Improved Child Survival Program for Human Capital MPA

Healthcare Waste Management Plan (HCWMP) – Draft Final
# ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ANC</td>
<td>Ante Natal Care</td>
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<tr>
<td>CWM</td>
<td>Construction Waste Management</td>
</tr>
<tr>
<td>EA</td>
<td>Environmental Assessment</td>
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<tr>
<td>EAR</td>
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<td>ESIA</td>
<td>Environmental and Social Impact Assessment</td>
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<tr>
<td>ESMF</td>
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<td>FEPA</td>
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<td>FGoN</td>
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<td>GRS</td>
<td>Grievance Redress Service</td>
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<tr>
<td>GRM</td>
<td>Grievance Redress Mechanism</td>
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<td>HAI</td>
<td>Hospital Acquired Infection</td>
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<td>HCF</td>
<td>Healthcare Facility</td>
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<td>IDA</td>
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<td>LFN</td>
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<td>LGA</td>
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Executive Summary

ES 1: Introduction and Background
Nigeria is one of the largest economies in Africa but has in recent years faced a recession which saw the country’s economy shrink by 1.5 percent in 2016 for the first time in two decades and recover with a slight growth estimated at 0.8% in 2017. This continuous recovery is expected to be slow and strongly linked to a sustained increase in its oil production and is thus susceptible to oil production disruptions and instability of oil prices which can have implications on social and economic progress. This was evident in the last recession as unemployment reached 18.8 percent in 2017. In addition, inflation has increased from 8.7% in 2015 to as high as 18.6% in December 2016. Food inflation reached its highest level in eight years (20%). This has adversely affected the conditions of poverty and vulnerability among Nigerian households.

In addition to the macro-economic issues, Nigeria's U5MR has currently become one of the highest in the world. To tackle this, the Nigeria Cutting Under-five mortality by half in a decade (U5/50/10) Multi-Phased Approach (MPA) program is aimed at reducing the U5MR in Nigeria in an attempt to achieve but not limited to the following co-benefits

(i) Human Capital Development through
a. Improved cognitive development: Improved child health has an important influence on the optimal cognitive development of a child. Preventing illnesses in young children and treating them effectively when they do get sick is an important part of human capital development.

b. Improved nutritional outcomes: Children who are frequently sick are also at high risk of chronic malnutrition or stunting and children who are stunted are at high risk of falling frequently ill. Breaking this vicious cycle is an important aspect of human capital development.

(ii) Reaping the demographic dividend: There has never been a significant reduction in fertility in any country of the world that was not preceded by a steep reduction in U5MR. Reducing U5MR is critical to fertility reduction and an essential aspect of obtaining a demographic dividend.

(iii) Economic take-off: Improvements in child mortality have preceded the economic take-off in East Asian “tiger” economies. Hence, improvements in economic growth in Nigeria is also dependent on significantly reduced U5MR.

Thus, reducing U5MR is not only about improving welfare of poor Nigerian children or women, it is also a crucial contributor to economic growth and an inherent part of a nation's human capital development.

ES 2: Project Objectives and Description
The overall objective of the MPA is to reduce under 5 mortality rate in Nigeria by 50% within the next decade.
The MPA enables a structured engagement into a set of linked operations, organized into two phases (See ES 2.2 and Section 2.2), with each operation contributing to the overall goal of reducing U5MR by half in ten years. See figure 14 and Table 2.1. The rationale for organizing the MPA into two sequential phases is twofold:

- To jump start the work towards achieving the overall objective of halving U5MR, the Government has requested support on malaria prevention and treatment and immunization as the first phase;
- Each phase is spaced out so that it would enable sufficient time for learning, testing of new innovations, and incorporating findings into subsequent phases.

Both phases are expected to use the investment project financing (IPF) instrument since this instrument is the most suitable for managing large results-based contracts with NSAs, and facilitates closer collaboration between the Government, development partners and the World Bank during implementation which is expected to focus on innovation and learning.

**ES 2.1: Participating States in the MPA**

There are a total of 25 states participating in this program with only Borno and Kogi participating in both the immunization and malaria programs. The other states include

- **Immunization states (14):** Adamawa, Bauchi, Benue, Borno, Ebonyi, Kaduna, Kano, Kogi, Kwara, Nasarawa, Oyo, Plateau, Sokoto, and Yobe states.
- **Malaria states (13):** Abia, Anambra, Bayelsa, Borno, Edo, Ekiti, Enugu, FCT-Abuja, Kogi, Imo, Lagos, Ondo and Rivers states

**ES 2.2: Project Phases Under This MPA**

The use of the MPA platform enables a structured engagement into a set of linked operations, organized into three phases, with each operation contributing to the overall goal of reducing U5MR into half in ten years. The MPA is divided into three phases

- **PHASE ONE (HIGH-IMPACT INTERVENTION— Immunization & Malaria Progress by Accelerating Coverage and Transforming services (IMPACT) Project):** This phase is subdivided into 3 Components:
  - **Component 1: Malaria Control:** This Component will focus on improving the delivery and uptake of malaria prevention and treatment activities ($185 million IDA; $150 million parallel financing). It is subdivided in 2 sub sub-components
    - **Sub-Component 1.1:** Expanding and Strengthening Preventive and Curative Services Through NSAs
    - **Sub-Component 1.2:** Health Systems Strengthening and Capacity Building: This sub component will support the health system and strengthen capacity at federal and state levels.

  - **Component 2: Immunization:** This component will focus on improving the delivery and uptake of routine childhood vaccines, including newly-introduced vaccines ($440 million IDA). It is subdivided into 3 sub components
    - **Sub-component 2.1:** Strengthening Service Delivery: This sub component will improve routine immunization (RI) service delivery in the context of strengthening PHC.
    - **Sub-component 2.2:** Health Systems Strengthening: This sub-component will be implemented at national and state level and will support Information and communications technology (ICT). It
will also support management strengthening through training (a learning academy), mentoring, regular review meetings involving state level officials, and use of performance frameworks.

- **Sub-component 2.3:** Vaccines and Cold Chain: The project will help finance the procurement of vaccines with an emphasis on new or recently introduced vaccines and help strengthen the cold chain.

  - **Component 3: Integration:** Integrating Monitoring and Evaluation Systems, and Community Engagement and learning ($25 million IDA). It is subdivided into 3 sub components
    - **Sub-Component 3.1:** Strengthening Monitoring and Evaluation and Operational Research: The project will support strengthening of monitoring and evaluation systems
    - **Sub-Component 3.2:** Comprehensive SBCC Activities: The project will finance the contracting of a firm to carry out formative research, development, and implementation of a comprehensive SBCC strategy for malaria and immunization using mass media and social media.
    - **Sub-Component 3.3:** Beneficiary Feedback and Grievance Redress Mechanism: The project will finance regular workshops and focus groups with beneficiaries to understand community perceptions about services.

- **PHASE TWO (STRENGTHENING PHC):** The second phase of the MPA will support a large primary health care (PHC)—strengthening investment in the Basic Health Care Provision Fund (BHCPF) as it begins to roll out.

- **PHASE THREE (INTEGRATION AND SCALE-UP):** The third phase of the MPA will be used to support the nationwide scale up of the high-impact interventions and PHC strengthening and help ensure that these complementary approaches work together coherently.

**ES 3: Project Activities and Purpose of the HCWMP**

Activities under the MPA would see an increase in the generation of HCW as a result of the procurement and subsequent usage of anti-malarial drugs for Seasonal Malarial Chemoprophylaxis (SMC), insecticides and spray equipment, larvicides for malaria control, Rapid Diagnostic Kits (RDTs), and Artemisinin Based Combination Therapy (ACTs) and Sulphadoxine Pyrimethamine (SP). The MPA would also see the procurement, usage and disposal of sharps. The use of these will cause an increase in the amount of HCW generate amongst the participating states and could ultimately have adverse impacts on the environment.

To mitigate against these impacts, the HCWMP will provide processes that implementing agencies (Federal, States, Local Government Authorities, and Healthcare Facilities Management etc) will follow to ensure the protection of healthcare workers, wastes handlers, and the community from the harmful impacts of infectious hazardous HCW that would be generated as a result of the activities under the MPA.

The HCWMP is prepared in compliance with the World Bank EA requirements on projects for World Bank financing to help ensure that they are environmentally sound and sustainable and will leverage on the National Healthcare Waste Management Policy, National Healthcare Waste Management Guidelines and
the National Healthcare Waste Management Plan thus maximizing project compliance with international
and national environmental regulations and best practices.

**ES 4: Legal & Regulatory Framework**

Nigeria has several Acts and Regulations related to HCWM in the country See Chapter 3. In addition, the
FMoH in collaboration with the FMEnv has three specific documents dealing with HCWM in Nigeria and
these are

- National Healthcare Waste Management Policy;
- National Healthcare Waste Management Guidelines; and

**ES 5: Safeguard Instruments and Public Disclosure**

The HCWMP was prepared in consultation with the relevant Federal Ministries, State Ministries, NMEP
and SMEP, NPHCDA, SPHCDAs. The FMoH will facilitate the disclosure of the HCWMP as required by the
17.50 also makes it mandatory that this HCWMP be disclosed on the World Bank external website. The
period of Disclosure for the HCWMP prepared for the MPA is 21 working days as stipulated by Nigerian
EIA Public notice.

**ES 6: Capacity Building**

There is lack of adequate knowledge among the states particularly at the PHC level and communities.
Thus, training needs identified would be targeted at Management & administrative staff of HCF, Medical
laboratory staff, Ward attendants, caretakers, ground workers and other support staff; patients, visitors,
waste management facility operator, waste collection and transportation staff, treatment system
operators and disposal managers. The cost of carrying out the training program for this MPA is Twenty
Five Thousand dollars (Nine Million Naira only).

**ES 7: Indicative Cost of Implementing the HCWMP**

The indicative cost of implementing this HCWMP is calculated annually for the 24 project states. Based on
this premise implementing the HCWMP for the MPA is estimated at One Hundred Forty Four Three Hundred
and Sixty Four Dollars Only (Fifty One Million Nine Hundred Seventy One Thousand Forty Naira Only).

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<th>S/N</th>
<th>ACTIVITY</th>
<th>INSTITUTION RESPONSIBLE</th>
<th>COSTS (USD)</th>
<th>COST (NAIRA)</th>
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<td>1</td>
<td>Provision of appropriate collection, storage and segregation bags/containers, sharp boxes at HCFs</td>
<td>NMEP, SMEPs, NSC, NPHCDA, SPHCDAs.</td>
<td>39,360</td>
<td>14,169,600</td>
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<td>2</td>
<td>Supply/provision of PPEs for HCFs (coveralls, nose guards, gloves, etc)</td>
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<td>48,000</td>
<td>17,280,000</td>
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<td>Training</td>
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<td>Monitoring and Evaluation</td>
<td>See Table 6.1</td>
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<td><strong>Sub-Total</strong></td>
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<td><strong>Contingency (10% of Sub-total)</strong></td>
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<td>13,124</td>
<td>4,724,640</td>
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<td><strong>TOTAL</strong></td>
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ES 8: Stakeholders’ Consultation

A stakeholders’ consultation was held on 13 September 2018 in Newton Park Hotel, Wuse 2, Abuja. In attendance were representatives from the FMoH, SMoH, NMEP, SMEPs excluding Ondo State, AfDB and IsDB. Also in attendance was the NC of IMPACT-NMEP. See Annex 8a for the attendance sheet. Major concerns raised included healthcare waste management and Public Disclosure. Consultations were also held at the states while site visits to some HCFs in the states was carried out.

Management of HCW was top on the priority list of concerns of stakeholders. They were also concerns about early disclosure of the instrument and the roles the SMEPs and NMEP would play in facilitating this process. Clearances were also sought on the process and duration of Disclosure which is 21 working days for a Category B project.

In addition, State visits were conducted to Benue and Kogi States. The targeted stakeholders included the staff of the HCF, SERICCs, NPHCDA, SMEPs, State Immunization Officers (SIO) and Chief Medical Officers (CMOs). The visits revealed

- There was inadequate training on HCWMP;
- There was neither a comprehensive structure as regards management of wastes nor was there any monitoring plan
- There were financial constraints
- Inadequate HCW treatment facilities such as incinerators

More details of the stakeholders’ consultation and field visits are presented in Chapter Eight.
CHAPTER 1: Background & Introduction

1.1 Introduction

Nigeria has an estimated population of 193,392,517\(^1\) making it the most populated country in Africa. Divided into 6 geo political zones, it consists of 36 states and Abuja, Federal Capital Territory. In 1980, 374 ethnic groups where identified by Onigu Otite while M. Onwuejeogwu listed over 480 ethnic groups in 1990s. This trends seems to depict a case of Nigeria being the most culturally diverse nation in the world. The country has seen robust economic growth and yet modest poverty reduction; dynamic urban growth centers and isolated rural areas; and widening social and income disparities despite an abundance of natural and human resources.

Nigeria is one of the largest economies in Africa but has in recent years faced a recession which saw the country’s economy shrink by 1.5 percent in 2016 for the first time in two decades and recovered with a slight growth estimated at 0.8% in 2017. This continuous recovery is expected to be slow and strongly linked to a sustained increase in its oil production and is thus susceptible to oil production disruptions and instability of oil prices which can have implications on social and economic progress. This was evident in the last recession as unemployment has reached up to 18.8 percent in 2017. Inflation has increased from 8.7 in 2015 to as high as 18.6 in December 2016. Food inflation reached its highest level in eight years (20%). This has adversely affected the conditions of poverty and vulnerability among Nigerian households.

Unfortunately, the recent growth of Nigeria’s economy is weakly associated with poverty reduction. The growth elasticity on poverty rates in Nigeria is estimated to be -0.6 -compared to -1.2 in sub-Saharan Africa (SSA) and -2.2 in lower-middle-income countries (LMIC) as a whole - which means that poverty rates have fallen by only a fraction of the amount that Nigeria’s economy has grown thus poverty is rife in the country. An estimated 10.5 million children are out-of-school which is the world’s highest number. Sixty percent of those children live in rural areas. For poor children under the age of 5 and living in Nigeria, they are twice likely to be stunted as poor children in Ghana and Cameroon. The socio economic implication of these is that amongst others statistics, poor women and children lack access to basic social services especially healthcare. Similarly, women in lowest two income quintiles in Nigeria are half as likely to be delivered by skilled health personnel compared Cote D’Ivoire, Senegal, Ghana, and Cameroon.

Another important statistic is Nigeria’s under 5 mortality rate (USMR). The USMR in Nigeria is the highest West Africa - more than twice the rates in Ghana and Senegal and it is also very inequitable. Nigeria will soon overtake India as the country with the highest absolute number of under-five deaths in the world due to a higher USMR and a higher fertility rate. Nigeria now accounts for about one out of every seven under-5 deaths in the world. This turns out to be true for nutritional status as well. Within Nigeria, the poorest quintile has an USMR that is 2.6 times higher than the richest quintile. See Figure 1.1: Under-5 on Infant Mortality Rates Nigeria 2003-2016. Statistics also show that about 74% of USMR in Nigeria (excluding neo-natal mortality, i.e. deaths within the first month of life) is due to three diseases (malaria, diarrhea and pneumonia). See Figure 1.2 on Causes of Under-Five Mortality (excluding neonatal mortality).

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\(^1\) Source: National Population Commission and National Bureau of Statistics Estimate
Controlling these diseases requires both preventive and curative services, the coverage of which are variable.

![Graph showing trends in IMR and USMR from 2003 to 2016]

*Figure 1.1: Under-5 and Infant Mortality Rates Nigeria 2003-2016 (Sources: Nigerian Demographic and Health Surveys – NPopC and MICS 2016-17 NBS)*

![Pie chart showing causes of under-five mortality]

*Figure 1.2 Causes of Under-Five Mortality (excluding neonatal mortality)*

To tackle this high USMR, the Federal Government of Nigeria (FGoN) in collaboration with the World Bank is currently implementing the Nigeria Cutting Under Five Mortality Rate By Fifty Percent In A Decade.

Under the MPA, the World Bank will support the expansion and strengthening of preventive and curative services; strengthening of the health systems and capacity building as well as engagement of communities while encouraging community learning of health related matters.
Reducing U5MR is not just about improving welfare, it is also a crucial contributor to economic growth and an inherent part of its human capital development. Reducing U5MR will have important socio-economic benefits for Nigeria, would include the following:

- Cognitive Development
- Nutritional Effects
- Fertility reduction
- Economic Growth
- Reductions in Child Mortality have preceded economic take-off

Thus, reducing U5MR is not only about improving welfare of the poor Nigerian child or women, it is also a crucial contributor to economic growth and an inherent part of a nation’s human capital development. This project is ultimately aimed at reducing the U5MR in Nigeria in an attempt to achieve the above mentioned benefits among other benefits.

1.2 Project Objective & Description

The overall objective of the MPA program is to reduce under 5 mortality rate in Nigeria by 50% over the next decade.

The U5MR in the country was 120 deaths per 1000 live births in the 2016-17 Multiple Indicator Clustery Survey (MICS)—this is the baseline for the operation. Thus the end target of the MPA is to reduce U5MR to 60 deaths per 1000 live births by 2029. The baseline and target may be updated based on SRS data.

A Multiphase Programmatic Approach (MPA) will be used for this program. The use of an MPA enables a structured engagement through a set of linked operations. The MPA allows Bank clients to structure a long, large, or complex engagement as a set of smaller linked operations (or phases), under one Program. This MPA is not starting de novo but builds on an extensive series of previous, ongoing and planned operations that have focused on various aspects of maternal and child health. For example, there is ongoing support for routine immunization up until 2020.

