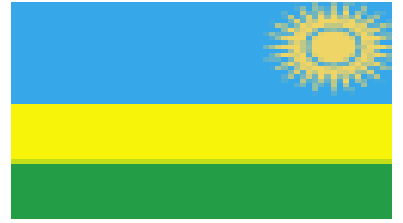




**THE REPUBLIC OF RWANDA**



**RWANDA ENVIRONMENT MANAGEMENT AUTHORITY (REMA)**

**Environmental Impact Assessment Guidelines  
for  
Waste Management in Rwanda**

**Dec 2009**

## **FOREWORD**

The principal environment management law, the Organic Law No. 04/2005 provides the modalities for protection, conservation and promotion of environment in Rwanda. The requirement for all projects to be subjected to Environmental Impact assessment (EIA) is stated by the Organic Law in article 67. General principles and specific responsibilities for the management of the environment are clearly spelt. The Rwanda Environment Management Authority therefore within its mandate has embarked on the preparation of environmental management regulations and guidelines. These guidelines for EIA for waste management are one such sectoral guideline prepared to provide for the EIA process specific to waste management.

These guidelines serve as an administrative directive to guide EIA for waste management. The guidelines should be used together with the General EIA Guidelines 2006 and any other relevant EIA instruments developed by REMA.

**Dr. Rose Mukankomeje**

**Director General, REMA**

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## LIST OF ACRONYMS

ADB	African Development Bank
CFCs	Chlorofluorocarbons
CP	Cleaner production
EA	Environmental Audit
EDPRS	Economic Development and Poverty Reduction Strategy
	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
GHGs	Greenhouse gases
GoR	Government of Rwanda
IEE	Initial Environmental Examination
ISAR	Institut des Sciences Agronomiques du Rwanda
IRST	Institute
EIA	for Scientific and Technological Research
KCC	Kigali City Council
KIST	Kigali Institute for Science and Technology
LG	Local Governments
MDGs	Millennium Development Goals
MINIRENA	Ministry of Natural Resources
MINAGRI	Ministry of Agriculture and Animal Resources
MINALOC	Ministry of Local Government
MINICOM	Ministry of Commerce and Industry
MININFRA	Ministry of Infrastructure
MINITERE	Ministry of Lands, Environment, Forestry, Water and Mines (Now ministry of Natural Resources, MINIRENA)
MINECOFIN	Ministry of Finance and Economic Planning
MINIJUST	Ministry of Justice
MIGEPROFE	Ministry in Prime Minister's Office in charge of Gender and Family Promotion
MINISANTE	Ministry of Health
MINEDUC	Ministry of Education

NEMA	National Environment Management Authority
NGOs	Non Governmental Organization
NUR	National University of Rwanda
ORTPN	Office Rwandais du Tourisme et des Parcs Nationaux
ODS	Ozone Depleting Substances
RBS	Rwanda Bureau of Standards
RDB	Rwanda Development Board
REMA	Rwanda Environment Management Authority
SWAP	Sector Wide Approach
ToR	Terms of Reference
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
UNFPA	United Nations Population Fund
USAID	United States Agency for International Development
VECs	Valued Environmental Components
VOCs	Volatile Organic Carbons
WB	The World Bank

## Definitions

**Authority:** means the Rwanda Environment Management Authority (REMA).

**Environment:** are the physical factors of the surroundings of the human beings including land, water, atmosphere, climate, sound, odour, taste, the biological factors of animals and plants and the social factor of aesthetics and includes both the natural and built environment.

**An Impact:** is the effect of any action that affects one or more elements of the natural, social or economic environment, either adversely or beneficially.

**Cumulative Impacts:** those impacts that result from the incremental impact of the proposed action added to the impacts of other past, present, and foreseeable future actions.

**Proponent/Developer:** means a person, group of persons or agency developing a new project or proposing to extend an existing project which is subject to an environmental impact assessment process.

**Direct Impacts:** those impacts that are caused by the action and which generally occur at the same time and place as the action.

**Indirect Impacts:** those impacts that induce changes in the natural environment, population, economic growth, and land use, as a result of actions not directly linked to the project in question.

**Environment Impact Assessment (EIA):** a systematic examination conducted to determine whether or not a project will have any adverse impacts on the environment.

**Environmental Impact Statement (EIS):** the written report which presents the results of an Environment Impact Study.

**Environmental Impact Study:** means the study conducted to determine the possible environmental impacts of a proposed policy, project or activity, and measures to mitigate any such impacts.

**Environmental Monitoring:** the continuous determination of the actual and potential effects of any activity or phenomenon whether short-term or long term.

**Guidelines:** means the description of the methodology for implementation of environmental impact assessment adopted by the Authority.

**Lead Agency:** any Ministry, Department, Parastatal agency, Local Government system or Public Officer in which or in whom any laws vests functions of control or management of any segment of the environment.

**Mitigation measures:** actions which reduce, avoid or offset the potential adverse environmental consequences of a project, and include engineering works, technological improvements,

management measures and ways and means of ameliorating effects to the environment and losses suffered by individuals and/or communities, including compensation and resettlement.

**Participation:** a process through which stakeholders' influence and share control over development initiatives and decisions or resources that affect them.

**Pollution:** any direct and indirect alteration of the physical, thermal, chemical, biological or radioactive properties of any part of the environment by discharging, emitting or depositing wastes so as to affect any beneficial use adversely, to cause a condition which is hazardous or potentially hazardous to public health, safety or welfare, or to animals, plants or aquatic life, or to cause a contravention of any condition, limitation or restriction to a healthy environment.

**Project:** a set of planned activities to achieve objectives within a given area and time frame.

**Project brief:** a summary statement designed to achieve specific objectives within a given area and the likely environmental impacts and mitigation measures thereto.

**Scoping:** is the early transparent process of interaction that identifies concerns, evaluates them, organises by eliminating insignificant impacts and focusing on significant impact for further assessment so that attention and therefore resources, can be effectively and efficiently utilised.

**Screening:** selection of actions or projects requiring EIA. Common methods for screening include: project threshold, sensitive area criteria, positive and negative list, preliminary assessment/ IEE.

**Significance:** an expert evaluation/judgment of the magnitude of impact or the degree to which a proposed activity or project may (potentially) impact on the environment if implemented.

**Significant effect:** substantial, or potentially substantial, adverse changes in any of the physical factors of the surroundings of human beings including land, water, atmosphere, climate, sound, odour, taste, the biological factors of animals and plants and the social factor of aesthetics and includes both the natural and built environment.

**Stakeholders:** those affected by the outcome of a project or can affect the outcome of a proposed either negatively or positively.

**Waste:** *is a by-product of day to day activities or anything, which is no longer useful to someone and disposed of. It is an unwanted or undesired material or substance that is thrown away.*

## **PART I: INTRODUCTION**

### **1. INTRODUCTION**

The Republic of Rwanda has environmental challenges that have been faced by the population for decades. These environmental challenges are evident in terms of land and wetlands degradation, water pollution, soil erosion etc. Poverty, low level of awareness, inadequate resources (technical, human, financial), low inter-sectoral coordination and socio-economic activities exacerbate the environmental degradation impacts. Apart from the high population pressure on natural resources that cause environmental degradation another area of great concerns are large projects like industries, solid waste dumps or landfill (e.g. in Kigali City) and agriculture.

