculations are based on estimates given by health facilities. The detail assessment of representative health facilities provides more accurate information on inpatient and out patient as they are monitored to ensure completeness during the study period.

**Estimation of HCW generated**

Except for RVTH, no attempt has so far been made to quantify HCW generation in all the health facilities visited. The Infection Control Unit of RVTH in early 2005 made an attempt to quantify the volume HCW and the result indicated a total 161kg of HCW generated per week.

Lack of data on volume of HCW has made it difficult to quantify HCW generated by Health facilities visited. None the less the production of HCW was estimated using sharps as the only type of HCW segregated in all the health facilities visited. A full safety box made out of cartons and supplied by WHO/UNICEF for safe disposal of EPI injections materials was weighed, the weight of which is 1.9 kg. Assuming that the weigh of a full sharp box is 2kg the number of sharp boxes generated for a period is multiplied by this weight (2kg) to obtain the total volume of sharps. Base on this method, on average, approximately 2-4kg (1-2 full of the WHO/UNICEF sharp boxes) of needles and syringes is generated daily with MCH Clinics (immunisation services) inclusive.

As discussed under appraisal of current situation final waste disposal of health facilities is unsatisfactory. Out of the health facilities visited only seven (7) have onsite incinerators (4 of them located in public health facilities and 3 in MRC Stations)

Even though the public health sector remains the principal provider of health care services and over the years witnessed rapid infrastructural expansion, such development programs did not make provision for management of HCW.
Reported cases of injury due to HCW

A question on whether there has ever been reported case of injury due to HCW was asked to establish the cause and the category.

The frequently reported cases of injury are needle pricking during injections and handling/disposal of HCW. The most commonly affected category of staff are the orderlies. A yes answer to the question was probed further to ascertain what action has been taken following a reported case of injury. No major/formal action is taken. However some facilities reported of reassuring the victim.

Staff directly involved/responsible for organisation and management waste collection, storage and disposal of HCW at facility

A total two hundred and sixty three (263) people are directly responsible for the organisation and management of HCW. They are mainly orderlies and health labourers, supervised by public health officers and officer in charge of health facilities. The few that the team spoke to reported of not been trained on HCW and not protected. There is no job description outlining their tasks. The team observed that in a number of facilities the orderlies were found using surgical gloves as protective gear while working.

Waste management equipment and disposal facilities

For a proper HCW MANAGEMENT to exist, appropriate infrastructure and equipment must be provided. The current undesirable HCW MANAGEMENT in health facilities in particular disposal methods can be partly attributed to lack of appropriate infrastructure and waste management equipment. There is a serious shortage of waste collection equipment in all health facilities particularly in public health facilities and in fact lacking in a number health facilities. In such instances empty cartons plus other forms of improvised containers without lids were found in use.

In addition to the many associated risks, scavenging by children and animals has been expressed by health staffs as a concern. No budget line exists or if so very minimal to invest in to waste management of health facilities.

An inventory of HCW MANAGEMENT equipment indicated limited waste management equipments with 1-2 Wheel barrows for transporting of HCW, few rakes, brooms (hard/ soft). However adequate sharp containers exist in all the public health facilities. No colour coding and lining of dust bins is practiced in all the health facilities visited except for MRC.

**Inventory of waste management equipment of 38 health facilities.**

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
</tr>
</thead>
</table>

**FANTAMADI ASSOCIATES**

22/02/2006
Wheelbarrow 39
Dustbins 125
Rakes 44
Cutlasses 34
Spades 10
Brooms 12
Donkey cart 1

Awareness level and training of staff

The level of awareness and training on HCW management are important factors in changing and improving HCW MANAGEMENT. A number of qualitative question were asked during the field visits to assess awareness level of health workers and training need. One of these question relate to the opinion/comments of staff about the current HCW MANAGEMENT of the facility

Comments/Opinion

<table>
<thead>
<tr>
<th>Category of Health Facilities</th>
<th>Good</th>
<th>Fair</th>
<th>Unsatisfactory (Poor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Health facilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Hospitals</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>ii) Basic Health Facilities</td>
<td>2</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>NGO/Private</td>
<td>4</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Community Owned</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>3</td>
<td>36</td>
</tr>
</tbody>
</table>

Thirty six of the health facilities admitted that their current HCW MANAGEMENT is unsatisfactory (poor) suggestive of some degree of awareness. The highly expressed reason for unsatisfactory is smoke pollution and may be a source of infection to scavenging children.

Generally, awareness on dangers of sharp in terms of diseases transmission particularly HIV/AIDS is high. However awareness on dangers of other medical waste is low.

None of the health staff beside basic training on waste management at initial training institutions have training on HCW MANAGEMENT. This affects even the DHTs who are the immediate supervisors of the secondary level of health care delivery. In-service training on HCW MANAGEMENT is completely absent.

In conclusion the need for training on HCW MANAGEMENT has been strongly expressed as a concern. Onsite incinerators and appropriate waste management equipment were also recommended.
ANNEX 6  LIST OF HEALTH FACILITIES VISITED

1. Sibanor Health Centre
2. Gunjur Health Centre
3. Kartong Health Centre
4. Sanyang Health Centre
5. Brufut Health Center
6. Sulayman junking General Hospital
7. Kaur Health Center
8. Chamen Health Center
9. Garawol Health Center
10. Fatoto Health Center
11. AFPRC Hospital Farafenni
12. Sra Kunda health Center
13. Njaba Kunda Health Center
14. Illaisa Health Center
15. Salikenni Health Center
16. Kerewan Health Center
17. Essau Health Center
18. Kerr Cherno Health Center
19. Kuntair Health Center
20. Ndungu kebeh Health Center
21. MRC Farafenni
22. Ngen sanjal Health Center
23. Basse MRC
24. Karantaba (Sami) Health Center
25. Karantaba (Kiang) Health Center
26. Kwinella Health Center
27. Soma Health Center
28. Bureng Health Centre
29. Janjanbureh Health Centre
30. Saint Lazardus clinic (Fula Batang)
31. Gambisara Health centre
32. Brikamaba Health centre
33. Yorobawol Health Centre
34. Baja Kunda health Centre
35. Basse Health Centre
36. Diabugu Health centre
37. Jahally Health Centre
38. Kudang Health centre
39. Dankuku Health Centre
40. SOS Clinic
41. Bakau Health Centre
42. Brikama Health Centre
43. Jabot laboratory
44. Serrekunda Health Centre
45. Lamtoro Clinic
46. Leman street Clinic
47. RVTH
48. MRC – Bakau  
49. Lamin Health centre  
50. Banjulinding Health Centre  
51. Faji Kunda Health centre  
52. Banjul pharmacy  
53. Bremen clinic  
54. Ahmadiya Hospital  
55. Bansang Hospital  
56. Medina Seringe Mass Village Clinic