This MPA has been divided into three phases. This three phased approach of the MPA platform enables a structured engagement into a set of linked operations, organized into three phases, with each operation contributing to the overall goal of reducing U5MR by half in ten years. All three phases are expected to use investment project financing (IPF) since this instrument will help:

- Pioneer large results-based contracts with NSAs;
- Facilitate closer collaboration with the Government and its development partners; and
- Test innovations and quickly incorporate the lessons learned.

This proposed MPA will be organized into three partly overlapping phases:

- Phase I: High-Impact Interventions (i.e., malaria control and immunization);
- Phase II: Strengthening PHC (through BHCPF), and;
- Phase III: Integration and Scale-up (through dramatic expansion of the BHCPF and high-impact interventions) - see Figure 2.1 and Table 2.1.
This would allow:

(i) A rapid response to the Government’s pressing request for support to malaria control and immunization;

(ii) Working out operational challenges of the BHCPF before it begins scale-up;

(iii) An opportunity to integrate high-impact interventions and PHC strengthening and scale both nationwide; and

(iv) Conditionalities that can ensure increased domestic financing over the period of the operation.

For states to be part of the malaria control component, they will need to meet the following conditions:

- Provide dedicated financing (Naira 100 million initially) for project preparation and malaria program operations in general;
- Ensure adequate institutional capacity for program management; and
- Ensure availability of adequate and appropriate physical infrastructure for storage of LLIN and other commodities. Six out of thirteen malaria control states will be fully financed through WBG, two with WBG/AfDB joint-financing, and five with WBG/IsDB joint-financing

There are a total of 25 states participating in this program with only Borno and Kogi participating in both the immunization and malaria programs. The other states include

- **Immunization states (14):** Adamawa, Bauchi, Benue, Borno, Ebonyi, Kaduna, Kano, Kogi, Kwara, Nasarawa, Oyo, Plateau, Sokoto, and Yobe states.
- **Malaria states (13):** Abia, Anambra, Bayelsa, Borno, Edo, Ekiti, Enugu, FCT-Abuja, Kogi, Imo, Lagos, Ondo and Rivers states

### 1.3 Project Phases of MPA

#### 1.3.1 Phase One – High-Impact Intervention:

Phase I of the MPA will focus on improving immunization and malaria control activities. These high impact interventions will take precedence because: (i) they reflect the request of the Government; (ii) there are large financing gaps in malaria and immunization that are preventing these programs from covering large parts of the country thereby depriving children of access to these life-saving services; (iii) they are politically non-controversial; and (iv) they could potentially have a large and swift impact on U5MR. The Bank has substantial experience in both malaria control and immunization but the MPA will also include important innovations, including performance-based contracts with NSAs.

The project development objective (PDO) of Component 1 of this phase (IMPACT) of the MPA is to improve the delivery and uptake of immunization and malaria services in selected states.

The PDO level indicators of IMPACT are:

- Percentage of children under-five sleeping under an anti-malaria bed net the night prior to the survey
- Percentage of febrile children under-five with confirmed malaria in the last two weeks who
received artemisinin combination therapy (ACT)

- Percentage of children ages (12-23) months vaccinated with third dose of Pneumococcal Vaccine
- Percentage of children ages (12-23) months vaccinated with third dose of Pentavalent Vaccine
- Number of Beneficiaries

There are three Components under the first phase of the MPA as shown in Table 2.1 below.

**Table 1.1 Components of Phase One**

<table>
<thead>
<tr>
<th>S/N</th>
<th>PROJECT COMPONENTS</th>
<th>SUB COMPONENT DESCRIPTION</th>
</tr>
</thead>
</table>
| 1   | COMPONENT 1: MALARIA CONTROL | **Sub-Component 1.1:** Expanding and Strengthening Preventive and Curative Services Through NSAs  
(i) Provide LLINs to households and ensure nets are hung and used;  
(ii) Strengthen the management of sick children, including those with malaria, in both the public and rural private sectors;  
(iii) Distribute Sulfadoxine-Pyrimethamine (SP) to pregnant women (known as intermittent presumptive therapy or IPT) during antenatal care through both the public and rural private providers;  
(iv) Provide seasonal malaria chemo-prophylaxis (SMC) to children under-five in selected Sahelian states;  
(v) Conduct interpersonal behavior change communication to improve behavior and knowledge in rural communities; and  
(vi) Procure commodities and manage the supply chain. |
| 2   | COMPONENT 2: IMMUNIZATION | **Sub-Component 2.1:** Strengthening Service Delivery  
This sub component will improve routine immunization (RI) service delivery in the context of strengthening PHC, the project will support  
(i) Provision of decentralized operating budgets to health centers to facilitate outreach activities, vaccine delivery, maintenance and repair of immunization equipment.  
(ii) Working with civil society organizations (CSOs) and the private sector to expand RI services and ensure they reach the remotest areas;  
(iii) Implementing the Government’s community engagement framework, providing non-cash incentives for mothers, and deploying community health influencers and promoters (CHIPs);  
(iv) Provision of training and technical support to the SMEPs on:  
(a) NSA contract management and supervision; (b) data analysis and performance evaluation of the NSAs; and (c) organizing annual or semi-annual results conferences that bring together all states to learn from their implementation experience;  
(ii) Provision of training and technical support to the national malaria elimination program (NMEP) on  
(a) contract management and supervision for national level contracts (see component 3); and (b) large scale procurement of LLINs;  
(iii) Use of performance frameworks to SMEPs and NMEPs that will reward key management processes such as proper financial management, conducting supportive supervision, mobilizing domestic resources, data analysis and utilization, and effective contract management. |
(iv) Improving the organization and coverage achieved by MNCH weeks (based on an ongoing re-assessment of the organization and strategies being employed); and

(v) The strengthening of LERICCs and SERICCS through training of managers (using the mid-level management course), mentoring, performance bonuses, strengthening routine integrated supportive supervision (RISS), provision of operating budgets, as well as training of health workers on RI (through training on the Basic Guide).

Sub-component 2.2: Health Systems Strengthening
This sub-component will be implemented at national and state level and will support the following activities:

(i) Information and communications technology (ICT) will be deployed to strengthen and systematize routine data collection and supervision (RISS) through the application of “end-to-end” practical solutions; and

(ii) Management strengthening through training (a learning academy), mentoring, regular review meetings involving state level officials, and use of performance frameworks.

Sub-component 2.3: Vaccines and Cold Chain
The project will help finance the procurement of vaccines with an emphasis on new or recently introduced vaccines and help strengthen the cold chain. This sub-component will:

(i) Support the Government in financing vaccine procurement through UNICEF with an emphasis on pneumococcal vaccine, rotavirus vaccine, and meningococcal vaccine. This support will be conditional on the Government meeting its obligations on the agreed “Accountability Framework”;

(ii) Strengthen the cold chain through the deployment of equipment with maintenance contracts in keeping with the national Cold Chain Operational Plan (CCOP) and the possible rehabilitation of existing cold chain hubs; and

(iii) Support for the implementation of immunization plus days (IPDs).

Sub-component 3.1: Strengthening Monitoring and Evaluation and Operational Research
The project will support strengthening of monitoring and evaluation systems by:

(i) Establishment of a sample registration system (SRS) that will provide annual estimates, by geo-political zones, of U5MR, neonatal mortality, maternal mortality, total fertility rate, and causes of under-five deaths;

(ii) Lot quality assurance sampling (LQAS) surveys to help assess performance at LGA and state level;

(iii) Supporting annual household and health facility surveys such as SMART and NHFS; and

(iv) Conducting operational research in keeping with the learning agenda that aims to understand service delivery and how it can be improved including the rigorous testing of innovations.

Sub-component 3.2: Comprehensive SBCC Activities
The project will finance the contracting of a firm to carry out formative research, development, and implementation of a comprehensive SBCC strategy for malaria
and immunization using mass media and social media. Another firm will be recruited to provide SBCC through religious and traditional leaders. The household surveys will measure the performance of the SBCC firms and allow for the firms to adjust their SBCC strategies. Part of the learning agenda will focus on identifying best practices as implemented by these two SBCC firms to inform the next round of SBCC strategies.

**Sub-Component 3.3: Beneficiary Feedback and Grievance Redress Mechanism**

The project will finance regular workshops and focus groups with beneficiaries to understand community perceptions about services. It will also strengthen the Government’s grievance redress mechanism (“Servicom”) to ensure prompt and transparent feedback of the program performance.

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2.2.2 Phase Two – Strengthening PHC:

The second phase of the MPA will support a large primary health care (PHC)—strengthening investment in the BHCPF as it begins to roll out. Having a well-functioning PHC system is a necessary part of reducing U5MR because, despite effective preventive measures, children will get sick and require access to high-quality treatment (see table 1 above). High-quality PHC will also be needed to increase skilled-birth attendance and postnatal care which will contribute to addressing neonatal mortality (that occurring within the first month of life). Phase II will be predicated on: (i) the successful implementation of the BHCPF in three states during Phase I (although the pilot is being funded by a separate GFF grant); and (ii) the Federal Government meets its obligations under the NHAct and invests heavily in the BHCPF using its own funds. If these conditions are not met, support for PHC would be provided through a roll-out of Performance Based Financing (PBF) and Decentralized Financing Facility (DFF) to selected states.

2.2.3 Phase Three – Integration and Scale-up:

The third phase of the MPA will be used to support the nationwide scale up of the high-impact interventions and PHC strengthening and help ensure that these complementary approaches work together coherently. The intention is that Bank financing in this phase will be more modest and will be used merely to fill gaps in Government financing which should have increased by then.
1.4 Purpose of the Healthcare Waste Management Plan

The lack of an adequate Health Care Waste Management Plan (HCWMP) puts at risk healthcare workers, patients, and communities who are exposed both within Healthcare Facilities (HCFs) and the surrounding communities. Therefore, there is a need to put in place, implementable guidelines and procedures to prevent adverse impacts HCW could have on the environment.

The objective of the HCWMP is therefore to provide processes that relevant stakeholders (Federal, States, Local Government Authorities and Healthcare Facilities Managements) will follow to ensure the protection of healthcare workers, wastes handlers, and the community from the harmful impacts of infectious hazardous healthcare wastes and HAI associated with the MPA. This will also help in maximizing the project’s compliance with international and national environmental regulations and best practices. The HCWMP will also assist in eliminating and reducing the impacts HCW treatment or disposal could have on the environment. Such impacts are discussed further under Section 1.5.

It draws upon the National Healthcare Waste Management Strategic Plan and other already prepared HCWMP of other World Bank health projects in Nigeria.

This Health Care Waste Management Plan (HCWMP) is prepared in compliance with the World Bank EA requirements on projects for World Bank financing to help ensure that they are environmentally sound and sustainable.
1.5 Potential Environmental and Social Impacts Associated with Project Activities of the MPA

Improper and unsafe health care waste management (HCWM) practices put at risk healthcare workers, patients, and communities at large who are exposed both within HCFs and surrounding communities. The potential risks for the MPA is considered to be small in scope, site specific, and easy to avoid, prevent, and manage as well as remediate to acceptable levels. Hence, the MPA has been categorized as a Category B project.

As a result of the activities under the MPA, it is envisaged that there would be a significant increase in the generation of HCW. Waste generated would be as a result of the procurement and subsequent usage of anti-malarial drugs for Seasonal Malarial Chemoprophylaxis (SMC), insecticides and spray equipment, larvicides for malaria control, Rapid Diagnostic Kits (RDTs), and Artemisinin Based Combination Therapy (ACTs) and Sulphadoxine Pyrimethamine (SP) most of which come in packages. The MPA would also see the procurement, usage and disposal of sharps and HCW generated will fall into different classes including non-hazardous waste, sharps, pharmaceutical wastes, etc (See Section 4.3).

These HCW could have mainly site specific environmental and social impacts if not properly managed. There are minor concerns of off point environmental and social impacts particularly over the long term which may result from burning of HCW. Thus, there is a need to put in place by way of preparation and onward implementation of a HCWMP to address all concerns related to HCW.

There are several impacts associated with poor HCWM. Open burning and incineration of health care wastes can result in the emission of Persistent Organic Pollutants (POP) such as toxic dioxons and are toxic which do not break down in the environment. Rather, they bio-accumulate (able to move up the food chain). In addition, some dioxins such as 2,3,7,8 tetrachlorinated carcinogen and short term exposures may result in skin lesions and altered liver function. Long-term or chronic exposure to some dioxins are also related with impairment of the immune system, the developing nervous system, the endocrine system and reproductive functions.

Health-care waste contains potentially harmful microorganisms that can infect hospital patients, health workers and the general public. Other potential hazards may include the adaptation of species resulting in more drug-resistant microorganisms which spread from health facilities into the environment disrupting the ecosystem and adversely affecting health. There are also occupational hazards and risk associated with HCW.

The management of leachate should also be considered and largely prevented by regular and frequent evacuation and disposal.

HCWM must be managed adequately and sustainably to avoid and reduce adverse environmental and social impacts, and this can be achieved adapting the National Healthcare Waste Management Plan 2013 (NHCWMP).
Generally, for the MPA, it is expected that most HCW would fall under Class 1 (Non Hazardous Waste) such as drugs and LLINs packages; Class 2 (Infectious waste) such as swabs, Class 3 (Sharps) such as injections and syringes, Class 5 (pharmaceutical wastes) such as drugs SP.
CHAPTER 2: Baseline Studies

4.1 General Overview of Nigeria

Nigeria is located between latitude 9°4′N and longitude 7°29′E. It shares a 773 km border with the Republic of Benin in the west, an 87 km border with Chad and a 1,690 km border with Cameroon in the east. It is also bordered by a 1,497 km border with the Republic of Niger in the north and finally it has a coastline with the Atlantic Ocean in the south which extends for about 853 km. Its entire geographic landmass covers an area of 923,768 square kilometers making it the 32 largest country in the world.

Its population is estimated to be 193,392,517 according to NBS which means it accounts for 2.57% of the total world population and about 47 percent of West Africa’s population. It is also the seventh largest country by population in the world. Population density is estimated to be 215 per km². 51% of its population is distributed in urban centers and with a median age of 17.9 years, it has the third largest youth population in the world, after India and China, with more than 90 million of its population under age 18. By 2100 the UN estimates that the Nigerian population will be between 505 million and 1.03 billion people. Women constitute 49.2% and men 50.8%. Population growth rate is estimated at 3.2%. Tables 4.1 below show the relevant baseline for the 13 selected participating states.
Table 2.1 General Healthcare Baseline of 24 Participating States