Waste management is a big challenge in Rwanda especially within the urban areas. For example in Kigali City only about 24% of the solid waste generated is disposed legally at Nyanza landfill. Wastewater and sewage also cause management problems if the management infrastructure is not adequate. Industrial effluent and diffuse release from agricultural activities are other forms of pollution to the environment.

In the growing complexity of problems, precautionary measures such as environmental impact assessment (EIA) of projects to ensure adequate waste management can work out to be more effective. To effectively manage environmental challenges, GoR established Rwanda Environmental Management Authority (REMA), under Organic Law No.04/2005 of 08/04/2005 article 64, to coordinate and oversee all aspects of environmental management for sustainable development. One of REMA's principal functions is to oversee the conduct of EIA in Rwanda.

#### **1.1 Background to the Environmental Impact Assessment guidelines**

Waste pollution is considered a serious threat and can broadly be defined as any pollution associated with waste and waste management practices. Pollution or contamination by waste can cause direct harm to humans, domestic animals, wildlife and the environment. It is therefore very important to have in place an efficient waste management system to prevent the harmful impacts of wastes. The Republic of Rwanda has initiated efforts to improve the quality of the environment and enhance economic well-being. In recognition of the need to protect the environment from adverse impact of developmental activities the government of Rwanda requires the conduct of EIA of projects that are likely to have significant effect on the environment before implementation. To streamline the conduct of EIA the *General Guidelines and Procedure for Environment Impact Assessment* for Rwanda was published in 2006. The environment being complex and coupled with development in the different sectors, it was found desirable to develop sectoral EIA guidelines. The sectoral EIA guidelines are intended to guide the process of EIA in the different sectors. One such is the EIA guidelines for waste management. The EIA guidelines for waste management are developed to guide the process of EIA for waste management in Rwanda. The EIA Guidelines will serve agencies and individuals involved in the EIA, waste managers and



those involved in projects that generate waste with potential impacts on the environment. It is part of the legislative tool being put in place for sustainable waste management in Rwanda

## **1.2 Definition of Environmental Impact Assessment**

Environmental impact assessment (EIA) is *“an assessment of the impact of a planned activity on the environment”*. EIA is the process used to integrate environmental management with planning for development proposals. In essence, EIA is a systematic process whereby information about the environmental effects of an action is collected and evaluated, with the conclusions being used as a tool in decision-making. The General Guidelines and Procedure for Environmental Impact assessment (REMA 2006) defines EIA as *“a systematic, reproducible and multilevel process of identification, prediction and analysis of significant environmental impacts (positive or negative) of a proposed project or activity and its practical alternatives on the physical, biological and socio-economic characteristics of a particular geographical area in order to provide information necessary for enhancing decision making”*.

## **1.3 The Purpose of the Guidelines**

A key objective of the EIA guidelines is to provide clear and detailed advice on carrying out effective EIA for waste management. This includes amongst others the purpose of EIA and the guidelines, the role of EIA in decision-making, the policy, legal and institutional framework, the environmental EIA procedure and the assessment process. The overall goal is to employ an integrated approach to the management of waste that arise from various activities (e.g. urban, domestic, industrial, agricultural, etc) and achieve ecologically sustainable development.

### **1.3.1 The Objectives of the Guidelines**

The EIA guidelines for waste management set the minimum standards or controls for project activities that may cause significant waste impacts on the environment. The specific objectives of the waste management EIA guidelines are:

- i) to provide direction and information for decision making by the REMA regarding waste management EIA;
- ii) to provide advice on waste management EIA processes;
- iii) to enable proponents/developers and stakeholders to participate effectively in waste management EIA process and related administrative actions; and
- iv) to enable environmentally adequate management of waste in all institutions as well as development projects.

### **1.3.2 The Scope**

The waste management EIA guidelines shall apply to all projects with associated waste generation or waste management components which are listed under Article 2 of the Ministerial Order establishing the list of works, activities and projects that have to undertake

Environmental Impact Assessment and those listed in these guidelines (appendix V). The Guidelines are intended to be used by:

- i) Rwanda Environment management authority (REMA)□;
- ii) EIA consultants undertaking waste management EIA studies in Rwanda;
- iii) Proponents of waste management projects or projects with major waste generating components;
- iv) Stakeholders affected by waste management proposals or projects generating wastes; and
- v) Community representatives, interested persons and organisations.

These guidelines provide advice to encourage sound EIA outcomes across all phases of planning for waste management proposals from project conception and design to approval. When using these guidelines it should be recognised that each waste management proposal has specific features (e.g. location, type of waste, etc) and proposal specific issues that should be taken into account. The approach used to conduct the EIA should take account of the particular unique circumstances of the individual projects.

### **1.3.3 Quality assurance**

Roles and responsibilities of key stakeholders in the waste management process are dynamic and may change with time. It therefore may be necessary to review these guidelines periodically. This is to ensure a continuous improvement approach to the provision of advice and information by REMA. Reviews may be triggered by changes to policy or legislation; changes or requests for reviews by stakeholders.

## **PART II: POLICIES, LEGAL AND INSTITUTIONAL FRAMEWORK**

### **2. POLICIES, LEGAL AND INSTITUTIONAL FRAMEWORK FOR WASTE MANAGEMENT EIA**

#### **2.1 International Context of Environmental Assessment**

Environmental Impact Assessment is an environmental management tool that identifies environmental impacts, mitigation measures and development alternatives to enable sustainable socio-economic development. EIA is one of the tools for the achievement of commitments to international environmental conventions. The Government of Rwanda has ratified several international conventions and agreements on the protection of the environment and sustainable development. Some of the Conventions ratified by Rwanda that are relevant to waste management include:

- i) BASEL Convention on the Control of Transboundary Movements of Hazardous wastes and their disposal as adopted at BASEL on 22 March 1989, Presidential Order n° 29/01 of 24 August 2003.
- ii) The Stockholm Convention on Persistent Organic Pollutants (POP), ratified in June 2002.
- iii) The Convention on Substances that Deplete the Ozone Layer, Presidential Order n° 30/01 of 24 August 2003 .
- iv) The Kyoto Protocol to the Framework Convention on Climate Change ratified by Law n° 36/ 2003 of 29 December 2003.
- v) The United Nations Framework Convention on Climate Change signed in RIO DE JANEIRO in BRAZIL on 5 June 1992, Presidential Order n° 021/01 of 30 May 1995.
- vi) The Convention on Prior Informed Consent (PIC), which applies to dangerous chemicals and pesticides sold across national borders, signed on 11 September 1998
- vii) The Rotterdam Convention on the establishment of international procedures agreed by states on commercial transactions of agricultural pesticides and other poisonous products, by Presidential Order n° 28/01 of 24 August 2003.

#### **2.2 Rwandan Policies and Regulations Relating to EIA**

The Environment Policy (2003) sets the overall goals for environmental management in Rwanda. The policy emphasises improved management of the environment at both central and local levels consistent with the policy on decentralisation and good governance. All government policies take into account environmental protection as a priority (Environment Indicators, REMA 2007). Environment is treated as a sector and a cross cutting issue in the Economic Development and Poverty Reduction Strategy (EDPRS) document (2007). The environment policy provides for the institutional and legal reforms. The implementation of environmental management strategies employs the Sector Wide Approach (SWAP), which

brings with it the advantage of synergies among different development actors. A key tool of environmental management being applied in Rwanda is Environmental Impact Assessment and the government Rwanda through REMA produced a General EIA Guidelines and now has embarked on the developing of Sectoral Guidelines, one of which is for Waste Management activities.

There are specific provisions within the Organic law (No 04/2005 of 08/04/2005) that deal with EIA, the requirements for EIA and the contents of EIA. It also states clearly general and specific responsibilities in the management of the environment and environmental conservation. Relevant articles in the Organic law to Environmental Impact Assessment and Waste Management are:

- i) *Article 3: Every person has the duty to protect, conserve and promote environment. The State has a responsibility of protecting, conserving and promoting the environment.*
- ii) *Article 6: Every person in Rwanda has a fundamental right to live in a healthy and balanced environment. He or she also has the obligation to contribute individually or collectively to the conservation of natural heritage, historical and socio-cultural activities.*
- iii) *Article 7 (3<sup>0</sup>). Adopts the **Polluter pays principle**. Every person who demonstrates behaviour or activities that cause or may cause adverse effects on environment is punished or is ordered to make restitution. He or she is also ordered to rehabilitate it where possible.*
- iv) *Article 8 : 10 to 60 lists projects and activities that ( may generate different categories of wastes or cause risks) are subject to regulation by the national laws of Rwanda*
- v) *Article 18: Water from the sewage system as well as any liquid waste must be collected in a treatment plant for purification before being released into a river, a stream, a lake or a pond.*
- vi) *Article 26: Any activities that may pollute the atmospheric pressure are governed by an order of the Minister having environment in his or her attributions. Burning of garbage, waste or any other object (tyres, plastics, polythene bags and others) shall respect regulations of competent authorities.*
- vii) *Article 27: The use of substances that pollute the atmospheric pressure that deplete the Ozone Layer or that may cause climatic changes is governed by an order of the Minister having environment in his or her attributions.*
- viii) *Article 32: No one is permitted to dispose waste in an inappropriate place, except where it is destroyed from or in a treatment plant and after being approved by competent authorities.*
- ix) *Article 33: Any waste, especially from hospitals, dispensaries and clinics, industries and any other dangerous waste, shall be collected, treated and changed in a manner that does not degrade the environment in order to prevent, eliminate or reduce their adverse effects on human health, natural resources, flora and fauna and on the nature of the environment.*

- x) Article 34: *Burying toxic waste is only done when there is an authorisation and in accordance with special regulations determined by an order of the Minister having environment in his or her attributions.*
- xi) Article 35: *Removal of waste shall be done in accordance with existing rules and where possible it shall be carried out with an aim of enhancing productivity.*
- xii) Article 40: *Public administration, private institutions, international organisations, associations and individuals are obliged to conserve the environment at all possible levels.*
- xiii) Article 47: *The treatment of liquid waste is the obligation of the State, the population and all other parties that may perform activities that degrade the environment. Concession regarding treatment of such liquid waste may be granted to any other competent person.*
- xiv) Article 48: *Central Government administration and decentralised entities are obliged to prepare a plan of action and to draft emergency plans in all domains in order to protect the environment.*
- xv) Article 56: *The State establishes appropriate standards for treatment of waste in order to produce more productivity (10 to 30, provides the means of achieving this)*
- xvi) Article 59: *Competent authorities shall coordinate national activities and monitor the implementation of international conventions and agreements relating to environment.*
- xvii) Article 62:
  - *Decentralised entities shall have the responsibility of designing plans of collecting and treatment of domestic waste.*
  - *Decentralised entities are also responsible for collecting and piling domestic waste. This is carried out in collaboration with institutions, Districts, Towns and Municipalities or associations and authorised competent individuals.*
  - *Decentralised entities shall also put much emphasis on the removal of any other waste in any possible way depending on its nature and quantity, supervision and its treatment.*
  - *Upon the advice of the committees responsible for the protection of environment referred to in article 66 of this organic law, consultative committees of Districts, Towns and Municipalities, shall determine a hygiene and sanitation service fee.*
- xviii) Article 67: *Every project shall be subjected to environmental impact assessment, before obtaining authorisation for its implementation. This applies to programmes and policies that may affect the environment. An order of the Minister having environment in his or her attributions shall determine the list of projects mentioned in this organic law.*
- xix) Article 69: *The environmental impact assessment shall be examined and approved by the Rwanda Environmental Management Authority or any other person given a written authorisation by the Authority. The promoter pays a levy reduced from the operating cost of his or her project excluding the working capital. This tax is determined by the law establishing the National Fund for the Environment. The environment impact assessment shall be carried out at the expense of the promoter.*
- xx) Article 70: *An order of the Minister having environment in his or her attributions establishes and revises the list of planned works, activities and projects, and of which*

*the public administration shall not warrant the certificate, approve or authorise without an environmental impact assessment of the project. The environmental impact assessment shall describe direct and indirect consequences on the environment.*

- xxi) Article 75: *provides for Control, Monitoring and Inspection.*
- xxii) Article 79: *Enterprises or operations that excessively pollute environment are subject to inspection by competent experts. The owner of the enterprise or operations meets expenses of such an inspection. The procedure through which such an inspection is conducted is specified by the order of the Minister having environment in his or her attributions. Findings of such an inspection are transmitted to the competent authorities.*
- xxiii) Articles 80 – 94: *lists the prohibited activities (e.g. waste creation and poor waste management) waste that impact negatively on the environment.*
- xxiv) Articles 95 -115: *elaborates punitive sanctions against activities that adversely impact on the environment e.g. waste creation and poor waste management)*

These provisions of the Organic Law (No 04/2005) are relevant in guiding the Environmental Impact Assessment for Waste Management Projects and waste generating activities in Rwanda to ensure safety, health and environmental conservation.

Apart from the Organic law there are other legislative instruments and various socio-economic development strategy documents whose relevance to Waste Management varies depending on each particular project activities or location. These include:

- i) Law No 16/2006 of 03/04/2006 on organisation, operation and attributions of the Rwanda Environment Management Authority (REMA).
- ii) Organic Law No 29/2005 of 31/12/2005 determining the Administrative Entities of the Republic of Rwanda, including all annexes.
- iii) Law No 08/2005 of 14/07/2005 determining the use and management of Land in Rwanda.
- iv) Ministerial Order of 9/8/2004 Bans of the manufacture, importation, use and disposal of plastic bags/containers.
- v) Environmental Regulations (Collection, Storage, Treatment, Use and Disposal of Solid waste).
- vi) Refuse Collection Regulations, bylaws and Ordinances made by relevant Local Authorities.
- vii) Environmental Regulations (Management and Disposal of Wastewater).
- viii) Environmental Protection (Standards for Hazardous waste) Regulations.
- ix) Environmental Protection (Standards of Effluent Discharge Permit) Regulations.
- x) Environmental Protection (Standards of Effluent for use in Irrigation) Regulations.
- xi) Environmental Protection (Drinking Water Standards) Regulations.
- xii) Environmental Protection (Standards for Air) Regulations.
- xiii) Disaster Policy Framework (2003).
- xiv) Sectoral Policy on Water and Sanitation (October 2004).
- xv) The enacted law on Mining and Quarry Exploitation.