<table>
<thead>
<tr>
<th>S/N</th>
<th>STATE</th>
<th>HEALTHCARE INFORMATION</th>
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<tbody>
<tr>
<td>1</td>
<td>Abia</td>
<td>Only 14.6% of PHC have basic medical equipment. Uneven distribution of HCF. Inadequate facilities to treat HCW. Only about 15% of PHC have basic medical equipment. Percentage of PHCs with Oral Contraceptive Pills, injectables is estimated at 39% and 47% respectively. Total Fertility Rate is put at 5.1 births per woman. Immunization is low with only 34% of children between 12 – 23 months having full immunization* and 78.7%, 12.6% and 4.7% of this are carried out in Government Health centres, immunization campaigns and private/NGOs. Facilities respectively. Only 32.8% of HCF provide LLIN. In 2014, U5MR was estimated at 83 deaths per 1000** and HIV prevalence rate is estimated at 3.3%. HIV population was estimated at 81,583.</td>
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<tr>
<td>2</td>
<td>Adamawa</td>
<td>Only 77.7% of PHC have basic medical equipment. Access to health services is less than 10 per cent. Percentage of PHCs with Oral Contraceptive Pills, injectables is estimated at 19.4% and 15.3% having injectables and pills respectively. Total Fertility Rate is put at 5.5 births per woman. Immunization is low with only 29% of children between 12 – 23 months having full immunization* and 63.1%, 5.8% and 1.9% of these are carried out in Government Health centres, immunization campaigns and private/NGOs facilities respectively. Only 33.3% of HCF provide LLIN. U5MR is 84 deaths per 1000** and HIV prevalence rate is estimated at 1.9%. HIV population was estimated at 75,285 in 2014</td>
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<tr>
<td>3</td>
<td>Anambra</td>
<td>Only 32.2% of PHC have basic medical equipment. Percentage of PHCs with Oral Contraceptive Pills, injectables is estimated at 45% and 59% respectively. Immunization is low with only 55% of children between 12 – 23 months having full immunization* and 59.8%, 24.3% and 18.7% of these are carried out in Government Health centres, immunization campaigns and private/NGOs facilities respectively. Total Fertility Rate is put at 4.3 births per woman. About 83.1% of HCF provide LLIN. U5MR is 53 deaths per 1000** and HIV prevalence rate is estimated at 1.2%. HIV population was estimated at 52,995 in 2014</td>
</tr>
<tr>
<td>4</td>
<td>Bauchi</td>
<td>Only 51.3% of PHC have basic medical equipment. Percentage of PHC with Oral Contraceptive Pills, injectables is estimated at with 26.4% and 25% respectively. Immunization is low with only 14% of children between 12 – 23 months having full immunization* and 46.4%, 35.5% and 0.7% of these are carried out in Government Health centres, immunization campaigns and private/NGOs facilities respectively. Total Fertility Rate is put at 4.3 births per woman. About 42.8% of HCF provide LLIN. U5MR is 161 deaths per 1000** and HIV prevalence rate is estimated at 1.2%. HIV population was estimated at 52,995 in 2014</td>
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<tr>
<td>5</td>
<td>Bayelsa</td>
<td>Only 22.5% of PHC have basic medical equipment. It has the poorest record of maternal mortality rate (1,870/100,000) among the states of the south-south region in particular and the country in general. It also has one of the highest child mortality rates in the country with 80 deaths per thousand. Percentage of PHCs with Oral Contraceptive Pills, injectables is estimated at with 13% and 13% respectively. Immunization is low with only 28% of children between 12 – 23 months having full immunization* and 71.6%, 1.8% and 5.5% of these are carried out in Government Health centres, immunization campaigns and private/NGOs facilities respectively. Total Fertility Rate is put at 4.8 births per woman. About 5.6% of HCF provide LLIN. U5MR is 95 deaths per 1000**. HIV prevalence rate is estimated at 2.7% while the HIV population was estimated at 30,858 in 2014.</td>
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<tr>
<td>6</td>
<td>Benue</td>
<td>Only 17.9% of PHC have basic medical equipment. Percentage of PHC with Oral Contraceptive Pills, injectables is estimated at with 11.0% and 25.4% respectively. Immunization is low with only 37% of children between 12 – 23 months having full immunization* and 60.0%, 10.9% and 4.5% of these are carried out in Government Health centres, immunization campaigns and private/NGOs facilities respectively. Total Fertility Rate is put at 4.8 births per woman. About 50.2% of HCF provide LLIN. U5MR is 82 deaths per 1000** and HIV prevalence rate is estimated at 5.62%. HIV population was estimated at 196,270 in 2014.</td>
</tr>
<tr>
<td>7</td>
<td>Borno</td>
<td>Insurgency is a major factor affect the healthcare in the state. At least 248 PHC and 19 General hospitals have been destroyed by Boko Haram. An estimated total of 64% HCF are completely or partially destroyed, with only 288 fully functional. With this has come several health diseases including an increase in malaria-related deaths and over 860 new diarrhea and Cholera cases every single day. Also on the increase is hepatitis E (256 reported cases), measles (18 cases), acute diarrhea (1665 cases) and acute respiratory infection (1548 cases).</td>
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<tr>
<td>State</td>
<td>Health Care Challenges</td>
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<tr>
<td>Enugu</td>
<td>Only 6.3% of PHC have basic medical equipment. Percentage of PHC with Oral Contraceptive Pills, injectables is estimated at with 28.0% and 20.0% respectively. Immunization is low with only 31% of children between 12 – 23 months having full immunization* and 32.3%, 22.6% and 46.8% of these are carried out in Government Health centres, immunization campaigns and Government hospitals respectively. Total Fertility Rate is put at 6.1 births per woman. About 6.7% of HCF provide LLIN. USMR is 82 deaths per 1000** and HIV prevalence rate is estimated at 2.4%. HIV population was estimated at 75,388 in 2014.</td>
<td></td>
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<tr>
<td>Edo</td>
<td>HEALTHCARE: Only 17.7% of PHC have basic medical equipment. Percentage of PHC with Oral Contraceptive Pills, injectables is estimated at with 56.2% and 55.0% respectively. Immunization is low with only 35% of children between 12 – 23 months having full immunization* and 79.5%, 8.0%, 13.6% and 10.2% of these are carried out in Government Health centres, immunization campaigns, Government hospitals and private/NGOs facilities respectively. Total Fertility Rate is put at 5.2 births per woman. 79.3% of HCF provide LLIN. USMR is 62 deaths per 1000** and HIV prevalence rate is estimated at 0.9%. HIV population was estimated at 29,156 in 2014.</td>
<td></td>
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<tr>
<td>Ekiti</td>
<td>HEALTHCARE: Inaccessibility to HCF, lack of man power and have been the major problems. There is also a lack of equipment and basic tools. The birthrate and maternal mortality rate are high. Malaria and diarrheal dehydration are endemic. Only half the population is vaccinated. Over three-quarters of the population does not have access to primary health care. AIDS is straining the health care system. The rates of infection is three times higher in rural areas. People often employ more than one system of healing. Even those who have access to an infirmary or clinic may visit herbalists or other healers. 46.8% of PHC have basic medical equipment. Percentage of PHC with Oral Contraceptive Pills, injectables is estimated at with 49.3% and 51.9% respectively. 46% of children between 12 – 23 months have full immunization* and 47.8, 35.8%, 12.0% and 14.9% of these are carried out in Government Health centres and immunization campaigns and private/NGOs facilities respectively. Total Fertility Rate is put at 3.8 births per woman. 63.0% of HCF provide LLIN. USMR is 83 deaths per 1000** and HIV prevalence rate is estimated at 0.8%. HIV population was estimated at 22,821 in 2014.</td>
<td></td>
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<tr>
<td>Imo</td>
<td>HEALTHCARE: Major challenges is centered on immunization with a coverage of 8.3% in the state. Other challenges include unavailability of sufficient vaccines such as DPT1, 2 and 3 (DPT1-DPT2/DPT3). The dropout rate for immunization is very high (494%). Family planning activities, integrated management of childhood illnesses program is also very low in the state. As with all states, basic equipment and drugs are lacking. 8.6% of PHC have basic medical equipment. Percentage of PHCs with Oral Contraceptive Pills, injectables is estimated at 28.9% and 23.2% respectively. 51% of children between 12 – 23 months have full immunization* and 79.5%, 10.2%, 13.6 and 8.0% of these are carried out in Government health centers, private/NGOs facilities, government hospitals and immunization campaigns respectively. Total Fertility Rate is put at 3.8 births per woman. About 49.2% of HCF provide LLIN. USMR is 86 deaths per 1000** and HIV prevalence rate is estimated at 1.3%. HIV population was estimated at 34,268 in 2014.</td>
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<td>Imo</td>
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<tr>
<td>State</td>
<td>Healthcare</td>
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<tr>
<td>Kaduna</td>
<td>HEALTHCARE: As with all states of Nigeria, PHC are in poor condition. 7.6% of PHC have basic medical equipment. Percentage of PHCs with Oral Contraceptive Pills, injectables is estimated at 39.3% and 52.4% respectively. 25% of children between 12 – 23 months have full immunization* and 32.2%, 5.0%, 58.7% and 31.4% of these are carried out in Government health centers, private/NGOs facilities, government hospitals and immunization campaigns respectively. Total Fertility Rate is put at 5.6 births per woman. About 22.2% of HCF provide LLIN. USMR is 82 deaths per 1000** and HIV prevalence rate is estimated at 2.1%. HIV population was estimated at 334,445 in 2014.</td>
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<tr>
<td>Kano</td>
<td>HEALTHCARE: 1.5% of PHC have basic medical equipment. Percentage of PHCs with Oral Contraceptive Pills, injectables is estimated at 32.3% and 27.9% respectively. 10% of children between 12 – 23 months have full immunization* and 18.3%, 1.4%, 57.4% and 21.5% of these are carried out in Government health centers, private/NGOs facilities, government hospitals and immunization campaigns respectively. Total Fertility Rate is put at 7.7 births per woman. 36.5% of HCF provide LLIN. USMR is 203 deaths per 1000** and HIV prevalence rate is estimated at 1.4%. HIV population was estimated at 165,530 in 2014.</td>
</tr>
<tr>
<td>Kogi</td>
<td>HEALTHCARE: 14.9% of PHC have basic medical equipment. Percentage of PHCs with Oral Contraceptive Pills, injectables is estimated at 3.2% and 3.2% respectively. 30% of children between 12 – 23 months have full immunization* and 32.6%, 13.3%, 56.3% and 7.4% of these are carried out in Government health centers, private/NGOs facilities, government hospitals and immunization campaigns respectively. Total Fertility Rate is put at 4.4 births per woman. 47.6% of HCF provide LLIN. USMR is 45 deaths per 1000** and HIV prevalence rate is estimated at 1.4%. HIV population was estimated at 36,515 in 2014.</td>
</tr>
<tr>
<td>Kwara</td>
<td>HEALTHCARE: 13.0% of PHC have basic medical equipment. Percentage of PHCs with Oral Contraceptive Pills, injectables is estimated at 7.2% and 13.3% respectively. 34% of children between 12 – 23 months have full immunization* and 57.8%, 3.3%, 31.1% and 16.7% of these are carried out in Government health centers, private/NGOs facilities, government hospitals and immunization campaigns respectively. Total Fertility Rate is put at 4.4 births per woman. 47.6% of HCF provide LLIN. USMR is 45 deaths per 1000** and HIV prevalence rate is estimated at 1.4%. HIV population was estimated at 36,515 in 2014.</td>
</tr>
<tr>
<td>Lagos</td>
<td>HEALTHCARE: 40.2% of PHC have basic medical equipment. Percentage of PHCs with Oral Contraceptive Pills, injectables is estimated at 12.0% and 13.4% respectively. 68% of children between 12 – 23 months have full immunization* and 74.4%, 13.9%, 12.2% and 2.8% of these are carried out in Government health centers, private/NGOs facilities, government hospitals and immunization campaigns respectively. Total Fertility Rate is put at 5.0 births per woman. 81.5% of HCF provide LLIN. USMR is 50 deaths per 1000** and HIV prevalence rate is estimated at 2.2%. HIV population was estimated at 196,839 in 2014.</td>
</tr>
<tr>
<td>Nasarawa</td>
<td>HEALTHCARE: 45.8% of PHC have basic medical equipment. Percentage of PHCs with Oral Contraceptive Pills, injectables is estimated at 17.0% and 25.5% respectively. 21% of children between 12 – 23 months have full immunization* and 52.0%, 2.4%, 26.0% and 33.3% of these are carried out in Government health centers, private/NGOs facilities, government hospitals and immunization campaigns respectively. Total Fertility Rate is put at 5.7 births per woman. 24.3% of HCF provide LLIN. USMR is 121 deaths per 1000** and HIV prevalence rate is estimated at 8.1%. HIV population was estimated at 106,159 in 2014.</td>
</tr>
<tr>
<td>Ondo</td>
<td>HEALTHCARE: 54.5% of PHC have basic medical equipment. This figure is second only to Adamawa State. Percentage of PHCs with Oral Contraceptive Pills, injectables is estimated at 17.8% and 16.4% respectively. 45% of children between 12 – 23 months have full immunization* and 84.7%, 12.1% and 14.5% of these are carried out in Government health centers, government hospitals and immunization campaigns respectively. Total Fertility Rate is put at 4.5 births per woman. 84.2% of HCF provide LLIN. USMR is 67 deaths per 1000** and HIV prevalence rate is estimated at 4.3%. HIV population was estimated at 49,281 in 2014.</td>
</tr>
<tr>
<td>Oyo</td>
<td>HEALTHCARE: 21.9% of PHC have basic medical equipment. Percentage of PHCs with Oral Contraceptive Pills, injectables is estimated at 19.0% and 19.6% respectively. 37% of children between 12 – 23 months have full immunization* and 65.1%, 7.3%, 20.2% and 14.7% of these are carried out in Government health centers, private/NGOs facilities, government hospitals and immunization campaigns respectively. Total Fertility Rate is put at 4.9 births per woman. 56.5% of HCF provide LLIN. USMR is 73 deaths per 1000** and HIV prevalence rate is estimated at 5.6%. HIV population was estimated at 172,980 in 2014.</td>
</tr>
<tr>
<td>No.</td>
<td>State</td>
</tr>
<tr>
<td>-----</td>
<td>-------------</td>
</tr>
<tr>
<td>21</td>
<td>Plateau</td>
</tr>
<tr>
<td>22</td>
<td>Rivers</td>
</tr>
<tr>
<td>23</td>
<td>Sokoto</td>
</tr>
<tr>
<td>24</td>
<td>Abuja FCT</td>
</tr>
<tr>
<td>25</td>
<td>Yobe</td>
</tr>
</tbody>
</table>

3.1 Relevant Nigeria’s National Policies

This Chapter examines the Policies, Acts and Regulations as they relate to the MPA. It examines the Nigerian policies on environment and health and lastly, examines World Bank policies that are relevant to this project. It is expected that the World Bank policies shall supersede those of the country except when those of the country are adequate or more stringent. Table 3.1 below shows Policies relevant to the MPA as well as their objectives.

Table 3.1: Nigerian Policies that are Relevant to HCWM Associated with the MPA

<table>
<thead>
<tr>
<th>POLICY</th>
<th>OBJECTIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Policy on the Environment (Revised 2016)</td>
<td>Summary: It describes strategies for achieving the policy goal of sustainable development. Sanitation and waste management as well as toxic and hazardous substances are presented. No specific mention is made of HCW, although a number of points can be applied to hazardous substances. Other Objectives: ▪ Ensuring and securing the quality of Nigeria’s environment to support good health and well-being; ▪ Promoting efficient and sustainable use of Nigeria’s natural resources and the restoration and maintenance of the biological diversity of ecosystems; ▪ Promoting understanding of essential linkages between the environment, social and economic developmental issues; ▪ Encouraging individual and community participation in environmental improvement initiatives; ▪ Raising public awareness and engendering a national culture of environmental preservation; and ▪ Building partnership among all stakeholders, including government at all levels, international institutions and governments, non-governmental agencies and communities on environmental matters.</td>
</tr>
</tbody>
</table>

3.2 Relevant National Acts

Table 3.2 below shows the Acts relevant to the MPA as well as their objectives.

Table 3.2: Nigerian Acts that are Relevant to HCWM Associated with the MPA

<table>
<thead>
<tr>
<th>S/N</th>
<th>ACT</th>
<th>DESCRIPTION / SUMMARY OF OBJECTIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EIA Act - CAP. E12 L.F.N. 2004</td>
<td>Sets out the procedures and methods for Environmental Impact Assessments on both public and private projects and states that the “construction of incineration plants” requires an environmental assessment. It also mandates - ▪ Carrying out an EIA on all projects likely to have significant impact on the environment; and ▪ Encouraging information exchange and consultation between all stakeholders when proposed activities are likely to have significant impact on the environment.</td>
</tr>
<tr>
<td>2</td>
<td>Harmful Waste (Special Criminal Provisions, etc.) Act 1988</td>
<td>It prohibits the carrying, depositing and dumping of harmful wastes (injurious, poisonous, toxic or noxious substance) and prescribes penalties for those found guilty of improper practices. It also ▪ Criminalizes all activities relating to the purchase, sale, importation, transit, transportation, deposit, storage of harmful wastes; and ▪ By this Act it is unlawful to dump harmful waste in the air, land or waters of Nigeria</td>
</tr>
</tbody>
</table>
3.3 Relevant National Regulations

Table 3.3 below shows Regulations relevant to the MPA as well as their objectives/description.

<table>
<thead>
<tr>
<th>S/N</th>
<th>REGULATION</th>
<th>OBJECTIVE(S) AND RELEVANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>National Environmental (Sanitation and Wastes Control) Regulations, 2009. S.I. No. 28</td>
<td>To provide the legal framework for the adoption of sustainable and environment friendly practices in environmental sanitation and waste management to minimize pollution.</td>
</tr>
<tr>
<td>2</td>
<td>National Effluent Limitation Regulations, 1991</td>
<td>This Regulation requires that every industry shall install anti-pollution equipment for the detoxification of effluent and chemical discharges emanating from the industry and specify selected waste water parameters for the industries in the First Schedule to these Regulations. The anti-pollution equipment shall be based on the Best Available Technology (BAT), the Best Practical Technology (BPT) or the Uniform Effluent Standard.</td>
</tr>
<tr>
<td>3</td>
<td>National Environmental Protection (Management of Solid and Hazardous Wastes) Regulations 1991</td>
<td>This Regulation regulates the handling and management of solid, radioactive and (infectious) hazardous waste. It defines objectives of the management of solid and hazardous waste, the functions of appropriate Governmental agencies and the obligations of industries/facilities that generate the wastes. It also classifies waste, makes provision for contingency plans, emergency procedures, groundwater protection, ground water monitoring requirements. Part 12 of this regulation provides for the tracking of wastes from their point of generation to the final disposal with specific details regarding HCW.</td>
</tr>
<tr>
<td>4</td>
<td>National Environment Protection (Pollution Abatement in Industries and Facilities Producing Waste) Regulations, 1991</td>
<td>By this regulation, no industry or facility shall release hazardous or toxic substances into the air, water or land of Nigeria's ecosystems beyond limits approved by the Federal Environmental Protection Agency. It imposes restrictions on the release of toxic substances and stipulates requirements for monitoring of pollution to ensure that permissible limits are not exceeded.</td>
</tr>
<tr>
<td>5</td>
<td>National Environmental (Surface and Groundwater Quality Control) Regulations, 2010. S.I. No. 22</td>
<td>To restore, enhance and preserve the physical, chemical and biological integrity of the nation’s surface waters, and to maintain existing water uses.</td>
</tr>
<tr>
<td>6</td>
<td>National Environmental (Control of Bush/Forest Fire and Open Burning) Regulations, 2011, S.I. No. 15</td>
<td>To prevent and minimize the destruction of ecosystem through fire outbreak and burning of any material that may affect the health of the ecosystem through the emission of hazardous air pollutants.</td>
</tr>
</tbody>
</table>
To prevent and minimize pollution from all operations and ancillary activities of the domestic and industrial plastic, Rubber and Foam Sector to the Nigerian environment.


Nigeria has developed a trio of documents to tackle, regulate and provide guidelines for HCWM in the country. These three documents are

- National Healthcare Waste Management Policy (See Table 3.4)
- National Healthcare Waste Management Guidelines (See Table 3.5)
- National Healthcare Waste Management Plan (See Table 3.6)

All three documents were prepared in collaboration between the Federal Ministry of Health and the Federal Ministry of Environment. This is a clear indication of the reality of the importance of proper HCWM and how it impacts on the environment.

<table>
<thead>
<tr>
<th>Table 3.4 Summary of the National Healthcare Waste Management Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NATIONAL HEALTH-CARE WASTE MANAGEMENT POLICY 2013</strong></td>
</tr>
<tr>
<td><strong>Summary</strong></td>
</tr>
<tr>
<td><strong>Definition</strong></td>
</tr>
<tr>
<td><strong>Comments</strong></td>
</tr>
<tr>
<td><strong>Suggestions</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3.5 Summary of the National Healthcare Waste Management Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NATIONAL HEALTH-CARE WASTE MANAGEMENT GUIDELINES 2013</strong></td>
</tr>
<tr>
<td><strong>Summary</strong></td>
</tr>
<tr>
<td><strong>Definition</strong></td>
</tr>
</tbody>
</table>
Comments
HCWM is constitutionally the responsibility of the FMEnv and SEPAs, with necessary input and support from the health ministries. Formulation and implementation of HCWM policies and regulations rest with the FMEnv in collaboration with FMoH.