Others relevant national policy documents that provide for the protection of the environment from pollution include:

- i) The Rwanda Investment And Exports Strategic Action Plan, 2005-2007” and “Vision 2020” call for a well regulated environment management system that takes into account principles of sustainable development while at the same time contributing to poverty reduction.
- ii) Agricultural policy (July 2004) recognises the need for the protection against land, water and soil degradation of pollution.
- iii) Strategic Plan for Agriculture in Rwanda (October 2004) in section 8.2 (345 -347) recognises the need for the protection of environment, water and land.

### **2.3 Institutional Responsibility**

The Ministry of Natural Resources (MINIRENA) is government lead ministry for environmental management in Rwanda. To implement MINIRENA’s sectoral strategies other Ministries are involved such as MINAGRI, MINICOM, MININFRA, MINALOC, MINECOFIN, MINJUST, MIGEPROFE, MINISANTE, MINEDUC are all involved to ensure sustainable development in line with the efforts of achieving Millennium Development Goals (MINECOFIN, 2007).

Other important institutions for environmental management in Rwanda, Rwanda Authority for Tourism and National Parks (ORTPN), Rwanda Bureau of Standards (RBS), the National University of Rwanda (NUR), Kigali Institute for Science, Technology (KIST), Rwanda Institute for Agricultural Science (ISAR), Institute for Scientific and Technological Research (IRST). Non-Governmental Organisations (NGOs) and partner agencies are also involved in environmental management activities in Rwanda. Some of these institutions are Global Environment Facility (GEF), United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), United Nations Food and Agriculture Organisation (FAO), United Nations Children’s Fund (UNICEF), United Nations Population Fund (UNFPA), USAID and the World Bank (WB).

The key stakeholders in the waste management EIA are listed in table A10 in Appendix IX. Apart from MINIRENA and REMA there are other government agencies and institutions that are public and private are involved in waste management or waste generating activities. However municipalities, industries and the agricultural sector will have a big role because of the volumes and characteristics of the wastes that they generate and manage. The key environmental management institutions have the following responsibilities:

**REMA:** Mandated by law, REMA has the responsibility to organise the EIA procedure by undertaking screening, guiding developers on assessment procedures, conducting public hearings, reviewing EIA reports based on the terms of reference (ToR) and taking decisions on approval or disapproval of proposed projects. Within the Government of Rwanda framework to streamline regulatory requirements for greater efficiency in business and investment development, REMA has delegated this responsibility to the RDB Environmental Compliance, Awareness and Cleaner Production unit. This unit is hosted within the Business

Operations and Services division of RDB. However, REMA retains the overall responsibility for monitoring the implementation of environmental protection measures recommended by EIA studies. REMA advises the Government on legislative and other measures for the management of the environment or the implementation of relevant international conventions, treaties and agreements in the field of environment.

**MINAGRI:** It is in charge of agriculture. It is also the lead agency for the implementation of Agricultural policy (July 2004) that recognises the need for the protection against land, water and soil degradation or pollution. Since agriculture has associated waste generation which in some cases can be hazardous, MINAGRI has the responsibility to guard against environmental degradation from agricultural activities that generate wastes.

**Districts:** The districts with advice from committees responsible for the protection of the environment implement decentralised environmental protection and management activities. Waste management is a key decentralised activity which the districts have to plan and implement its management.

**Developers:** The developer has direct responsibility for the project and should provide necessary information about the project at all stages of the EIA process. Developers hire experts to undertake EIA studies on their behalf and answer questions about potential impacts and proposed mitigation recommendations at public hearings. Developers have the responsibility to implement the environmental management plan including mitigation measures as proposed in the EIA report and carry out subsequent environmental monitoring and auditing.

**EIA Experts:** EIA experts are professionals registered with the Environmental Compliance, Awareness and Cleaner Production unit in the Business Operations and Services division of RDB to undertake impact studies as the REMA delegated agency for administering EIA. It should be noted that REMA is currently preparing regulations for the certification, registration and code of good practice for EIA experts. These regulations will help the developer to carry out EIA, design mitigation measures, prepare EIA report, and design environmental management and monitoring plans.

**Lead Agencies:** Lead agencies such as government ministries or departments have the responsibility for management and protection of environmental resources, public health and socio-economic development. Lead agencies are responsible for the EIA of projects under their sectors. They provide valuable technical information to EIA experts during EIA studies and are involved in the review process. Key lead agencies in waste management are government agencies such as MINIRENA, MINAGRI, MINALOC, MINISANTE, urban authorities (e.g. KCC) and MINIFRA.

**The Public:** Communities have a right to take part in the EIA process. Public participation allows important social and environmental problems to be identified and gain consensus on the nature and adequacy of proposed mitigation measures and recommendations. The role of the public in the EIA process includes contributing information and advice to EIA studies



during scoping and public hearing process. The public also advises project developers and REMA on approaches to avoid, minimize or compensate for adverse environmental impacts.

**International Funding Organisations:** All international funding organisations require EIA for projects they are to fund and especially those in which the impacts may be substantial.

**Academic Institutions:** Members of academic institutions are commonly co-opted on EIA Technical Committees. They also institutionalise environmental education in their curricula. In this case integrated waste management should be included in the curricula. Developing training modules for both EIA and waste management and implementing training programmes could be done by academic institutions liaising with REMA.

## **PART III: GUIDELINES FOR WASTE MANAGEMENT ENVIRONMENTAL IMPACT ASSESSMENT**

### **3. INTRODUCTION**

EIA is a systematic step by step process that is initiated by the proponent/developer and it involves many stakeholders whose contributions are vital to cause informed decision on a proposed project. The steps of carrying out EIA are outlined here below and summarized by Figure 2.1.

#### **3.1 Project Brief**

A developer is required to prepare a project brief which is a description of the project. This is background information on the project for consideration by REMA. The EIA process normally begins once the developer has submitted the project brief to REMA for screening. Project brief format is presented in Appendix I (also see general Guidelines for EIA, REMA 2006 section 2.1).