Suggestion
There is certainly the need for HCWM planning, formulating and implementing bodies to take into consideration the challenges procuring pragmatic and affordable HCWM disposal technologies.

### Table 3.6 Summary of the National Healthcare Waste Management Plan

<table>
<thead>
<tr>
<th>Summary</th>
<th>NATIONAL HEALTH-CARE WASTE MANAGEMENT PLAN 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>This document presents strategies for the management of HCW taking into account the technical, financial and legal aspects, as well as public awareness, discussing also responsibility of the different levels of government (Local, State and Federal) and furthermore highlighting critical areas and possible solutions.</td>
<td></td>
</tr>
<tr>
<td>Definition</td>
<td>A NHCWM plan looks at practical steps to ensure that hazardous and non-hazardous medical wastes are managed properly to protect humans and the environment against the adverse effects which may occur as a result of indiscriminate handling of such wastes.</td>
</tr>
<tr>
<td>Comments</td>
<td>This document provide basic information about the development and implementation of HCWM plans as well as HCW types, treatment and disposal methods, also thus defining duties and responsibilities of staffs for different categories of HCFs in Nigeria.</td>
</tr>
</tbody>
</table>
CHAPTER 4: Healthcare Waste Management in Nigeria

4.1 General and Healthcare Waste Management in Nigeria

As a result of several factors including poor funding and lack of suitable capacity, a very low percentage of HCF in Nigeria practice suitable or safe HCWM. Thus there is a need to set aside additional funding to cater for HCWM if the impacts envisaged under the MPA are to be adequately managed.

Healthcare Waste (HCW) in Nigeria is defined as “all waste generated by healthcare establishments (human or veterinary), including research facilities and laboratories. It can include waste generated in the course of healthcare in homes.” There are a wide range of HCW generated in Nigeria and these have been classified into 8 classes. See Section 4.3 and Table 4.1. Though there are HCW that are non-hazardous which are also of importance, it is the hazardous HCW that is of paramount concern, due to the potential to cause infections, disease or injury.

When HCW is properly managed and treated, it poses little risks. Thus, the risks are manageable and can be mitigated. For the MPA, there will be concerns from handling HCW resulting from project related activities that will generate HCW such as expired vaccines and sharps, pharmaceuticals, needles and syringes etc.

4.2 HCW Composition

The quantity and composition of wastes generated by Nigeria HCFs varies greatly between the different categories and location. For instance, in a 2006 Medical Waste Management survey in sampled health institutions in the Federal Capital Territory (FCT), it was found that 26.5% of the healthcare waste to be hazardous. This figure is expected to be much higher in the states and local governments. Variations in the composition of waste raises serious issues at the local level which require different approaches with respect to necessary HCWM procedures to be applied in order to achieve sustainability. The variations may be due to several factors among which are differences in HCF specialization, numbers of qualified health care personnel available, HCW practices prevailing as well as recycling and reuse.

According to the National Healthcare Waste Management Policy, National Healthcare Waste Management Guidelines and the National Healthcare Waste Management Plan, the average distribution on types of HCW in Nigeria is shown in Fig 4.1 below
State visits showed that most wastes generated at the PHCs fall under general waste which makes up more than 80% of their wastes. There is waste also generated from sharps which varies between 1 to 3 sharp boxes a week between low and high patronage PHCs respectively. This is similar to the composition of waste in Nigeria as shown in Fig 4.1

**4.3 Classification of Healthcare Waste in Nigeria**

The Nigeria Healthcare Waste Management Guideline 2013 categorizes HCW in Nigeria into three broad classes. These are:

- Non Hazardous and general waste
- Hazardous healthcare waste which is subdivided into 5 (Infectious waste, Pathological/ Anatomical Waste, Chemical wastes, Genotoxic, Mercury wastes)
- Highly Hazardous waste which is subdivided into 3 (Sharps, Highly infectious waste, Radioactive waste)

Based on these classifications, 8 different classes are identified. See Table 4.1 healthcare waste classification in Nigeria with examples.

When Sharps are improperly handled and disposed of, they and more specifically needles are considered the most hazardous category of health-care waste particularly for health-care workers and the community at large. This is because needle-stick injuries can easily occur and carry a high potential for infection. See Section 4.6.

**4.4 General State of HCWM Practices in Nigeria**

In general, HCW is poorly managed in Nigeria and the major constraints with HCWM practices in Nigeria range from inadequate funding, availability of resources and inadequate infrastructure. There is also a low level of manpower training that currently exists for HCWM at all levels all across Nigeria.
Study results indicate that 18% of HCF incinerate their solid wastes in locally built brick incinerators without adequate protection to the environment; 36.3% of the institutions simply dispose of their HCW into municipal dumpsite. These HCW were found not to be treated before dumping into the dustbin at the dumpsite; 9.1% buried their solid wastes; while another 36.3% had their waste burnt off in open pits. Liquid HCW were disposed directly into the municipal sewer system by most HCFs. Waste segregation and non-thermal waste disposal techniques such as autoclaving were not used for HCWM by any of the selected healthcare institutions surveyed.

A survey by the FMoH revealed that safety boxes were not used in 63% of HCF and there were no sharps boxes in 69% of all injections delivery points. States visited revealed a contradiction to this with most PHCs having sharp boxes. Only 29% of providers placed the needle and syringe in a closed container immediately after injection. After vaccinations, 63% of providers placed used injection equipment in over-flowing, pierced or open containers. Injection equipment was found in containers other than safety boxes or in open or overflowing containers in 83% of all survey sites. Used sharps were found on the grounds of 65% of all healthcare facilities visited while unsupervised open dumping was found in 22% of facilities.

An analysis of the current situation was conducted with respect to HCW generation segregation, collection, transportation, and disposal. Medical wastes includes infectious wastes such as; swabs, syringes, blades, gloves are mostly mixed with municipal waste and disposed in open dumps where they are either burnt or left to decay.

In urban areas, unregulated practices by both public, private hospitals and private waste collectors has resulted in dumping of medical waste (infectious and sharps) at municipal dump sites. Scavenging at these disposal sites pose severe public health risks while the possibilities of infections are very high considering the fact that scavengers do not wear any form of personal protection. To curb and reduce the exposure of healthcare workers, PPEs shall be provided and worn by HCF staff. For waste pickers, all HCW within the HCF must be cordoned off and secured from easy access while disposal of HCW shall be to a designated and approved sanitary landfills after treatment on the initial waste has been carried out.
<table>
<thead>
<tr>
<th>S/N</th>
<th>CATEGORY OF WASTE</th>
<th>SUB CATEGORY OF WASTE TYPE</th>
<th>DESCRIPTION AND EXAMPLES</th>
<th>EXAMPLES OF WASTE</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Non-hazardous and general wastes</td>
<td></td>
<td>Waste that has not been contaminated with infectious materials or other hazardous materials.</td>
<td>Paper, cardboard, plastic, kitchen waste, ash, sawdust, pieces of wood segregated from hazardous waste</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>Infectious waste</td>
<td></td>
<td>Generated by both inpatients/out-patients or animals. It's likely to contain pathogenic microorganisms and can be dangerous or infectious to both patients, health care workers and the public.</td>
<td>Laboratory waste, materials potentially infected blood, swabs, materials that have been in used in surgery or been in contact with patients</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Pathological/Anatomical Waste</td>
<td></td>
<td>Amputations and other body tissues resulting from surgical operations, autopsy (post-mortem), or delivery. Requires special treatment for ethical and aesthetic reasons</td>
<td>Internal body organs, amputated limbs, placentas, foetus. Also includes urine and blood products</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Chemical waste</td>
<td></td>
<td>Wastes, including expired products, generated from the pharmacy, and from chemotherapy</td>
<td>Vials, connecting tubing, drugs, vaccines, pharmaceutical products, disinfection solutions, medicines, expired drugs, drugs, and vaccines</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Pharmaceutical Waste</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Genotoxic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mercury Waste</td>
<td></td>
<td>Any mercury containing device</td>
<td>Wastes from mercury containing devices such as batteries, dental amalgam, thermometers, and blood-pressure gauges and fluorescent tubes</td>
<td>8</td>
</tr>
<tr>
<td>C</td>
<td>Sharps</td>
<td></td>
<td>These are sharp-edged wastes that can cause cuts or puncture wounds. They are highly hazardous whether or not they are contaminated with blood</td>
<td>Needles, syringes, surgical blades, scalpels, test tubes, ampoules, glass instruments, pipettes,</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Highly Infectious Waste</td>
<td></td>
<td>These highly infectious wastes required immediate treatment by chemical disinfectants or autoclaving before joining the hazardous HCW stream.</td>
<td>Sputum cultures of TB laboratories, contaminated blood clots and glassware, highly concentrated microbial cultures carried out in medical analysis laboratories</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Radioactive Waste</td>
<td></td>
<td>Any solid, liquid, or pathological waste contaminated with radioactive isotopes of any kind</td>
<td>Radioactive papers, gloves, cotton swabs, needles (sharps), liquids, patient excretion, spent radiation sources radium needles.</td>
<td>7</td>
</tr>
</tbody>
</table>
4.5 Healthcare Waste Management Constraints in Nigeria

It is estimated that an average of 20% of the waste generated by HCFs are hazardous in nature. Studies show there is also a large lack of training in HCWM and HCWMP in practice was almost non-existent. The major shortcomings in the current HCWM in Nigeria include:

- Absence of HCWM plans in most medical institutions;
- Weak coordination of HCWM system at all levels;
- Poor/lack of segregation of healthcare waste at health facility levels;
- Deficient/non-existent HCW color-coding and labelling system;
- Poor hygiene practices in collection, storage, transportation, treatment and final disposal of healthcare waste;
- Waste handlers lack Personal protective equipment (PPE);
- Indiscriminate dumping of healthcare waste into public dumpsites;
- Use of locally built low temperature incinerators without adequate protection to the environment;
- Healthcare solid wastes are either buried or burnt at low temperature in open pits;
- High risks of injury and infection to healthcare waste handlers and waste pickers;
- Absence of post exposure prophylaxis (PEP) to those who sustain needle stick injury, with increased risk of HIV, HBV & HCV infections; and
- Lack of healthcare waste management information system.

4.6 Risks Associated with Healthcare Waste Generated in Nigeria

Healthcare waste management is an integral part of hygiene and infection control within a health care facility and safe HCWM will help control infections, occupational hazards and protect environmental social health. All individuals exposed to HCW are potentially at risk of being injured or infected. These individuals include:

- Medical staff: doctors, nurses, pharmacists, laboratory scientists, etc;
- In- and out-patients and their visitors;
- Workers in support services such as laundries, waste handling, maintenance personnel, cleaning staff, and transportation staff;
- Workers in waste disposal facilities, including scavengers; and
- General public, including children playing with hazardous items that they find in the waste outside the health care facilities (HCF) when it is made accessible through improper HCWM.

The general public can be infected by HCW either directly or indirectly through several pathways of contamination. Dumping HCW in open areas is a practice that can have major adverse effects on the population. Reuse of improperly disposed injection equipment is another route of infection by HCW. WHO estimates that over 20 million infections of hepatitis B, C and HIV occur yearly due to unsafe injection practices (reuse of syringes and needles in the absence of sterilization). Furthermore, there is a risk for public health as regards the sale of recovered drugs in the informal sector and the lack of controls.

The dumping of HCW in uncontrolled areas can have a direct environmental effect by contaminating soils and underground waters. During improper burning or incineration of HCW, air can also be polluted causing...
illnesses to the nearby populations. This has to be taken into consideration when choosing a treatment or a disposal method.

### 4.7 Waste Pickers

Waste picking is a common practice in Nigeria. It serves as a means of employment and livelihood for many. Waste pickers are important as they can contribute positively to the environment in terms of re-use and recycling of waste. However, some studies have reiterated that some classes of HCW usually discarded at rubbish dumps often return to markets. Reports have shown that waste pickers usually pick carelessly dumped HCW (especially syringes) from dumpsites at night only to resell same to their customers. To mitigate against this activity, all HCW sent to dumpsites must have been properly treated as outlined in Chapter 6.

In terms of recycling, re-use and recovery of materials they play a significant role. Wastes such as plastics and nylon bags which usually take more than 400 years to biodegrade in landfills are often targeted by the waste pickers and removed before they are landfilled. Removing this type of wastes (Class 1) that would otherwise have been sent to dumpsites/landfills or landfilled increases space at landfills. Although there are no comprehensive studies as to how much waste is diverted from landfilling by waste pickers, estimates suggest that about 90% of waste is not recycled.

Almost all Waste pickers (particularly at dumpsites) do not use PPEs and are easily exposed to pathogens such as Staphylococcus aureus, Pseudomonas aeruginosa and Escherichia coli etc which inevitably leads to malaise in their health. Hence as a consequence of their occupation and direct contact with waste, they usually suffer from poor health. Sickness such as fever, malaria, cuts and bruises, body aches and general weakness are reportedly common among them.

In addition, waste pickers are constantly in touch with the wider public during the course of their daily lifes and their exposure to more severe infections and diseases such as HIV (see Section 4.6) could be far reaching as they themselves could serve as pathways for the transmission of various communicable diseases to the general public.

Waste pickers are also exposed to occupational health and safety risks as a result of unsafe handling of waste materials and lack of PPE.

In Nigeria waste pickers can generally be divided into two

- Those who scavenge in temporary storages such as wheelie bins and dumpsters; and
- Those who scavenge at dumpsites and landfills

The first group usually referred to as itinerant pickers, will have limited access to temporary HCW storage in the HCW if such areas are cordoned off. Secured temporary storage areas particularly at unfenced HCF’s will reduce access and the risk of waste pickers getting infected by HCW since they cannot access such areas.

The second set of waste pickers will be protected to a large extent if HCW reaching dumpsites and landfills are well treated as outlined in Chapter 6. Specifically, sharps properly incinerated into ashes or encapsulated will not be infectious and immobilized respectively.
Considering that waste picking is generally an unregulated sector, it would be hard to include them in the HCWMP. Rather than include them, the process of treatment and onward disposal outlined in this HCWMP will reduce their risk exposure to HCW and ultimately protect them from infections associated with HCW.
CHAPTER 5: Basic Principles of Healthcare Waste Management in Nigeria

5.1 Basic Principles of National Healthcare Waste Management Plan (NHWMP)

According to the National Healthcare Waste Management Plan 2013 (NHCWMP) the basic principles of HCWM involve Waste Minimization, Waste Segregation, Color Coding, Waste Collection, Waste Storage and Transportation. These are discussed under the 5.1.1 to 5.1.8.

5.1.1 Waste Minimization

The best practice here is to ensure that all units in each HCF minimizes their waste generation (all classes of wastes) to the barest possible minimum. Appropriate plans, strategies and actions should be established to ensure adequate HCW minimization at source. Such strategies should be aimed towards:

- Purchasing restrictions to ensure the selection of less wasteful materials;
- Encouraging the use of recyclable materials and products;
- Reducing unnecessary injections and encouraging use of oral alternatives, when appropriate;
- Ensuring good management and control practices especially in the purchase and use of pharmaceuticals; and
- Enforcing a rigorous and careful segregation of the HCW at source.

5.1.2 Waste Segregation

Proper segregation of waste at source generation (at each medical unit/department) is essential, efficient and effective in managing HCW. It helps in reducing the quantity of waste requiring treatment prior to final disposal and ultimately reduces the cost of waste treatment/management. Segregation involves putting different classes\(^2\) of wastes into separate and appropriate temporary storage colour-coded containers/bags as recommended by the National HCWM Guidelines. In essence, waste segregation and waste color coding work hand in hand. For instance, sharps must be put into a separate containers (preferably sharp boxes) from other hazardous wastes as well as non-hazardous wastes. All waste should be fully inserted into the container with no part sticking out.

A homogenous segregation format must be practiced across all HCF in order to avoid mistakes during recording, collection, storage, transportation and onward treatment. Most waste under the MPA will fall under Classes 1, 2, 3 and 5.

5.1.3 Segregation, Storage and Color Coding for Sharps

It is essential to segregate sharps from other HCW at their point of generation. Sharps boxes, should be used strictly for sharps. Where there is a difficulty in getting sharps boxes, the use of recycled cardboard boxes

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\(^2\) Non Hazardous Waste (Class 1), Infectious Waste (Class 2), Pathological/Anatomical Wastes (Class 4), Pharmaceutical Wastes (Class 5), Highly Infectious Wastes (Class 6), Radioactive Wastes (Class 7), Mercury Wastes (Class 8)
is acceptable if it is puncture resistant, securely in place, easy to insert sharps, contains sharps without risk of spillage, and is well labelled.

No healthcare waste other than sharps should be deposited in sharps containers. When a disposable syringe is used, the packaging should be placed in the general waste bin and the used syringe in the sharps container.

Syringes and needles must be discarded of immediately following use without needles being removed from syringe, recapped, bent or broken before disposal (except where the healthcare facility has appropriate needle cutters/removers in place).

The whole combination must be inserted into the safety box directly after use. If removal of the needle is required, special care must be taken.

5.1.4 Color Coding
Color coding is done by using colors to differentiate waste classes from one other. It is efficient and helps in the process of waste segregation at source. It is also simple, easy to use and thus can be understood even by illiterate patients particularly at rural PHCs where illiteracy level is high. Color coding is one of the efficient ways of achieving segregation of waste and for sorting out items such as paper, plastic, glass and metal for recycling.

It is important that all HCF in Nigeria use the same color coding scheme as this helps to minimize and avoid a waste class from mixing with other waste classes. This is also advocated in the Nigeria National Healthcare Wastes Management Guidelines document.

The recommended color codes and segregation for HCF in Nigeria is shown in Figure 5.1.

As expected, there will be a wider range of waste classes generated at secondary and tertiary healthcare facilities when compared to primary healthcare facilities. Thus is expected that the use of a broader color scheme be applied at the former when compared to the latter. For the sake of uniformity and homogenous color coding for SHC must be an expanded version from that used in the PHCs.
5.1.5 Labelling

An important aspect of color coding is labelling. This particularly helps in rare cases where the same color bags are not available to be used alongside the waste collectors/containers.

All waste bags or containers should be labelled with basic information in English and the local language of the area where the HCF is located. Basic label information should include type of waste in the container; name of the ward/facility, date of collection and, warning of hazardous nature. See Table 5.1 for Labelling tags advocated by the National Healthcare Waste Management Guidelines.

Fig 5.1 Waste Categorization and Color Codes Relevant to Activities of the MPA including IMPACT (In accordance with NHCWMG)
Table 5.1 Recommended Labelling for HCW

<table>
<thead>
<tr>
<th>CLASS</th>
<th>LABELLING</th>
<th>INTERNATIONAL SYMBOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>« Danger! Hazardous infectious waste »</td>
<td><img src="image1" alt="Symbol" /></td>
</tr>
<tr>
<td>2</td>
<td>« Danger! Contaminated sharps, do not open »</td>
<td><img src="image2" alt="Symbol" /></td>
</tr>
<tr>
<td>3</td>
<td>« Danger! Anatomical waste, to be incinerated or deeply buried »</td>
<td><img src="image3" alt="Symbol" /></td>
</tr>
<tr>
<td>4</td>
<td>« Danger! To be discarded by authorized staff only »</td>
<td><img src="image4" alt="Symbol" /></td>
</tr>
<tr>
<td>5</td>
<td>« Danger! Highly infectious waste, to be pre-treated »</td>
<td><img src="image5" alt="Symbol" /></td>
</tr>
<tr>
<td>6</td>
<td>« Danger! Radioactive waste »</td>
<td><img src="image6" alt="Symbol" /></td>
</tr>
</tbody>
</table>

Courtesy: Draft National Healthcare Waste Management Guidelines for Nigeria

It is important for all appropriate boxes/bags (all recommended colors) to the HCFs, and these must be available at the points of wastes generation.

5.1.6 Healthcare Waste Collection

Collection of waste is extremely important particularly to avoid over spilling of waste out of collection containers. Collection must be done promptly and routinely or as often as required. This will reduce the probability of contaminated wastes coming into contact with the public. Collection of waste must be done by approved and trained personnel fully equipped with appropriate PPEs and conveying machinery such as trollies and carts.

Medical staff must be actively involved in collection of waste as should the waste handlers. They should ensure that their containers/bags (Bins/boxes and collection receptacles) are never more than three-quarter full before sealing them at their points of generation. They should also ensure that such collection containers are appropriately labelled.

The following should be adhered to when collecting waste

- A supply of fresh collection bags or containers should be readily available at all locations where waste is produced.
- Containers should be leak-proof and puncture resistant to avoid spillages
- Collection must be done routinely on a daily bases;
- Collection containers should be placed on leak-proof surfaces and in secured locations;
- Collection containers should never be allowed to overflow. This requires prompt and frequent collection;
- Collection containers should be tightly sealed once three-quarters full by tying the neck or sealing tag. Bags should not be closed by stapling;
- Regulations and supervisory arrangements must be set in-place to ensure that personnel utilize PPE when on duty.
- Waste collected must be moved directly to the central temporary storage area;
- Clearly labelled (both in English and the local language) with the name of each waste class. Labelling should include the type of waste in the container, name of the ward/facility, date of collection and warning of hazardous nature;
- Only containers and bags properly labelled should be collected from their points of generation;
- Collection containers must be replaced immediately after collection;
- All waste handlers should wear PPE at all times while on duty; and
- Collection trolleys and carts should be designed to prevent and accommodate any form of spillages. They must also be easy to convey and clean.
- Sealed sharps containers should be placed in a labelled, yellow infectious health-care waste bag before removal from the hospital ward or department.
- Water and hand-wash materials must be readily available for healthcare waste handlers to wash their hands after handling HCW.

### 5.1.7 Waste Storage

Storage refers to the time lapse of the entire process from time of waste generation to the point of collection for final disposal. Consideration for storage must be based on the classification or class of waste being dealt with and the potential risk of infection to health-care workers, waste disposal staff, and the public. The following rules should be observed for proper storage of HCW in Nigeria according to the NHCWM Guideline

- Initial packaging and storage should take place where HCW is generated.
- Storage of waste may then be moved to a temporary on-site storage location
- Non-risk HCW should always be stored in a separate location from the infectious/hazardous HCW in order to avoid cross-contamination

Every HCF must designate an area within its premises where waste can be temporarily stored until final collection for disposal and onward treatment. It is expected that each HCF must manage the HCW it generates. Such a general storage location should be located at the back of the facility and away from the view of the public. The following characteristics are recommended storage locations that deal with infectious and hazardous waste

- Their grounds should be hard, impermeable and with good drainage;
- They should be easy to clean and disinfect with easy access for waste handlers;
- They should be inaccessible to unauthorized persons;
- They must be cordonned off from the public. This is particularly important to prevent waste pickers/scavengers from accessing such areas
- They should have easy access for waste-collection vehicles;
- They should be protected from the sun and inaccessible for animals, insects, and rodents;
- They should have good lighting and good ventilation; and
- They should not be in close proximity to fresh food stores or food preparation areas.
- Convenient to a supply of cleaning equipment, protective clothing, and waste bags or containers.
Healthcare Waste Management Plan (HCWMP) for Improved Child Survival Program for Human Capital MPA

- Provide secured storage with adequate chambers for infectious, non-infectious, and food waste

However in addition to these, it is also important to educate patients who patronize HCF on how to dispose of certain personal wastes. Patients should be encouraged to dispose of their waste in appropriate manners. For instance, when blood samples are taken, cotton wool is usually given to the patient to cover the puncture. Such cotton wool could be contaminated and it is important such a waste is disposed for properly. In this case, it should be disposed of in a yellow bag rather than in a black bag.

### 5.1.8 Transportation

This involves the conveying of waste from the point of generation to point of temporary general storage, treatment or disposal. Transportation of HCW can be divided into two

(a) **Transportation to On Site Storage Location**: This involves conveying of wastes from the various points of generation within a HCF to a temporary storage location also within the same HCF.

(b) **Transportation to Off-Site Disposal/Treatment Location**: This involves conveying wastes both from the temporary on-site location within the HCF and a treatment facility (such as an incinerator) to an off-site location for final disposal.

The following should be adhered to when carrying out **On Site transportation**

- Every effort should be made to avoid unnecessary handling of HCW;
- All waste bags should in-place and intact at the end of transportation;
- Carts, containers, or vehicles used for the transportation of health-care waste should not be used for the transportation of any other material;
- Waste that has the potential to leak must be double bagged;
- Waste bags should be placed in containers (e.g. cardboard boxes or wheeled, rigid, lidded plastic or galvanized bins), before being placed directly into the transportation vehicle.

For off-site transportation, the following should be adhered to

- Vehicles must be easily cleaned and have no sharp edges to damage waste containers.
- Vehicles should be kept locked at all times, except when loading or unloading;
- When transporting hazardous waste, vehicles and containers must be cleaned and disinfected daily with an appropriate disinfectant;
- any vehicle used to transport health care waste should fulfil the following design criteria:
  - Suitable size for the amount of waste;
  - designed such that the load is retained even if the vehicle is involved in a collision;
  - include a system for securing the load during transport;
  - possess a separate compartment in the vehicle for spare plastic bags, suitable protective clothing, cleaning equipment, tools, disinfectant, and “spill,” and,
  - Must be easily cleanable and have no sharp edges to damage waste containers.
- Provide securely designed transport vessel for off-site transport.
CHAPTER 6: HCWMP for the MPA

6.1 HCWMP for the MPA
The HCWMP for the MPA will operate within the confines of the Principles of Waste Management as defined in the National Health Care Waste Management Plan (See Chapter 5). In addition this HCWMP is developed in line with the Environmental, Health, and Safety Guidelines for Health Care Facilities a copy of which can be accessed via [https://www.ifc.org/wps/wcm/connect/bc554d80488658b6b6e6f66a6515bb18/Final%2B-%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&id=1323161961169](https://www.ifc.org/wps/wcm/connect/bc554d80488658b6b6e6f66a6515bb18/Final%2B-%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&id=1323161961169)

For the plan to be effectively implemented, all HCFs in the project states need to develop standardized plans based on their existing needs. Such plans should focus on segregation, treatment, recycling, transportation and disposal options through safe and cost effective treatment and disposal methods.

The plan is expected to build upon previous World Bank projects such as Nigeria State Health Investments Project (NSHIP), BHCPF and Polio additional financing 3 particularly in states participating in these projects. This will avoid an overlap of already existing HCWMP in the states. In addition regular training programs related to HCWMP targeted at the PHC levels should be undertaken once quarterly. This will help build capacity throughout the MPA. See Section 6.4 and Table 6.1.

6.2 Responsibility for Healthcare Waste Management
Responsibilities for waste management are not well defined in most HCFs particularly in the smaller PHCs in remote areas. Most institutions do not have Environmental Health Officers and have delegated this duty to administrative staff.

HCFs should have well organized HCWM procedures with clearly defined HCWM roles. HCWM regulations for hospitals must demand that financial and material resources are made available so that HCWM procedures can be safely and routinely practiced.

In THCs and SHCs, Medical Waste Management Committees should be constituted and should include:
- Chief Medical Officer;
- Head of Hospital Departments;
- Chief Pharmacists;
- Radiation Officer;
- Financial Controllers;
- Senior Nursing Officer/ Head Matron; and
- Hospital Administrator.

In PHCs, HCW Committees should be constituted and should include:
- Senior Nursing Officer/Matron
- Hospital Administrator
- Nurses

Employers (private PHCs) have a number of legal responsibilities which include:
- Developing and maintaining a safe work environment and safe work practices;
- Ensuring that hospital activities complies to state and national environmental standards; and
- Providing staff training and education for the safe handling of health care waste.

Employees also have responsibilities which include:
- Complying with safety instructions and the use of safe work practices for their own protection and for the protection of other staff and the public;
- Actively supporting environmental initiatives introduced by the waste management committee;

In addition patients and visitors would need to have basic knowledge of waste management particularly on segregation and color codes. This can be taught to them by HCF staff or through posters.

### 6.3 Staff and Public Awareness Program

The objective of the staff and public awareness program is to convey information to both staff, public and interested groups. By utilizing a multi-faceted approach to convey information, the success of the effort will be optimized. The staff and public awareness plan describes the general approach and benefits from each element of the program. It includes several media of creating awareness among patients and the public. The plan would be effective since several media would be used as part of a coordinated program.

Although some strategies may be more effective than other elements, combining several techniques and different media in conveying plan/project information to the public would create an optimal approach. The Case Managers Specialists and the SBCC Specialists would play an important role in implementing this.

The following media would be essentially used during the public awareness plan:
- **Newsletters**: Newsletters will be written in major Nigerian languages and would include basic HCW Principles such as Segregation and Color Coding. These should be distributed quarterly throughout the implementation period of the MPA. Each newsletter will explain how the public can provide input into the plan as well as proper ways to dispose HCW. Newsletter should be distributed in HCFs in all project states under the MPA.
- **Posters**: Posters shall be pasted in strategic and conspicuous areas. They should be written in local languages which include basic HCW Principles such as Segregation and Color Coding.
- **Seminars and Workshops**: Seminars/workshops will offer the public an opportunity to listen to the experts on different aspects of the plan. This will offer the public a convenient opportunity to take advantage of this information. Newsletters, website, and press releases will advertise the schedule of seminars/workshops which shall be conducted annually.

### 6.4 Training Healthcare Workers in proper HCWM

In states visited, staff had not undergone in-depth training on HCWM. The only training done in Kogi State was a skeletal training by WHO. However, the NSHIP states had undergone. The entire staff in the facilities
should all be aware of the HCWMP and should have proper training in HCWM procedures. The trainings should include:

- Basic information about HCW and the risks of bad management of HCW;
- Basic information on the facility’s waste management plan;
- Each employee’s responsibility and role in healthcare waste management; and
- Technical instruction on application of the practices described in the health care waste management plan.

The HCWMP should be presented in a simple and easily understandable format (with diagrams) and displayed at all departments/units of the HCFs or conspicuous areas of the HCFs. Health Care Waste handlers for the facilities should be educated on the appropriate health and environmental working conditions for waste management. This should include the use of PPE and specialized equipment to ensure worker safety as well as safety for the general public.

Trainings should be targeted at the groups of people listed under section 6.2. See Table 6.1 for training
Table 6.1 Trainings and Schedule for Staff and Support Staff in Participating States

<table>
<thead>
<tr>
<th>CAPACITY NEEDS</th>
<th>TOPIC AND CONTENTS</th>
<th>TARGET PARTICIPANT</th>
<th>DURATION</th>
<th>RESOURCE PERSON</th>
<th>ESTIMATED COST (USD)</th>
<th>ESTIMATED COST (NAIRA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic knowledge about HCW</td>
<td>• Waste categories and why they are treated separately and differently;</td>
<td>all categories of persons listed under Section 6.2</td>
<td>½ day</td>
<td>NMEP, SMEP and HCWM consultant</td>
<td>5,000</td>
<td>1,800,000</td>
</tr>
<tr>
<td></td>
<td>• Hazardous potential of certain waste categories;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Transmission of hospital acquired infection; and</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Health risk for health care personnel.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Principles of HCWM and they should be adhered to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper behavior of waste generators</td>
<td>• Environmentally sound handling of residues;</td>
<td>all categories of persons listed in primary and secondary groups under Section 6.2</td>
<td>½ day</td>
<td>NMEP, SMEP and HCWM consultant</td>
<td>5,000</td>
<td>1,800,000</td>
</tr>
<tr>
<td></td>
<td>• Waste avoidance and reduction possibilities;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Identification of waste categories;</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>• Separation of waste categories; and</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Knowledge about appropriate waste containers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper handling of healthcare waste</td>
<td>• Adequate waste removal frequency;</td>
<td>all categories of persons listed under Section 6.2</td>
<td>1 day</td>
<td>NMEP, SMEP and HCWM consultant</td>
<td>5,000</td>
<td>1,800,000</td>
</tr>
<tr>
<td></td>
<td>• Safe transport containers and procedures;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Recycling and re-use of waste components;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Safe storage of wastes;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Handling of infectious laundry;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Handling of chemical and radioactive waste, outdated drugs;</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Safety regulation in waste management, protective clothing; and</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Emergency regulation in waste management.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Establishing a HCWMP</td>
<td>• Establishment and implementation of a waste management plan;</td>
<td>all categories of persons listed under Section 6.2 excluding Patients and visitor</td>
<td>1 day</td>
<td>NMEP, SMEP and HCWM consultant</td>
<td>5,000</td>
<td>1,800,000</td>
</tr>
<tr>
<td></td>
<td>• Sampling of waste quantities, monitoring, and data collection;</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>• Monitoring and supervision of waste management practices;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cost monitoring of waste management;</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Establishment of a chain of responsibilities;</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Set-up of occupational safety and emergency regulations;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establishing a HCW maintenance plan</td>
<td>• Cleaning, maintaining of collection, transportation, storage facilities;</td>
<td>all categories of persons listed under primary group under Section 6.2</td>
<td>½ day</td>
<td>NMEP, SMEP and HCWM consultant</td>
<td>5,000</td>
<td>1,800,000</td>
</tr>
<tr>
<td></td>
<td>• Maintenance and operation of incinerator for infectious wastes;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Maintenance of septic tanks and other sewage treatment facilities; and</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Maintenance and operation of waste pits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25,000</td>
<td>9,000,000</td>
</tr>
</tbody>
</table>
6.5 HCW Treatment Process for MPA
The following plan should be adopted during the MPA and is based on the present status of incinerators across the participating states. In addition, one of the requirements for states to meet should be provision of at least 2 incinerators. For states that do not have incinerators, other acceptable modes of HCW treatment have been provided under Section 6.6.

Two treatment processes have been proffered based on the availability of incinerators

Treatment Process 1: States without functioning Incinerators

Of primary concern is the treatment of sharps (Class 3)

6.6 HCW Treatment for MPA by Waste Class
The following are recommended treatment options according to the NHCWMG and should be adopted for the MPA. In addition, the World Bank Group’s Environmental Health and Safety Guidelines should also be

*Non Hazardous Waste (Class 1):* Could be separated from other HCW and disposed of along with other MSW.

*Infectious Waste (Class 2):* Infectious HCW shall be incinerated in high-temperature, double chamber incinerators. In primary health centers, infectious waste may be burnt and buried in a protected pit when there is no risk of contaminating underground water. Infectious waste pits must be fenced to prevent access.

*Sharps (Class 3):* Sharps should undergo incineration whenever possible. Where this is not possible, they should be encapsulated and then land filled, or buried in specially constructed sharps pits. Based on the current unavailability of functioning incinerators, two treatment options should be used

- **Option 1:** For states with functioning incinerators, sharps should be stored temporarily in HCFs and transported at least twice a month to the central location (preferably the Local Government Area Council office) for onward transportation and treatment at the pre-determined incinerator. After burning of the sharps at the central incinerator, the ashes should be taken to an approved landfill. Each HCF must have a designated temporary storage area which must be cordoned off from easy access by rodents and unauthorized persons. Provisions for the transportation of the sharps to the central location should be provided by the project through the NPHCDA.