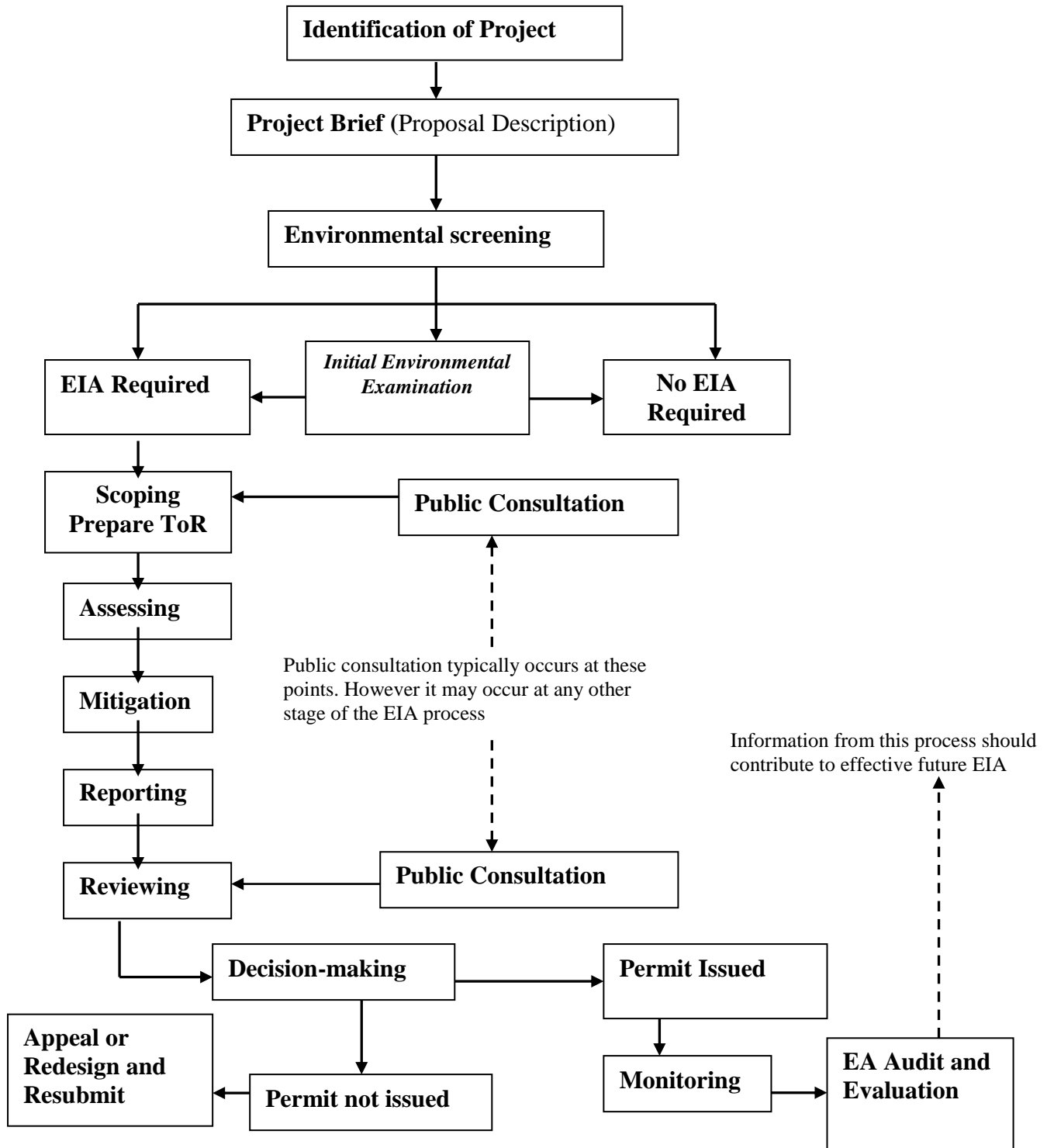
#### **3.2 Screening**

This is the task of deciding whether or not an EIA is required for a particular project. Basic details of the proposed development will be needed for the project to be screened. Screening results in the categorization of the proposals in three categories:

- i) No EIA required (Project Exempted).
- ii) Initial Environmental Examination (IEE) required for confirmation if EIA is required or not.
- iii) Full EIA required.

Appendix III presents key steps in screening projects. For waste management factors like the category of waste (e.g. hazardous, toxic, etc), characteristics (organic, inorganic, biodegradable, etc), waste generation rate, the size of the population to be served by the project or impacted by the project and project location are the critical information required to determine whether an EIA is necessary. The general Guidelines for EIA in Rwanda (REMA 2006) in Appendix 2 provide the general criteria for screening. The Ministerial Order establishes the list of works, activities and projects in Rwanda that have to undertake Environmental Impact Assessment. However every project will have unique associations to require screening. A summary of information on screening is provided in the Table 2.1.

**Figure 2.1: Steps in carrying out EIA displayed as a Flow Chart**



**Table 2.1: Summary information on screening**

Screening	Typical proposal that require full-scale EIA	Screening methods	Screening information required by decision-makers	Typical project list categories
<p>It is a process for determining whether or not a proposal requires full-scale EIA and the level at which the assessment should occur</p>	<ul style="list-style-type: none"> <li>• Natural resources exploitation that release wastes (e.g. mining and quarry)</li> <li>• Oil exploration and mining</li> <li>• Infrastructure development</li> <li>• Agriculture and agro-industry</li> <li>• Industrial activities</li> <li>• Extractive industries</li> <li>• Waste management and disposal ( landfill, transfer stations, wastewater treatment, large incinerators, hazardous waste)</li> <li>• Storage of wastes</li> <li>• Waste transportation</li> <li>• Trade in waste</li> </ul>	<ul style="list-style-type: none"> <li>• IEE</li> <li>• Project lists -inclusive</li> <li>• Exclusive list</li> <li>• Decision-makers' discretion</li> </ul>	<ul style="list-style-type: none"> <li>• Information on the proposal and its potential impacts</li> <li>• Level of confidence of predictions-impacts</li> <li>• Characteristics of the environment and its resilience</li> <li>• Planning, environmental management and decision-making framework</li> <li>• Degree of public interest</li> </ul>	<ul style="list-style-type: none"> <li>• Full-scale EIA required</li> <li>• Some further environmental analysis required</li> <li>• No EIA required</li> </ul>

If a decision is made at screening stage to exempt a project, or to approve its environmental aspects on the basis of identified mitigation measures, such a decision shall be taken by the Authority (REMA).

If, however, after screening, it is determined that the project requires a detailed Environmental Impact Study, a certificate shall only be issued after approval of the Environmental Impact Assessment. See also section 2.1.2 of the General EIA Guidelines for Rwanda that lists the project categories (IL1, IL2 and IL3).

### **3.3 Scoping**

Scoping which is the identification of potential environmental impacts, is an important early stage of the EIA process.. For a project to be properly scoped, a site visit and preliminary consultations with relevant regulatory authorities (e.g. REMA, MINIRENA) and lead agencies (e.g. MINAGRIC, MINALOC, MINICOM, etc) must be done. Ideally public consultation should also be carried out at this stage. Consultations should involve exchange of information about the characteristics of the proposed project, and assistance to the consultant in identifying regional and local issues and/or sources of information of relevance to the EIA process. Questionnaire for public consultation is in appendix II. From consultations and a preliminary assessment of baseline conditions the consultant must:

- i) Identify the characteristics of the proposed development that are likely to give rise to impacts.
- ii) Identify what type of impacts that may arise that need to be addressed in the EIA study.
- iii) Determine which environmental resources and people in the vicinity of the proposed site are likely to be particularly sensitive to the above impacts, and what categories of impacts are likely to be a problem in this respect.
- iv) Suggest delineation of the appropriate boundaries to be considered in the EIA Study.
- v) Provide questions about the proposed project which should be answered through the EIA Study.
- vi) Give alternatives to the proposed action.
- vii) Indicate the full range of stakeholders to be consulted and suggestions for full public involvement in the process.
- viii) Identify the full range of stakeholders who may be affected or are interested in the proposed project.
- ix) Provide other technical aspects related to the proposed action.
- x) Identify other past, or foreseeable future projects in the area that may be impacted upon by, or will impact on the proposed project; and
- xi) State how the proposed project conforms to existing laws, policies and regulations.