- **Option 2:** For states without functioning incinerators, sharps should be encapsulated. Particularly for rural HCF that generate small HCW by volume. Full safety boxes should be closed and put into high density plastics or metal containers. When the container is full, an immobilizing agent such as cement, plastic foam, sand or clay is added. When the immobilizing material has dried, the containers are sealed and disposed of in the approved landfill site or left in place if they are constructed in the ground. They can also be buried within the HCF premises. See Annex 5. Using this method reduces to a great extent the possibilities of waste pickers being infected by the sharps as contact is reduced.
Pathological/Anatomical Wastes (Class 4): Pathological and anatomical waste can be treated by pyrolitic incineration. Low-temperature, artisan incinerators must not be used for large amounts of pathological waste. Anatomical waste and placetas can be buried at a sufficient depth (greater than 1 meter) inside the HCF compound. If transportation and disposal cannot be immediately ensured, anatomical waste should be stored in the mortuary.

Pharmaceutical Wastes (Class 5): High temperature incineration is the best way to dispose of pharmaceutical waste. The waste should be disposed of with their cardboard packaging to ensure optimal combustion conditions. Low-temperature incineration (<800°C) is not recommended. Cement kilns are particularly well suited for the treatment of pharmaceutical waste since the temperatures reached often exceed 1,200-1,400°C, thus ensuring both complete combustion and near to zero toxic exhaust gases.

Small quantities of pharmaceutical waste may be encapsulated (can be mixed with sharps), buried, land filled (provided that they are dispersed in large quantities of general waste). Cytotoxic, antibiotics, or narcotic drugs, however, should never be discharged into the sewer or land filled, even in small quantities.

PHC that cannot treat Class 5 wastes in accordance with the above can return the expired drugs, vaccines to their SMoH for onward treatment and disposal as is currently being practiced in some states.

Highly Infectious Wastes (Class 6): Whenever possible, highly infectious waste should be sterilized by autoclaving at the earliest possible time, before being disposed of with medical waste. This is not feasible in most Nigerian healthcare facilities thus, it is recommended that, a chemical pretreatment in a concentrated solution of sodium hypochlorite prior to disposal with other clinical wastes.

Radioactive Wastes (Class 7): All radioactive waste shall be stored to allow decay to background level. They shall be placed in a large container or drum and labelled with the radiation symbol showing the radionuclide’s activity on a given date, the period of storage required, and marked “caution! Containers or tanks with radioactive waste that have not decayed to background level, shall be stored in a specific marked area, preferably in a lead shielded storage room or alternatively in a room with concrete walls 25cm thick.

Non-infectious radioactive waste, which has decayed to background level, shall follow the non-risk HCW stream (Class 1) while infectious radioactive waste which has decayed to background level shall follow the hazardous HCW stream (class 2). Liquid radioactive waste shall be discharged into the sewerage system or into a septic tank only after it has decayed to background level in adequate tanks.

Mercury Wastes (Class 8): This should be treated as a specialized kind of waste and should be collected and stored in a tin container at room temperature and transported to where it will be treated in an environmentally sound manner. Effort should be made at facility levels to discontinue the use of mercury containing devices.

6.7 Waste Disposal
Dispensation is the final location of treated HCW. The safest disposal method for treated health care waste (e.g incinerator ash, sterilized, disinfected infectious waste, encapsulated radioactive waste) is controlled disposal at a properly engineered sanitary landfill to be designated and monitored by the relevant authority, such as FMEnv. Other waste such as human parts may be buried directly at cemeteries or sent for cremation.
The treated hazardous waste to be disposed of shall not be mixed with the general municipal waste;
disposal should comply with the basic principles of sanitary landfill operations;
proper and effective disposal of HCW is dependent on adequate financing and budgeting; and
technically sound and knowledgeable personnel and disposal equipment must be readily available.

### 6.8 Annual Indicative Cost for Implementing the HCWMP

The indicative cost of implementing this HCWMP is calculated on per annum bases for all 24 project states
based on an average of 50 HCFs per state. Based on this premise implementing the HCWMP for the MPA
would cost One Hundred Forty Four Thousand Three Hundred and Sixty Four Dollars Only (Fifty One Million
Nine Hundred Seventy One Thousand Forty Naira Only). Table 6.2 shows the indicative cost for
implementing the HCWMP for MPA.

#### Table 6.2: Annual Indicative Cost for Implementing the HCWMP for the MPA

<table>
<thead>
<tr>
<th>S/N</th>
<th>ACTIVITY</th>
<th>INSTITUTION RESPONSIBLE</th>
<th>COSTS (USD)</th>
<th>COST (NAIRA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Provision of appropriate collection, storage and segregation bags_containers, sharp boxes at HCFs</td>
<td>NMEP, SMEPs, NSC, NPHCDA, SPHCDCA.</td>
<td>39,360</td>
<td>14,169,600</td>
</tr>
<tr>
<td>2</td>
<td>Supply/provision of PPEs for HCFs (coveralls, nose guards, gloves, etc)</td>
<td>NMEP, SMEPs, NSC, NPHCDA, SPHCDCA.</td>
<td>48,000</td>
<td>17,280,000</td>
</tr>
<tr>
<td>3</td>
<td>Public Disclosure</td>
<td>See ESMF prepared for this MPA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Training</td>
<td>See Table 6.1</td>
<td>25,000</td>
<td>9,000,000</td>
</tr>
<tr>
<td>5</td>
<td>Monitoring and Evaluation</td>
<td>See Table 6.1</td>
<td>18,880</td>
<td>6,796,800</td>
</tr>
<tr>
<td></td>
<td>Sub-Total</td>
<td></td>
<td>131,240</td>
<td>47,246,400</td>
</tr>
<tr>
<td></td>
<td>Contingency (10% of Sub-total)</td>
<td></td>
<td>13,124</td>
<td>4,724,640</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td>144,364</td>
<td>51,971,040</td>
</tr>
</tbody>
</table>
CHAPTER 7: Monitoring & Evaluation

Monitoring is required to follow-up on decisions made to intervene in various activities of HCWM in order to protect human health as well as the environment. This can be achieved through periodic internal and external processes of monitoring and evaluation on a continuous basis, at the HCFs. In this way management will be able to assess compliance with regulatory requirements at national, state and local levels.

To ensure that the objectives of this HCWMP are achieved, the implementation of the plan will be monitored by both internal and external bodies including the SMEnv as well as SMEP and the SPHCDA.

7.1 Monitoring and Evaluation Objectives

The aim of the M&E is to establish suitable criteria for addressing potential negative impacts of HCW and to ensure that unforeseen impacts are detected and subsequently adequate mitigation measures are implemented at an early stage. Specific objectives of the monitoring plan are to:

- Ensure that any additional impacts are addressed appropriately;
- Check the effectiveness of recommended action plans and mitigation measures;
- Ensure that the proposed mitigation measures are appropriate;
- Demonstrate that health care waste management is being implemented according to plan and existing regulatory procedures; and
- Provide feedback to implementing agencies in order to make modifications to the operational activities where necessary.

7.2 Monitoring Indicators

Waste management requires constant monitoring and involvement by all staff and visitors to HCF. The monitoring of HCWM is part of the overall quality management system. To measure the efficiency of the HCWMP, as far as impacts and reduction of infections are concerned; activities should be monitored and evaluated using indicators and this should be done in collaboration with concerned institutions including the FMoH, SMoH, NPHCDA, NERICC, SERICC, etc. Specific monitoring indicators for consideration are shown in Table 7.1

Monitoring and evaluation shall be carried out quarterly by the various State Primary Healthcare Development Agencies (SPHCDAs). This shall be carried out using the form in Table 7.1. Each parameter shall be scored 0, 1 or 2 on the bases on their observable adherence with each parameter where

- 0 = poor (signifying there is adherence with the parameter)
- 1 = average (there is some sort but not full adherence with the parameter)
- 2 = good (there is full adherence with the parameter)

At the end the points should be summed up and any HCF scoring less than 31 (that is 45% of the maximum possible score of 70) will be ranked as poor in terms of HCWM while those scoring above 52 (that is 75% of the maximum possible score) shall ranked good. For HCF scoring between 31.6 and 52.4 (that is 46% and 75% of the maximum possible scores respectively), shall be ranked as average.
### Table 7.1 Measureable Indicators and Evaluation

<table>
<thead>
<tr>
<th>No</th>
<th>PARAMETER</th>
<th>GRADING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0 1 2</td>
</tr>
<tr>
<td>1</td>
<td>General Cleanliness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Containers not overfull</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No used sharps outside or extending out of sharp boxes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No HCW litter in the HCF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Waste pits not overfull</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No foul smelling waste in HCF</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>HCW Management Structure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is the HCWMP in place</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is waste minimization being practiced at source of generation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are standard hygiene such as sanitizers in place</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there HCWM awareness of staff</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are there color bin bags, liners, sharp boxes available</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are records of waste generated being kept</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there a dedicated budget for HCWMP including for off-site transportation</td>
<td></td>
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<tr>
<td></td>
<td>Are there clearly defined roles and responsibilities assigned to relevant staff</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are training on awareness and HCW carried out</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is HCW being treated according to the outlined treatment options in the HCWMP</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>HCW Collection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do staff use PPE when handling HCW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is waste being segregated at points of generation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are bin color bag/liners labelled properly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are there adequate collection containers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is the frequency of waste removal adequate and regular</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there a responsible staff for waste collection within the facility</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>HCW Storage On Site</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there a dedicated area for HCW storage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are the storage centers/facilities clean</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there a separate storage for sharps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there any emergency equipment/medication such as Post-Exposure Prophylaxis (PEP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are on-site storage centers secured and cordoned from the public</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there a responsible staff for managing the on-site storage area</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Transportation Off Site</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is transportation means save and secured (covered)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there a dedicated staff responsible for overseeing transportation off site</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there appropriate paper work and records documented during transportation</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>HCW Treatment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there a treatment facility onsite such as a pit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is the open Pit for burning general waste only</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Open pit well maintained</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Limited human traffic close to pit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is the pit design and structure in line with the specifications in the HCWMP</td>
<td></td>
</tr>
</tbody>
</table>

**SCORING**

* 0 = poor (signifying there is adherence with the parameter)
* 1 = average (there is some sort but not full adherence with the parameter)
* 2 = good (there is full adherence with the parameter)

*The maximum possible score is 70

**RATING**

* Poor: 31 and below
* Average: Above 31 and not more than 52
* Good: Above 52
7.3 Monitoring Plan

An effective control of HCW and monitoring of facilities should be carried out regularly, in order to maintain and improve HCWM. Measures should be adopted to ensure that problems and risks involved are identified while enhancing safety and preventing the development of future problems.

Compliance and enforcement with legislation shall be ensured through co-coordinating and regulatory bodies. These bodies should include FMEnv, SEPAs, NMEP, SMEPs, Secretariat of the NSC, NPHCDA, SPHCD. They shall undertake regular monitoring of HCF, with the aim of establishing long-term sustainability in HCWM.

Monitoring shall ensure compliance with the following:

- Segregation i.e. sharps, pathological, hazardous and radioactive waste from other waste. Picture stickers shall be used in rural areas for identification;
- Storage into appropriate, labelled and adequate containers for both internal and external storage;
- Collection routines including packaging and labelling;
- On-site treatment procedures like sterilisation, disinfection and incineration. It should be ensured that the incinerator plant continually burns its materials at a temperature of not less than 1200°C to eliminate the release of dioxins;
- Transportation i.e. means of transportation;
- Worker safety measures such as availability and usage of PPEs; and
- Appropriate disposal techniques and approved disposal sites.

To ensure effective record keeping, each HCF shall keep records on:

- The type and volume or weight of health care waste generated;
- The means of transportation, type and volume transported;
- Commissioned waste contractor (company name, type of license; and
- Disposal method(s) - volume incinerated, volume treated and disposed.

See Annex 6 for Sample of record keeping form

Table 7.2 Annual Indicative Cost of Monitoring Plan

<table>
<thead>
<tr>
<th>S/N</th>
<th>WHAT IS BEING MONITORED</th>
<th>WHY</th>
<th>WHEN</th>
<th>HOW</th>
<th>INSTITUTION RESPONSIBLE</th>
<th>COST (USD)</th>
<th>COST (NAIRA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HCWM Monitoring and evaluation program</td>
<td>To check effectiveness and gaps</td>
<td>Monthly</td>
<td>Verification of monitoring and evaluation program reports</td>
<td>HCF, NMEP, SMEP, NPHCDA, SPHCD, NSC, Local Authorities</td>
<td>12,000</td>
<td>4,320,000</td>
</tr>
</tbody>
</table>
| 2   | HCWMP implementation  
- Trainings  
- Use of SOPs and PPEs  
- Transport and Disposal  
- Treatment of HCW | To verify if HCWMP is being implemented, and to check implementation progress. | Bi-annual | Organized supervisory missions; stakeholder conference meetings | HCF, NMEP, SMEP, NPHCDA, SPHCD, NSC, Local Authorities | 2,880 | 1,036,800 |
<table>
<thead>
<tr>
<th></th>
<th>Social accountability and community perceptions</th>
<th>To ascertain social accountability</th>
<th>Bi-annual</th>
<th>Organized supervisory missions</th>
<th>HCF, NMEP, SMEP, NPHCDA, SPHCDA, NSC, Local Authorities</th>
<th>4,000</th>
<th>1,440,000</th>
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</thead>
<tbody>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>18,880</strong></td>
<td><strong>6,796,800</strong></td>
</tr>
</tbody>
</table>
CHAPTER 8: Stakeholders Consultation

8.1 Objectives
Consultations are conducted to ensure the project is carried out effectively within budget and agreed timelines and to make certain all stakeholders are involved in the process of implementing the HCWMP for the MPA. This helps develop adequate knowledge of the project and creates a sense of ownership by the stakeholders.

The following principles should be at the forefront when carrying out consultations:

- Promotion of easiest means and modes of communication;
- Openness to the true state and plan of the MPA;
- Ensuring effective and deep rooted involvement of all stakeholders in the development of the project;
- Helping and increasing relevant stakeholders understanding of the project, project goals and the implementation processes;
- Using all strategies and techniques that provide prompt and adequate opportunities for all stakeholders to get involved in the project;
- Evaluating the effectiveness of the engagement plan against the expected outcomes; and
- Continuous consultation throughout the life cycle of the project.

8.2 Summary of Outcome of Stakeholders’ Consultation
A stakeholders’ consultation was held on 13 September 2018 in Newton Park Hotel, Wuse 2, Abuja. In attendance included representatives from the FMOH, SMoH, NMEP, AfDB and IsDB all SMEP excluding Ondo State. Also in attendance was the PM of IMPACT. See Annex 8a for the attendance sheet.

Table 8.1: Summary of the Outcome of Stakeholders Consultation held on September 13, 2018

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>Date of</td>
<td>13 September, 2018</td>
</tr>
<tr>
<td>Stakeholders</td>
<td>NMEP, SMEP, SMoH, AfDB, IsDB</td>
</tr>
<tr>
<td>Language</td>
<td>English</td>
</tr>
<tr>
<td>Introduction</td>
<td>The consultant explained to all stakeholders the World Bank Safeguards Policies as they relate to the MPA. He also explained the importance and why the WB is preparing this HCWMP prior to the start of the project. He explained the scope of the HCWMP and why it was very important to carry out the stakeholders consultation early in this project. He also explained that the HCWMP would have to be disclosed as is required for Category B projects under the EIA Act - CAP. E12 L.F.N. 2004.</td>
</tr>
</tbody>
</table>
| Concerns/Complaints/Remarks/Recommendations | The stakeholders explained that they would be concerns over the management of HCW in their various states
- All stakeholders were particularly concerned about the time before commencing on the project
- They sought clearance on how the HCWMP would be disclosed and the roles each SMEP and NMEP would be required to play to achieve early Disclosure
- After seeking clarifications on the Public Disclosure process, the NC of NMEP expressed determination to facilitate the Disclosure as soon as possible.
- It was suggested that a HCWMP be prepared for the MPA to assist in managing the HCW that would be generated as a result of the project activities. |
8.2 Outcome and Summary of State/Field Visits

Field visits were also undertaken to selected states to ascertain and create awareness towards the project, determine the current HCWM practices and the HCF level considering that these are the major environmental and social risks and impacts identified under the MPA. Targeted stakeholders included the SMEP, SPHCDAs and SERICCs. Other targeted stakeholders included the State Immunization Officers (SIOs), Local Immunization Officers (LIO), and the CMOs and staff at some selected HCFs. See Pics 8.1 to 8.6.

Benue and Kogi State were chosen for field visits. These sample states were chosen because Kogi State is participating in both the malaria and immunization programs under the MPA and has also been participating in the National Polio Eradication Support Project AF3 (NPESP AF3) while Benue State was chosen because it is yet to be a part of a World Bank financed project in the health sector. Consultations in Kogi and Benue States took place between 14 to 15 March, and 4 to 5 April, 2019 respectively. See Tables 8.2. The visits revealed similar practices, constraints and concerns. See Table 8.2.

<table>
<thead>
<tr>
<th>VISIT TO BENUE AND KOGI STATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITEMS</td>
</tr>
<tr>
<td>Date of Public consultation</td>
</tr>
<tr>
<td>Stakeholders</td>
</tr>
<tr>
<td>Language</td>
</tr>
<tr>
<td>Introduction</td>
</tr>
</tbody>
</table>
| General Remarks and Observations | ▪ There was little awareness of the MPA  
▪ However, all invited stakeholders expressed acceptance and willingness to ensure the project is sustainable and implemented in their states. | ▪ There was little awareness of the MPA, however, all invited stakeholders expressed acceptance and willingness to ensure the project is sustainable and implemented in their states. |
The state admitted they have serious challenges with HCW and its management. Most staff showed awareness on the classes of HCW they generate and also on color coding. Four incinerators have been installed in the state (Gboko, Makurdi, Otukpo and Katsina Ala) but are not functioning and can only burn plastics (syringes) but not sharps (needles). A fifth incinerator in Oju LGA burns only about 100 safety boxes a day. Sharp boxes have been stored at LGAs for about a year without treating or onward disposal. Limited training have been carried out by organizations such as WHO and USAID.

### VISITS TO SELECTED HCFs IN BENUE AND KOGI STATE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Public consultation</td>
<td>Between April 4 and 5, 2019</td>
</tr>
<tr>
<td>Stakeholders</td>
<td>CMO and staff at HCF including Nurses</td>
</tr>
<tr>
<td>Current State and Practice</td>
<td>The general management of sharps is for the HCFs to transport all filled safety boxes to the LGA headquarters weekly from where it is taken to an incinerator. In all HCFs visited, segregation is practiced at the generation point however, only the sharps are transported out of the HCF to the LGAs while all other wastes are lumped together and burnt in either a pit or on open grounds after which it is buried or evacuated. In most HCFs visited, areas used to burn wastes are not cordoned off and are extremely accessible to the public. See Pics 8.1 and 8.2. Labelling of HCW was not practiced at any of the HCFs visited. There is no designated officer in charge of HCW at any HCF. There is no record of HCW or a manifest and there are no monitoring plans addressing HCWM. All HCFs lack IEC materials and posters. There is no dedicated budget to address HCWM at the HCFs. Class 5 wastes (drugs, pharmaceuticals) are returned to the SMoH.</td>
</tr>
<tr>
<td>Concerns/Complaints/Remarks/Recommendations</td>
<td>There is little finance particularly when it comes to transporting Class 3 wastes (Sharps) from the HCFs to the LGAs. There is no training structure on HCWM at the HCFs in the state. Most staff are aware of the National Healthcare Waste Management Plan and Guidelines but have not seen it or been trained on it.</td>
</tr>
</tbody>
</table>
Healthcare Waste Management Plan (HCWMP) for Improved Child Survival Program for Human Capital MPA

Pics 8.1: Visit to FSP Agan, Benue State (Picture taken April 4, 2019)

Pics 8.2: Stakeholders’ Consultation at PHC Adankolo, Kogi State (Picture taken March 14, 2019)

Pics 8.3: Open and exposed area where HCW is burnt at PHC Asase, Benue State. (Picture taken April 4, 2019)

Pics 8.4: Open and exposed pit (showing sharp box) where HCW is burnt at PHC Wadata, Benue State. (Picture taken April 4, 2019)

Pics 8.5: Visit to PHC Adankolo, Kogi State (Picture taken March 14, 2019)

Pics 8.6: Open and exposed Pit where HCW is burnt at PHC Old Market, Kogi State. (Picture taken March 15, 2019)
ANNEX 1: Terms of Reference

Consultant Assignment to Prepare an Healthcare Waste Management Plan (HCWMP) for NIGERIA CUTTING UNDER FIVE MORTALITY RATE BY FIFTY PERCENT IN A DECADE (U5MR)

BACKGROUND AND PROJECT DESCRIPTION
The Federal Government of Nigeria (FGON) in collaboration with the World Bank is currently implementing the Nigeria Cutting Under Five Mortality Rate By Fifty Percent In A Decade (U5MR).

Under the U5MR, the World Bank will support the expansion and strengthening of preventive and curative services; strengthening of the health systems and capacity building as well as engagement of communities while encouraging community learning of heath related matters.

The under-five mortality rate (U5MR) in Nigeria is high, especially by comparison to other lower-middle income countries. A poor child in Nigeria faces the highest risk of dying before her/his fifth birthday in all West Africa. Almost 75% of U5MR in Nigeria, excluding neonatal mortality, is due to 3 diseases: malaria, pneumonia, and diarrhea. Controlling these diseases requires both preventive and curative services, the coverage of which are variable. Immunization coverage is the lowest in West Africa, especially for poor children. Thus, reducing U5MR is not just about improving welfare, it is also a crucial contributor to economic growth and an inherent part of its human capital development. Reducing U5MR will therefore have important economic benefits including human capital formation. Besides simple welfare effects, reducing U5MR will have important socio-economic benefits for Nigeria, including

(i) Cognitive Development: Improved child health has an important influence on the cognitive development. Preventing illnesses in young children and treating them effectively when they do get sick is an important part of human capital development.

(ii) Nutritional Effects: Children who are frequently sick are also at high nutritional risk. Breaking this vicious cycle is an important aspect of human capital formation.

(iii) Fertility reduction: There has never been a significant reduction in fertility that wasn’t preceded by a steep reduction in U5MR. Since reducing U5MR is critical to fertility reduction, it also an essential aspect of obtaining a demographic dividend.

(iv) Reduction in Child Mortality have preceded economic take-off: Whether they are causal or not, improvements in child mortality preceded the economic take-off observed in East Asian “tiger” economies. Waiting for economic growth to improve child health has not worked in Africa and goes against the experience in East Asia.

All these (i-iv above) will enhance and culminate in economic growth.

PROPOSED PROGRAM DEVELOPMENT OBJECTIVE (PDO)
The objective of the program is to reduce under 5 mortality rate in Nigeria by 50% over the next decade.

The Components for the U5MR are:

Component 1: Expanding and Strengthening Preventive and Curative Services Through NSAs ($120 million)
The project will finance contracts with NSAs to:

(i) Provide LLINs to households and ensure nets are hung and used;

(ii) Strengthen the management of sick children, including those with malaria, in both the public and rural private sectors;

(iii) Distribute Sulfadoxine-Pyrimethamine (SP) to pregnant women during Antenatal Care through both the public and rural private providers;

(iv) Provision of SMC to children under 5 in selected Sahelian states;

(v) Interpersonal behavior change communication to improve behavior and knowledge in rural communities; and

(vi) Commodity procurement and supply chain management.

Component 2: Health System Strengthening and Capacity Building ($20 million)
The project will support the health system and strengthen capacity at federal and state levels in the following ways:

(i) Strengthening monitoring and evaluation through the following
(a) Establishment of a sample registration system (SRS) in conjunction with the appropriate federal government agency to provide estimates, by geo-political zones of U5MR, neonatal mortality, maternal mortality, total fertility rate, and causes of under-five deaths;
(b) Conducting special household surveys to help assess the performance of the NSAs;
(c) Carrying out detailed assessments of private and public-sector knowledge of management of sick children, including those suffering from fever.

(ii) Provision of performance-based technical support to the state malaria elimination programs (SMEPs) and the national malaria elimination program (NMEP) to help manage contracts, assess performance, improve management and supervision, and make strategic decisions on malaria control. The technical support will also include:
(a) Training of key state officials in performance and contract management;
(b) Use of performance frameworks for key state and national level staff to incentivize critical actions; and
(c) Organizing annual or semi-annual results conferences that bring together all states to learn from their implementation experience.

Component 3: Community Engagement and Learning ($10 million)
The project will finance activities related to community engagement and learning, including:
(i) Conduct of qualitative assessments and operational research to improve program performance;
(ii) Holding regular conversations and receiving feedback from beneficiaries about the services they receive;
(iii) Recruitment of a firm/organization to implement SBCC activities at national and state levels including through mass media and, mosques and churches; and
(iv) Audit of the Government’s Grievance Redress Mechanism (GRM).

A. OBJECTIVES OF THE ASSIGNMENT
The Consultant will support the health team to develop the Healthcare Waste Management Plan (HCWMP).

The objective of the HCWMP is to provide processes that the implementing agencies (Federal, States, Local Government Authorities, and Healthcare Facilities Managements) will follow to ensure the protection of healthcare workers, wastes handlers, and the community from the harmful impacts of infectious hazardous healthcare wastes and to maximize project compliance with international and national environmental regulations and best practices.

As with Nigerian EIA Law and World Bank Disclosure Policy, it is expected that the HCWMP and other relevant instruments that may be required at different stages of this project be disclosed in country and at the Bank’s Info shop before specific works could commence.

B. RATIONALE OF A HCWMP
Based on the anticipated environmental and social impacts associated with this project (including subprojects), the U5MR has been classified as a Category II project under the Nigerian Environmental Act or a Category B under the World Bank’s Operational Policy on Environmental Assessment (OP/BP4.01).

The activities of the U5MR are expected to see the procurement of drugs (Sulfadoxine-Pyrimethamine [SP]), LLIN etc under Component 1. This will see an increase in waste generation particularly from used and expired LLIN, vaccines etc. Concerns thus exist over the management of this increase in waste generation associated with activities of the U5MR.
To address such concerns, a HCWMP is to be prepared in compliance with the World Bank EA requirements on projects for World Bank financing to help ensure that they are environmentally sound and sustainable.

C. SCOPE OF WORK
The consultant is expected to prepare a Healthcare Waste Management Plan (HCWMP) for the Nigeria Cutting Under Five Mortality Rate By Fifty Percent In A Decade (U5MR).

The Consultant is expected to liaise with the health team in order to understand the project coverage in Nigeria and with particular references to participating states in Nigeria. S/he will need to work closely with the health team and other relevant stakeholders associated and linked to the project to achieve the aforementioned.
In addition the consultant will facilitate the Public Disclosure of the HCWMP with the Federal Ministry of Environment.

D. CORE TASKS FOR THE CONSULTANT

The consultant will be tasked with reviewing all available documentation from the sector to develop a Health Care Waste Management Plan (HCWMP). Specific tasks may include the following:

1. Reviewing all available existing documentation of the NSHIP, BHCPFP, NPESP AF3 including the draft project paper, all relevant prepared and disclosed safeguards documents;
3. Review the National Health Care Waste Management Plan for HIV/AIDS and NSHPIC projects
4. Examine coregent practices with regard to the handling of hospital wastes
5. Draft and submit a final HCWMP for review to the TTL

E. QUALIFICATION AND EXPERIENCE

The consultant is expected to have previous experience in the preparation of Technical instruments/documents recognized by the World Bank. Strong country knowledge, knowledge of World Bank Safeguard Policies, Participation in World Bank Orientation on Safeguards Supervision for Consultants.

Consultant’s qualification

a) Degree in Medical Sciences or Environmental Sciences or any other science course
b) M.Sc in any of the following disciplines
   o Public Health
   o Environmental Management
   o Or any other relevant discipline
c) Good knowledge of the healthcare waste streams generated in Nigeria.
d) Good technical and organizational background in performing Healthcare Waste Management programs and projects.
e) At least 5 years working experience in Nigeria or in a developing country under similar projects
f) At least 5 years’ experience of working with communities and working on stakeholder engagement and management
g) Ability to cooperate and interact with stakeholders including facilitating meetings and workshops.
h) Ability to assess complex situations, identify critical issues, and derive appropriate conclusions and adequate recommendations.
i) Experience in developing training manuals or other training documents for programs/projects funded by multilateral agencies specifically on Health Care Waste Management.

F. DURATION OF CONSULTANCY

The study is expected to be completed in 4 weeks.

G. DELIVERABLES AND TIMING

<table>
<thead>
<tr>
<th>Activities</th>
<th>Week 1</th>
<th>Week2</th>
<th>Week3</th>
<th>Week4</th>
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</thead>
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<tr>
<td>Contract Signing</td>
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<tr>
<td>Submission of Draft Reports</td>
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<td>Submission of Final Reports</td>
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</tbody>
</table>

H. REPORTING

The Consultant will report to the TTL of the Nigeria Cutting Under Five Mortality Rate By Fifty Percent In A Decade (U5MR).
ANNEX 2: General Healthcare Waste Treatment Options

HCW Waste Treatment

Proper treatment and disposal of healthcare waste is necessary to ensure that its impact on the environment and human health is minimized or eliminated. Unfortunately, environmental-friendly, safe and affordable options for treatment and disposal are not readily available for every situation in Nigeria.

The first step in HCWM is to ensure that all non-risk (general) waste is safely sent to the municipal waste management system. The remaining fraction of hazardous and highly hazardous health care waste should be treated and disposed appropriately to meet the following objectives:

- destruction of viable infectious organisms
- destruction/transformation of used or expired pharmaceuticals and chemicals
- destruction of sharps and other materials capable of causing physical injuries
- decomposition of radioactive waste materials
- final disposal / destruction of body parts, tissues, blood and other organic material
- avoidance or minimization of secondary impacts from the disposal system

Decisions regarding treatment technology should be made at hospital level; however responsible personnel for waste management in the hospital should be in close contact with the regulatory/supervisory authority.

- All non-hazardous HCW not designated for recycling should be collected and managed with the general municipal waste.
- Burning in low temperature incinerators, preferably a well-designed, constructed and managed Monfort Waste Disposal Unit (DWDU) – is satisfactory whenever this can be made available for a primary health center and even for some secondary healthcare facilities. However, this option is not satisfactory environmentally, and should only be considered a short-term solution to HCW treatment.

Centralized Incineration

- Treatment in a centralized Rotary Kiln Incinerator with good emissions management system, situate in a Tertiary or big secondary healthcare facility (or run by a private waste management firm/Public-Private partnership arrangement) in the region; with HCW collection by a HCWM contractor or public collection system in the opinion of the Consultant, would be the ideal option for the management of HCW from primary and secondary healthcare facilities in Nigeria. This approach would reduce health and environmental pollution risks that would arise from several inefficiently managed and run incinerators or burning pits/burials pits. The major drawback of this approach is that it will take some time to put in place, is expensive to set-up, and will require a transportation infrastructure that is well organized. But once the initial problems associated with
setting up the system are overcome, it should run smoothly, especially if a public-private arrangement for the management of the incinerator is achieved.

**Waste Treatment in Secondary Healthcare Facilities:**

**Treatment in a Centralized Incinerator**
- As with primary healthcare facilities above, sending the HCW from a secondary healthcare facility for treatment in a centralized dual chamber, semi-pyrolytic (preferably a rotary kiln) incinerator, operating at temperatures above 1000°C in the primary chamber and 1200°C in the secondary chamber and incorporating a good emissions management system, situate in a Tertiary or big secondary healthcare facility (or run by a private waste management firm/Public-Private partnership arrangement) in the region would be the ideal option.

The advantages in choosing off-site centralized HCW treatment solutions are:
- **Financial:** greater cost-effectiveness can be achieved in larger units unless the running costs for waste collection and transportation remain too expensive;
- **Technical:** efficient operation and maintenance of units is easier to ensure in a centralized facility than in several plants where financial and human resources may not be readily available;
- **Legal compliance:** conformance to environmental norms are easier to achieve, thanks to the use of more sophisticated/expensive technology and by the reduced number of facilities that need to be monitored by environmental surveillance authorities.

**Treatment in an On-site Incinerator**
- Waste treatment in an on-site, high temperature, dual chamber, semi-pyrolytic incinerator—which operate at temperatures of over 800°C in the primary chamber, and 1000°C in the secondary chamber), with a good emissions management system is recommended for larger secondary healthcare facilities that is in a region where there is no secondary or tertiary healthcare facility with a good quality incinerator installed. This incinerator should be used to manage HCW from other healthcare facilities in the region, especially by utilizing specialized private HCW managers for waste collection, and whose standards of operation would be supervised by the relevant environmental regulatory authorities.

*Note: An Environmental & Social Impact Assessment (ESIA) would be carried out prior to the installation of incinerators in line with the existing laws in Nigeria and World Bank safeguards Policies.*

**Treatment in a De-Montfort WDU**
- As with the primary healthcare facilities, burning in low temperature incinerators, such as a well-designed, constructed and managed-Montfort Waste Disposal Unit (DWDU) would be satisfactory. However, as noted above, this option is not satisfactory environmentally, and should only be considered a short-term solution to HCW treatment in a secondary healthcare facility.

**Treatment in a Burial Pit**
- Burying of the HCW in specially constructed pits (lined with impermeable materials such as clay) as described above for treatment of HCW in primary healthcare facilities would be acceptable for use in secondary healthcare facilities where incinerators are unavailable.

**f) Final Disposal of HCW**
To fulfil Best Environmental Practices (BEP), an Environmental and Social Impact Assessment (ESIA) will precede commencement of any civil works aimed at installation of incinerators in both primary and secondary healthcare facilities.

**g) Disposal Procedural Steps**
- Provide secured appropriately lined pits for final disposal of incineration ash.
- Transportation of incineration ash and non-hazardous and treated hazardous waste (that has been rendered non-infectious) to engineered designated (sanitary) land fill sites.
ANNEX 3: Required Personal Protective Equipment (PPE) For Safe HCWM

Waste Handlers and Incinerator operators should always have adequate personal protective equipment (PPE). PPE must be worn at all times when working with health care waste. It is important that the PPE is properly maintained and kept clean; it should not be taken home; and must remain at the health facility to avoid possible spread of infection to the community.

Standard PPE generally includes:

- **Gloves**: Always wear gloves when handling health care waste. Puncture-resistant gloves should be used when handling sharps containers or bags with unknown contents. Heat-resistant gloves should be worn when operating an incinerator.
- **Boots**: Safety boots or leather shoes provide extra protection to the feet from injury by sharps or heavy items that may accidentally fall. Boots must be kept clean.
- **Overalls**: Overalls should be worn at all times.
- **Goggles**: Clear, heat-resistant goggles can protect the eyes from accidental splashes or other injury.
- **Mouth respirators**
- **Helmet (for incinerator operators)**: Helmets protect the head from injury and should be worn at all times during the incineration process.

Health Worker Safety Measures

**Hand hygiene**

Running Water and soap should be available to ensure clean hands after handling HCW. Hand washing is one of the oldest, most well-known methods of preventing disease transmission. HCW handlers and incinerator operators should always wash their hands after handling HCW.