In case the project characteristics or the boundaries of the proposed site changes, then the potential impacts may also change, and the scope of the EIA will need to be reviewed.

There are generally benefits from focusing attention on the key issues of concern. Not all issues identified will have the same degree of relevance for all proposals. The identification and prioritization process should therefore result in:

- i) A list of all issues with a preliminary estimate of the relative significance of their impacts.
- ii) Identification of the key issues.
- iii) An explanation as to why other issues are not considered to be very important in the proposal.

The EIA should address the key issues as fully as practicable. However the level of analysis should reflect the level of significance of the impacts and their importance for the proposal. Lesser attention should be given to those issues which have lesser significance. For significant issues, there should be sufficient analysis to develop a sustainable mitigation strategy for any potential adverse impacts. The consideration of alternatives, particularly alternative sites or schemes, during the scoping stage is important. The scoping report should indicate why the preferred alternative was chosen on environmental grounds. The main part of the EIA can then concentrate on the preferred option. Terms of Reference (ToR) for the EIA study, is produced at this stage of the EIA process. Appendix VIII of these guidelines provides the format for ToR. Guidelines for preparation of ToR are in appendix 4 of the General Guidelines for EIA for Rwanda.

The scoping exercise shall conclude with the identification of the relevant interdisciplinary expertise necessary to address the identified significant impacts. The names and qualifications of the experts identified to undertake the Environmental Impact Study shall be approved by REMA or the Environmental Compliance, Awareness and Cleaner Production of RDB. Summary of information on scoping is provided in the Table 2.

**Table 2: Summary information on scoping**

Scoping	Purpose of scoping	Steps in scoping process	Who is involved in scoping	Outline of ToR
<ul style="list-style-type: none"> <li>• A process of interaction</li> <li>• Identifies               <ul style="list-style-type: none"> <li>i. Boundaries of EIA study</li> <li>ii. Important issues</li> <li>iii. Information for decision-making</li> <li>iv. What to be considered during EIA</li> </ul> </li> <li>• Identifies concerns, evaluates, organizes, presents to assist decision-making</li> </ul>	<ul style="list-style-type: none"> <li>• Consider project alternatives</li> <li>• Inform affected public</li> <li>• Identifies impacts</li> <li>• Understand local values</li> <li>• Evaluated concerns</li> <li>• Define EIA boundary</li> <li>• Determine methodology and consultation procedures</li> <li>• Establish ToR for EIA</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare outline of the EIA scope</li> <li>• Develop the scope through informal discussion</li> <li>• Make the draft scope widely available</li> <li>• Identify issues of concern</li> <li>• Evaluate concerns</li> <li>• Incorporate concerns</li> <li>• Develop strategy for addressing concerns</li> <li>• Provide feedback</li> </ul>	<ul style="list-style-type: none"> <li>• The Proponent</li> <li>• The Authority</li> <li>• Lead Agencies</li> <li>• Environmental Practitioners, Experts, consultants</li> <li>• Those affected by the project</li> <li>• The wider community</li> </ul>	<ul style="list-style-type: none"> <li>• Background to the proposal</li> <li>• Context of the issues</li> <li>• Alternatives</li> <li>• Institutions and public involvement</li> <li>• Required information</li> <li>• Analysis of impacts</li> <li>• Mitigation and monitoring</li> <li>• Conclusions and recommendations</li> <li>• Requirements for managing the EIA</li> </ul>

Suggested format for TOR for Waste Management EIA is in appendix VIII.

### **3.4 Baseline Environmental Conditions of the proposed Project**

Based on the information from the scoping exercise as contained in the Terms of Reference, an Environmental Impact Study shall be conducted and an Environmental Impact Statement (EIS) will be prepared. The ToR produced during scoping should be adhered to strictly from this stage of EIA till submission of the EIS.

Data already existing should be obtained as the first step in collection of baseline information. It can then be reviewed for its relevance to the proposed project and used as a basis for determining what survey work may be needed. Original data is required on air quality, odours and noise; socio-economic situation; water quality, soil quality and aquatic biology; terrestrial ecology; landscape. Original surveys should be conducted initially at a general level to identify whether more detailed survey will be required. The waste management EIA will consider specific issues during the assessment and reporting (Table 3).

Data collection must focus on the key issues needing to be examined for the EIA (identified during the Scoping process), and should be collected at the appropriate time(s) of year taking into consideration seasonal climatic variables. Consider the likely monitoring requirements during survey planning, so that the data collected is suitable for use as a baseline to monitor impacts and mitigation measures in the future.

Assess the need for long-term sampling as early as possible. Carry out data collection in a sufficiently wide area to ensure adequate coverage for monitoring. For example, watercourses (e.g. rivers) should be assessed as far up and downstream as necessary to assess to enable good future monitoring of beneficial or deleterious changes in water quality or aquatic biota. The distances involved will depend on the characteristics of any existing waste dumping, landfills or discharge close to the watercourse(s) in question, and on the location and characteristics of other discharges affecting the watercourse(s).



**Table 32: Issues to be considered in doing Environmental Impact Assessment** (source Uganda EIA Regulations 1998 with modifications)

<b>Issues to be considered in doing Environmental Impact Assessment</b>	
<b>1. Ecological Considerations</b>	
(a) Biological diversity including impacts on:	
i. Breeding habitats, refugia, ecosystem of wild animals and vegetation (e.g. terrestrial, aquatic, forest and wetland)	
ii. Gene pool of plants and animals.	
(b) Sustainable use including effect of proposal on:	
i. Soil quality	
ii. Water quality	
iii. Air quality	
iv. Breeding of fish and game or wild animals.	
v. Natural regeneration of woodland, forests, wetlands and their sustainable yields	
vi. Water resources and uses; wetland resources and wise use of wetlands, land use	
(c) Ecosystem maintenance including effects on:	
i. Food chains and Nutrient cycles	
ii. Aquifer pollution, pollution of water run-off, rates, etc	
iii. Area extent of habitats and Fragile ecosystems (water, wetlands, lakeshore, riverbanks, soils)	
<b>2. Social considerations including effects on</b>	
i. Employment and livelihood	
ii. Social cohesion or disruption	
iii. Human health	
iv. Immigration or emigration	
v. Communication – roads opened, closed, re-routed, etc	
vi. Local economy	
vii. Culture and cultural values	
viii. Aesthetics	
<b>3. Accident and Safety</b>	
i. Toxic Gaseous emission	
ii. Gas explosion risks	
iii. Poisoning of humans and animals by contact	
iv. Greenhouse gases and ozone depleting substances	
v. Hazardous wastes	
<b>4. Landscape</b>	
vi. Views opened or closed	
vii. Visual impacts (features, , waste piles, aesthetics, etc)	
viii. Compatibility with surrounding area	
ix. Amenity opened or closed	
<b>5. Land uses</b>	
i. Impacts on current land uses	
ii. Possibility of multiple use	
iii. Effects on surrounding land uses and land use potentials	

### **3.5 Prediction of Impacts**

Impact prediction must encompass the whole waste management cycle from waste generation, temporary storage, transportation, landfill (construction and operation) for solid wastes and for wastewaters sewerage network, construction and operation of the wastewater works. Impacts should be quantified wherever possible, or fully described if not quantifiable. The following regarding impacts should be considered:

- i) Nature (positive, negative, indirect, direct) of impact.
- ii) Magnitude of impact.
- iii) Duration (short term, long term, intermittent, continuous) of impact.
- iv) Extent and location (area/volume covered, where impact occurs) of impact.
- v) Whether impacts are reversible or permanent.
- vi) Timing (the different phases of the project and time of the day or months of a year) of impact.
- vii) Likelihood (risk, uncertainty or confidence in prediction) of impact.
- viii) Significance (local, regional, global) of impact.