**Medical examinations**

Healthcare waste handlers and incinerator operators should be medically examined prior to initial employment and undergo regular medical examinations every 6 months. They should also be immunized for Tetanus and Hepatitis B Virus.
ANNEX 4: Guidelines for the Disposal of Health Care Waste
By Pit Burial

Introduction

The recommended method for HCW disposal in the primary and secondary healthcare facilities at present is the use of burial pits. This option has been chosen because of the need to act quickly in managing the critical negative impacts which the very poor management of HCW in Nigeria is having on the environment and the human population. To wait till other technology options that are more environmentally sound are available would delay the implementation of the project, and needlessly expose the HCW workers to deleterious health impacts.

NOTE:

If HCW are not buried properly, wild animals, dogs, or birds could exhume them and help spread diseases. Partially decayed HCW are unsightly, attract rodents, smell and are a breeding spot for flies.

All healthcare facilities generate some quantity of hazardous wastes which need to be treated in an environmentally sound manner. It is important to note that adequate expertise is required for proper disposal of such wastes with consideration to mitigate to the lowest levels the negative environmental and possible human impacts. Necessary standard operating procedures for pit burial of HCW are described below, with the aim of giving HCWM personnel a hands-on approach to safe disposal of hazardous healthcare wastes.

Factors to consider

A) Ground Water Contamination Concerns

Burial of hazardous HCW in areas susceptible to ground water contamination could result in adverse effects in nearby wells, boreholes and streams. The potential for ground water contamination and subsequent water contamination of other sources is a function of the soil type, bedrock depth, and ground water depth

Soil Type
Coarse soils may increase ground water contamination risks because they allow rapid movement of liquids away from the burial site with minimal filtration or treatment.

Bedrock Depth
Open fractures in bedrock permit rapid movement of contaminated water with minimal filtration or treatment. Shallow bedrock is therefore a concern.

Ground Water Depth
The zone above the ground water table up to the soil surface is effective in destroying some biological contaminants. However, this zone is minimal in areas where the water table is high. Depending on the combination of these three features, the ground water contamination potential could change.

A specified method of determining the potential for ground water contamination at the burial site area will be adopted. It indicates how to determine if the ground water contamination potential is High, Low, Moderate or Very Low.

Note: Avoid areas of thin soil cover over a bedrock layer.

B) Surface Water Contamination Concerns

Improper burial of hazardous HCW can also result in surface water contamination, affecting the water quality draining into watercourses, open-top catch basins and ponds. Some land, have a higher potential for surface water contamination because of the topography and soil type.

Topography
Hilly land is of more concern than flat land, since it promotes more rapid surface water runoff during spring runoff or heavy rainfall.

Soil Type
Since they promote more rapid runoff, heavier soils such as clay are of more concern than lighter soils such as sand. Unfortunately, the best soil condition to reduce ground contamination (a fine-grained, heavy soil like clay) also helps promote rapid runoff that can contribute to surface water contamination. In most cases, the optimum burial site is one that is relatively level.
Site Selection

Important considerations for burial site selection include the following.

Access: Access is needed for the equipment to dig the burial pit. There should be sufficient space for the temporary storage of overburden.

Environment: Selection should take into account:
- Distance to watercourses, boreholes and wells.
- The height of the water table.
- Proximity to buildings, especially houses and surrounding farms.
- Proximity to neighbors or public lands, including roads.
- The slope of the land and drainage to and from the pit.
- The permeability of the soil.
- The direction of the prevailing wind (to manage odor).

Consideration may need to be given to the lining of pits and the treatment of leachate and gas, depending on soil type, location, and volume of material to be buried.

Construction. Soils should be stable enough to withstand the weight of equipment used to construct and fill the pit. If necessary, surface run-off should be prevented from entering the pit by the construction of diversion banks. Similar banks should be constructed to prevent any liquids escaping from the burial site.

Fencing: It is very necessary to fence-in the burial pit to exclude animals and people.

Land suitability for Burial of HCW

To check the suitability of land for the burial of HCW, consult soil and topographic maps, and dig test holes in the area to see how close the ground water is to the soil surface. Soil auger probes are available in extendable lengths that allow simple depth investigations up to 3 m (10ft.).

Do not bury HCW on hilly land, because the soil covering the HCW could wash out during rainstorms, and surface water could become contaminated. Keep burial sites on relatively flat land.

Sizing the Burial pit

Burial Depth and Cover

Dig the burial hole to a depth of about 1.2-2.0 m deep (4 - 6.5 ft.) below the original ground level. Width of the pit should be determined by the quantity of wastes generated by the facility.

Note: Deeper holes are more difficult to dig, particularly if the inside slopes are quite steep; shallower holes would not permit at least 0.6 m (2 ft.) of soil cover; and wider and longer holes could take an unacceptably long time to fill before moving on to another site.

Place HCW in pit and cover completely with soil cover. When the pit is filled to a depth of about 1ft to the surface it should be covered with a minimum of 0.6 m (2 ft.) of soil, [including soil crowned up over the hole about 0.3 m (1 ft.)]. This mounding helps prevent scavenging animals from exhuming the HCW, allows for settling and helps shed surface water.

Note: Several small burial sites that are spread out are better than fewer, larger sites.

Distances from Burial Sites to Water Sources

Maintain the separation distances from burial sites to open-top catch-basins, or natural watercourses to at least 50 m (165 ft.), provided the burial sites are on relatively flat land under.

Keep burial sites at least 15 m (50 ft.) from ground drainage systems and gutters.

As a guideline, don't bury HCW any closer than about 15 m (50 ft.) from all property lines, and 100 m (330 ft.) from neighboring homes. Keep HCW and burial sites out of view, if possible.

Digging a Proper HCW Burial pit
Note: To overcome the Health and Safety issues associated with vertically or straight-sided pits (such as collapsing walls), and environmental concerns about uncontained leachate, it is good practice to use pits with outwardly sloping sides (as shown above) to prevent collapse and allow for impervious liners to contain leachate. There must also be enough cover to prevent waste from surfacing.

Pit Management Guidelines
To prevent problems, cover the HCW with 0.12 m (4 in.) of soil between burial intervals, then cap the hole with a 13 mm (1/2 in.) thick 1.2 x 2.4 m (4 ft. x 8 ft.) piece of plywood, or equivalent, that is secured on the top edges with soil.

Install a bright flag warning of the pit location.
Problems with pit burial include rainwater accumulating in the pit between burials, and safety concerns with slumping inside slopes since they are usually steep.

Record Keeping
Keep records of the burial sites to avoid digging the same location again too soon. Important information to record for each site is:
- exact location in relation to some fixed point
- date of pit usage and closure
- Essential Considerations
- Personnel Safety
- Safety of personnel is an overriding consideration. Aspects to consider include;

Hygiene
The hygiene of the personnel working on the site (especially the availability of hand-wash materials).
Suitable Personal Protective Equipment (PPE) especially for coverall, boots, gloves and dust protection.

Before the use construction and operation of the Burial Pits, personnel should be properly trained and briefed.

Leachate Production
Leachate is the liquid that is released during the decomposition of wastes. This can be managed by the use of an impervious layer to cover the base and sides of the pit during construction. Impervious materials could be clay soil or plastic material lining.

Site inspection and monitoring
Regular inspection of the burial pit site after closure is recommended so that appropriate action can be taken in the event of seepage or other problems. The objective is to return the site to its original condition.

Advice for an ongoing environmental monitoring program of burial sites and the water table will need to be obtained from the Environmental Management Plan (EMP) consultant.
ANNEX 5: Options for Treatment of Sharps for the MPA

Disinfection of syringes with bleach
Household bleach can be used to disinfect sharps and other wastes at an appropriate concentration (0.5% chlorine solution). Disinfection is aimed at reducing the pathogenicity of infectious health-care wastes. Disinfecting procedures must be followed carefully to be effective. Disinfection only serves to reduce the risk from accidental exposure to sharps prior to treatment or disposal and can serve as a pre-treatment prior to employing subsequent treatment technologies, e.g. sending to a centralized incinerator or burial in pits.

Needle remover
The used needle is inserted into a device, which cuts or pulls the needle off from the syringe. Various designs available are shown in the figure below. The devices are inexpensive and can be made locally. Removal of needles from used syringes with needle removers can render them unfit for reuse and safe for disposal after disinfection. Subsequently the plastic syringes can be disinfected and sent to a centralized incinerator for further actions.

Encapsulation
Encapsulation involves filling containers with waste, adding an immobilizing material (plastic foam, bituminous sand, cement mortar, or clay) and sealing the containers. After the medium has dried, the containers are sealed and disposed of in a landfill. The main advantage of the process is that it is very effective in reducing the risk of scavengers gaining access to the hazardous health-care waste. Encapsulation of sharps however, be envisaged in temporary settings, such as camps, or mass campaign, and provided that raw materials are available. Encapsulation of used sharps is generally not practiced and not a long-term solution. The sharps can then be incinerated at the centralized pit.

Procedure for “Sharps” Disposal
The recommended methods of managing HCW in primary and secondary health facilities have been presented in the main body of
The following technology options are recommended for the disposal of “Sharps”:

1. **Use of Centralized Incineration**
   Incineration presents a good option for good disposal and destruction of sharps-wastes. However, concerns such as availability of technical knowhow, maintenance, environmental pollution, etc should be considered. Incineration has the potential for toxic emissions, particularly if the waste stream is not regulated, as is usually the case if the equipment is not properly operated and maintained, and if the emissions management system is inadequate. Large-scale incinerators tend to pollute less than small-scale incinerators because the combustion temperature is higher and combustion efficiency (gas residence time) is better.

   Rather than having an incinerator in several facilities, a centralized, large-scale health care waste incineration plant should be located in a tertiary or secondary healthcare facility in a region. Sharps wastes from healthcare facilities in the region are then transported to the incinerator site for incineration. The sharps should be transported in sharps boxes.

2. **Pit Burial for Sharps**
   Pits for sharps can be constructed in the facilities. The bottom and sides of the pits should be covered with a low permeability material (such as clay), and fenced. The pit should be 3–5 meters in depth and approximately 2 meters wide. It should be sealed with cement once it is three-quarters full or at least the last 50cm should be filled with compacted soil and the area identified with a red coloured flag. This approach is simple and adequate for health facilities that generate small amount of waste.

3. **Cemented sharp pit**
   Pit-well covered with a narrow access for sharps should be filled with cement once full.
## ANNEX 6: Sample Waste Deposit Record

<table>
<thead>
<tr>
<th>Day of the month</th>
<th>Waste deposited</th>
<th>Origin of waste (Ward/Dept., etc)</th>
<th>Means of transport to Disposal Site</th>
<th>Type of Disposal Facility and Address</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Sharps (kg)</td>
<td>Infectious (kg)</td>
<td>Highly Infectious</td>
<td>Other (kg)</td>
</tr>
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</tbody>
</table>
ANNEX 7: Questionnaire For Healthcare Waste Management Practices

Name of Respondent:____________________________________________________________
Designation of Respondent:________________________________________Date:
Name of Facility:________________________________________________________________
State:________________________________________________________________________

PART 1: AWARENESS & CAPACITY LEVEL

1. Are you aware of the National Health Care Waste Management Plan and Guidelines of the Government of Nigeria and do you have copies?
Response:________________________________________________________________________

2. Has any training on the Nigeria Strategic Health Care Waste Management Plan and Guidelines issued by Government of Nigeria in 2013 been conducted in your state/facility since 2017?
Response:________________________________________________________________________

3. Have any service providers of healthcare centers in your state/facility been trained in Health Care Waste Management? Who provided the training - World Bank supported projects (e.g. NSHIP; SOML; Malaria project; HIV/AIDS project or Polio Project)? Or other development partners? Specify
Response:________________________________________________________________________

4. Are there any structured HWCM training programs for service providers of primary health care centers in your state/facility?
Response:________________________________________________________________________

5. Are there any training manuals or materials available on health care waste management at SMoH/SMEP/SPHCDA in your state/facility?
Response:________________________________________________________________________

6. Do the Primary Health Care facilities in your state/facility have posters/hand-flyers guiding on correct practices for segregation, disinfection, disposal and management of healthcare waste?
Response:________________________________________________________________________

PART 2: SEGREGATION PRACTICES

7. What are the different types of waste generated in Primary Health Care facilities in your state/facility?
8. What is the approximate volume (in kilograms or other appropriate measure) of
   a. Municipal (e.g. food, paper, bottles/cans etc.) waste generated per day in one PHC in your state?
      Response:
   b. Sharps (e.g. needles/syringes, blades, broken glass etc. in number of safety boxes) generated per day in your hospital or one primary healthcare centre in your state/facility?
      Response:

9. Do you use color coded bins for waste disposal in your hospital/facility?
   Response: ____________________________
   If yes, what is the color of bins for:
   a. Collecting non-hazardous wastes (such as paper, cardboard, ash)
      Response: ____________________________
   b. Collecting infectious wastes (such as swabs, materials potentially infected blood)
      Response: ____________________________
   c. Collecting sharps (such as needles, syringes, blades, scalpels)
      Response: ____________________________
   d. Collecting hazardous waste (such as vials, drugs, vaccines, pharmaceuticals)
      Response: ____________________________
   e. Collecting highly infectious waste (such as anatomical parts, placentas, foetus)
      Response: ____________________________

PART 3: WASTE COLLECTION

1. Is there a dedicated area used for collection of the following waste for disposal in your state/facility, if yes, where?
   b. Infectious waste? Response: ____________________________
   c. Sharps? Response: ____________________________
   d. Other infectious waste? Response: ____________________________
   e. Hazardous waste? Response: ____________________________

2. Who is responsible for collecting waste from all sections of facilities in your state/facility?
   Response: ____________________________

3. How frequently is all the waste from all departments in the health facility collected?
   Response: ____________________________

PART 4: WASTE TREATMENT & DISPOSAL

4. How is non-hazardous wastes (such as paper, cardboard, ash) treated in your state/hospital?
   Response: ____________________________

5. How is infectious wastes (such as swabs, materials potentially infected blood) treated in your state/hospital?
   Response: ____________________________

6. How sharps (such as needles, syringes, blades, scalpels) treated/ disposed off?
   Response: ____________________________

7. How is highly infectious waste (such as anatomical parts, placentas, foetus) usually treated in your state/hospital?
   Response: ____________________________

8. How are hazardous waste (such as vials, drugs, vaccines, pharmaceutical products) treated in your state/hospital?
   Response: ____________________________
9. How are the following wastes disposed in PHCs in your state?
   a. Non Hazardous waste (such as paper, cardboard, ash)?
      Response: ____________________________
   b. Infectious wastes (such as swabs, materials potentially infected blood)?
      Response: ____________________________
   c. Sharps (such as needles, syringes, blades, scalpels)?
      Response: ____________________________
   d. Highly infectious waste (such as anatomical parts, placentas, foetus)?
      Response: ____________________________
   e. Hazardous wastes (such as vials, drugs, vaccines, pharmaceuticals products)?
      Response: ____________________________

10. What is the usual frequency of waste disposal from your hospital/facilities in your state?
    Response: ____________________________

**PART 5: ON-SITE STORAGE & TRANSPORTATION**

11. What is the maximum time HCWs are stored before being treated / disposed of on-site or transported off-site.
    Response: ____________________________

12. Do you have storage facilities for HCW in your state/hospital?
    Response: ____________________________

13. Are there dedicated trolleys, carts, vehicles for the transportation of health care waste from within and away from your hospital/facilities in your state? Specify.
    Response: ____________________________

14. How is waste usually transported from the PHC facilities to dumpsites in your state?
    Response: ____________________________

**PART 6: RECORD KEEPING, MONITORING AND EVALUATION**

15. Is there an internal Health Care Waste Manifest/Book/Record (i.e. details on type, volume and weight, generated; type and volume transported, commissioned waste contractor; volume treated and disposed etc.) for PHC facilities in your state?
    Response: ____________________________

16. Who is responsible for the Health Care Waste Manifest in your hospital/PHC facilities in your state?
    Response: ____________________________

17. Does your hospital/PHC facilities in your state; have waste management committees or a staff designated to handle HCW?
    Response: ____________________________

18. Does your hospital/PHC facilities in your state; have/ implement a monitoring plan to check for effectiveness and compliance with regulatory requirements?
    Response: ____________________________

**PART 7: INFRASTRUCTURE & FINANCING**

19. What proportion of PHCs in your state on an average lack
    a. IEC materials for practicing HCWM? Response: ____________________________
    b. Template for HCW data entry Response: ____________________________
    c. Color coded waste collection bins? Response: ____________________________
    d. Personal protective gear (Aprons, boots, masks) for waste handlers? Response: ____________________________
    e. Consumables such as color-coded bags, gloves, hypochloride/bleach? Response: ____________________________
20. Is any dedicated annual budget available to health centre for implementation of HWCM as in line with the National Strategic Health Care Waste Management Plan and Guidelines issued by Government of Nigeria?  
Response: ________________________________

PART 8: OTHER ENVIRONMENTAL & SOCIAL CONCERNS

21. Are there other environmental and or social concern(s) that may arise as a result of this project?  
Response:  

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Thank you for your cooperation
# ANNEX 8a: Stakeholders Attendance Sheet

## STAKEHOLDERS CONSULTATION ATTENDANCE SHEET

<table>
<thead>
<tr>
<th>S/N</th>
<th>NAME</th>
<th>MALE/FEMALE</th>
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<td>Dr. Abubakar Oshoia</td>
<td>M</td>
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<td>Pharma Dr. Nosa Iyah</td>
<td>M</td>
<td>PM, SANEP, SMHE, EDO</td>
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<td>6</td>
<td>Mr. Emele Sunday</td>
<td>M</td>
<td>PM, SANEP, SMHE, EDO</td>
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<td>7</td>
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ANNEX 8b: Stakeholders Attendance Sheet for Benue State Visit
## ANNEX 8c: Stakeholders Attendance Sheet for Kogi State Visit

### ATTENDANCE AT MEETING OF

**DATE:** 15-3-2019

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