Impacts on the following specific aspects of the physical, socio-cultural and biological environment must be assessed:

- i) Water quality (surface and groundwater pollution).
- ii) Air quality (odour, dust, aerosols, CFCs/ODS, GHGs).
- iii) Social, economic and cultural environment.
- iv) Waste management (pre project waste management activities e.g. the Kigali solid waste dump site).
- v) Flora and fauna.
- vi) Transportation and access.
- vii) Hydrology and groundwater.
- viii) Visual environment, aesthetics and landscape.
- ix) Risk and hazards (accidents. contamination. infections such as hepatitis, cholera. other health issues, etc).

Impacts of the scheme as proposed should be clearly identified, so that if for any reason mitigation is not implemented, the consequences will be clearly identified in the EIA. The impacts and the assigned mitigation measures must be presented clearly for easy understanding and adoption of the mitigation measures.

### **3.6 Evaluation**

Criteria for evaluation of impacts must be stated. Where possible, legislative standards or international standards should be followed (e.g. discharge standards, waste management regulations, etc). If no suitable standards exist, descriptive criteria may be used, but must be fully explained. Evaluation of significance of impacts should take account of the magnitude, duration and extent of impact, and whether the impact is temporary or permanent. The consultant should identify and, where possible, quantify the level of

uncertainty associated with these predictions. Some indication of probability of occurrence of impacts should also be included.

### **3.7 Mitigation**

Mitigation strategies must be considered both in relation to individual impacts and collectively for all impacts. Many mitigation measures can be incorporated into the early design stages of the project by regular communication between the consultant and developer or designer of the project.

Reporting of mitigation should include such specific features which have been incorporated during the planning and design of the proposed development. Where mitigation has not already been incorporated into the design or siting of the proposed project during the EIA process, or specific commitment to mitigation measures from the developer has not been obtained, mitigation measures should be included as recommendations, and should be clearly stated as such.

Mitigation must cover all the phases of the project (construction, operation/implementation and decommissioning). The whole waste management chain from generation, removal, transportation/conveyance, treatment and or final disposal must comply with the national environmental regulations. In cases where licenses or permits are required they must be obtained before implementation of the project. For solid wastes recommendations for monitoring impacts in the form of an environmental management plan (EMP) should be included.

### **3.8 EIA Report**

Details of EIA report preparation is provided in appendix X of these guidelines for waste management EIA, where all the sections of the report are discussed to help on the report preparation.

### **3.9 Review**

Review of the EIA Report /Environmental Impact Statement (EIS) is usually done by the authority (REMA), a government lead agency or an independent panel of reviewers. In this review, the level of address of the Terms of Reference set out for the study shall be considered. After reaching a decision on the proposed action, if it is approved, the developer will be licensed or permitted to implement the project in accordance with the mitigation measures stipulated in the Environmental Impact Statement and any other terms and conditions attached to the approval. If it is denied, the developer may, if such denial is based on environmental considerations that can further be improved, be urged to revise the proposed action to eliminate adverse impacts. The developer may appeal against the decision in line with the provisions of the Organic Law.

### **3.10 Monitoring and audits**

Monitoring is normally adopted as a mechanism to check that conditions imposed on the project is being enforced or checks the quality of the affected environment. Audits are a periodic assessment to test the accuracy of impact predictions and check on environmental management practices for compliance with statutory requirements.

### **3.11 Decommissioning**

For various reasons a project may be decommissioned. The decommissioning may have impacts on the environment that have to be understood in order to put in place adequate mitigation measures. The impact may be caused by items such as written off equipment, chemicals, physical structures, etc of the project if they are just abandoned on site without proper management. An environmental assessment of the decommissioning process will provide adequate mitigation measures.

### **3.12 Cost of EIA**

Article 69 of the Organic Law (Nº. 04/2005 of 08/04/2005) indicates that environment impact assessment shall be carried out at the expense of the developer. Upon project approval, a developer is required to pay an administrative fee to the environmental fund (FONERWA) to be determined as a percentage of the estimated cost of the investment.

### **3.13 Professional expertise required for the waste management EIA**

Conducting EIA on waste management projects requires a team that should include, but not necessarily be limited to the following:

- i) Environmental specialist.
- ii) Waste management or pollution assessment expert (expertise in the waste category being assessed e.g. solid waste, sewage treatment, medical waste, etc).
- iii) Environmental Lawyer.
- iv) Health (public health, occupational health) specialist.
- v) Environmental engineer.
- vi) Aquatic biologist, microbiologist or biochemist.
- vii) Socio-economics specialist.
- viii) Terrestrial ecologist.
- ix) Process engineer in wastewater treatment.
- x) Hydrologist/hydro-geologist.
- xi) Development planner or landscape architect.
- xii) Air quality (odour, dust and noise) specialist.
- xiii) Transport/roads specialist (e.g. for effective and efficient routing of waste transport system).
- xiv) Antiquities specialist.

The composition of the EIA team will vary depending on the project type and complexity of the waste management. Some team members may fulfil several of the above roles if suitably qualified and experienced. Each member of the team, for their specialist subject(s), will follow the basic processes identified above namely: *screening, scoping, consultation, baseline data collection, prediction and evaluation of impacts, and identification of mitigation measures*. The Basic minimum academic requirement is a University degree or its equivalent from recognised higher institutions of learning.

## Appendix I: Project Brief format

The developer/Proponent shall submit a project brief containing the following information to Environmental Compliance, Awareness and Cleaner Production of RDB:

1. Name and title, address of developer
2. Name, purpose, objectives and nature of the project:
  - a. Outline of the project including size of project.
  - b. Design and activities that shall be undertaken during and after the implementation of the project.
  - c. Inputs (e.g. raw materials, energy, etc) and products (e.g. compost/manure, bags, sludge, textile etc) and, sources of inputs etc.
3. Spatialized description using Geographic Information Systems and Remote Sensing as appropriate, of the proposed project site and its surroundings, and alternative sites, if any:
  - a. Geographical area to be affected – boundaries, area to be directly impacted.
  - b. Flora and fauna.
  - c. Hydrology and meteorological information.
  - d. Topographic information.
  - e. Land use in and surrounding the site.
4. Description of how the proposed project and its location conform to existing laws, regulations and policies governing such project and the use of the site/area proposed for the project.
5. Description of any likely environmental impacts that may arise due to activities of the various phases/stages of the project and proposed mitigation measures.
  - a. Site preparation: actions needed to prepare the site for the intended use (e.g.: blasting, vegetation removal, grading, filling, etc.);
  - b. Construction practises: specific construction techniques to be used with focus on any potential impacts of construction (e.g. noise, dust etc) and other requirements for workers (e.g. housing, transportation, etc);
  - c. Operation: during the operation of the projects impacts may be odours, pollution of water and land, noise, etc.
6. Description of any other alternatives which are being considered (e.g. siting, technology, construction and operation procedures, sources of waste materials, handling of wastes, etc.).
7. Any other information that may be useful in determining the level of EIA required.
  - a. The built facilities: specific description of any buildings or related facilities that will be created to meet the objectives of the project (e.g.: size);
  - b. Operations: with particular emphasis on the number of workers, their working hours, housing and transportation needs, occupational health or safety hazards, waste materials (sources and supply routes), and products (basic items and transportation needs). Any expected pollution of air, water and land from the proposed action; and

- c. Decommissioning and Restoration: plans for closure of the site and for restoration of the site to productive post-closure use.

## **Appendix II: Format of questionnaire for public hearing**

The public has a right to express their opinion in the EIA processes. There is no standard format of questionnaire for public consultation however the following may be used to guide the process.

### **1. Presentation of an overview of the proposed project which should include but not limited to:**

- a. Name and title, address of developer
- b. Name, purpose, objectives and nature of the project

After the overview presentation the public may be guided to assess the following sections (2 to 6) and express their opinion.

### **2. Project impacts:**

- a. Are there identified impacts on any environmentally sensitive areas (e.g. wetlands, lakes, rivers, steep slopes, conservation areas, etc)?
- b. Have all impacts been considered (social, economic, cultural, biophysical, etc)?
- c. Are there explicit indications of positive impacts of the project?
- d. Have offsite (e.g. downstream and upstream) effects of the project been considered?
- e. Have transboundary impacts been considered (if applicable)?
- f. Have cumulative impacts been considered and the nature of impacts clearly stated?
- g. Are there additional impacts to be considered?

### **3. Mitigation measures:**

- a. What mitigation measures are proposed? Are they relevant?
- b. Are experiences from previous similar project adequately used in this EIA?
- c. Have concerned population and other groups been involved and have their concerns been adequately addressed by the project preparation?
- d. If settlement is involved, is it clearly and adequately provided for?
- e. If compensation is involved, are adequate compensatory measures provided for?
- f. Are there additional mitigations to be considered?



#### **4. EIA Procedure:**

- a. Has the Waste Management EIA Guidelines been adequately used?
- b. Have the national policies and other statutory requirements been adequately addressed by the project and EIA?
- c. In which phases of the decision-making process has environmental assessment been included? Where they the appropriate stages?
- d. Is there an economic analysis of the project that also assesses the environmental impacts?
- e. Have there been adequate consultations (e.g. community, lead agencies, other stakeholders)?
- f. Are there any identifiable gaps in the EIA process?

#### **5. Project alternatives:**

- a. Have all the possible project alternatives been addressed?
- b. Are the impacts of the alternative adequately analyzed?
- c. Are the selected alternatives the best?
- d. What additional alternatives should be included?

#### **6. Project Implementation:**

- a. Are there adequate capacities for implementing the EIA recommendations?
- b. Have the responsibilities for project implementation including impact mitigation and monitoring been clearly stated?
- c. Is there a clear Environmental Management Plan for the proposed project?
- d. Is the developer committed to the suggested environmental management suggestions?
- e. Are there any suggestions to improve on environmental management within the project?

## **Appendix III: Screening Process in EIA**

### **1. Methods used in the Screening**

Screening is that part of the EIA process which determines whether an EIA is required for a particular project. A number of steps are involved in deciding whether EIA is required for a proposed project. Explanation of each step (1-5) during screening is given below. The process should be followed through until a decision is made on whether or not EIA is required.

#### **Step 1 - Is the Project listed under Article 2 of the Ministerial Order establishing the list of works, activities and projects that have to undertake Environmental Impact Assessment?**

The first step in the screening exercise is to determine whether the project (components) is listed under either in the above Article, Appendix V of the guidelines for EIA of waste management or in The World Bank Category A or B projects.

In summary, if a project is not of a type listed in the Ministerial Order, these EIA guidelines or The World Bank Category A and B projects, EIA is not required, unless a special reason exists for further environmental examination of the project.

#### **Step 2 - Is the Project on a Mandatory List Requiring EIA?**

The second task is to determine whether there is a mandatory requirement for EIA. An EIA will be required if the project is listed under mandatory list for EIA (Appendix V of the Waste Management EIA Guidelines or if it is in the World Bank Category A and B list of projects). In summary, if a project is on a mandatory list then EIA will be required.

#### **Step 3- Is the Project on an Exclusion List exempting it from EIA?**

This step is used to check whether there is any legal exemption for the project. Some projects may be classified by the state as emergency activities that require quick response and delay may cause disaster. These are set out in exclusion or negative lists of projects. If a project is on an exclusion list EIA will not be required.

A country's legislation may provide for exceptions to exclusion lists if the project is in a specified sensitive location. Such an exception would apply if the project were likely to have significant effects on a sensitive environment (e.g. homes, schools, rivers, wetlands, lakes, groundwater, lake shores, river banks, etc). State legislation must also be checked to determine any other locations defined as sensitive in which an exclusion list would not apply.

#### **Step 4 - Case-by-Case Consideration: Is the Project Likely to have Significant Effects on the Environment?**

Mandatory and exclusion lists are designed to simplify the process by identifying thresholds and criteria defining projects, which are always or are never considered likely to have significant effects on the environment. If a project is not on a mandatory or exclusion list a screening decision must be made on a case-by-case basis.

In undertaking case-by-case screening, the following information is required for decision-making:

- i) Information about the proposal/project and its potential impacts.
- ii) Level of confidence in impacts.
- iii) Characteristics of the environment at location and its surrounding environment and the resilience to change.
- iv) Planning, environmental management and decision-making framework
- v) Degree of public interest.

Also considered in the screening analysis are the project size, type and location relative to the sensitive ecosystems and the environment. In addition such guidance may refer to indicative thresholds and criteria. This is used to check project activities/components that do not appear on the mandatory and exclusion lists.

In summary, where it is decided that a project is likely to have significant effects on the the environment through a case-by-case examination, then EIA will be required.

#### **Step 5 – Recording Screening Decision**

After the screening process, the authority will make a final decision and the developer will be informed in writing. Screening decision is made based on findings of steps 1 through to 4 above. In the screening process the Authority may consult the lead agencies to discuss the proposed project.

#### **Professional judgment**

Based on the professional experience the authority and the screening team can make judgement to predict the magnitudes of the impact of the project on the environment and decide the levels of EIA required for the project. The following should be considered during screening:

- i) Identification of assessment issues and the selection of Valued Environmental Components (VECs).
- ii) Establishment of study boundaries and criteria for the assessment of the significance of environmental effects for each of the VECs.

- iii) Identification of past, present and likely future waste management projects that could result in cumulative environmental effects in combination with the project.
- iv) Identification of project-environment interactions and likely environmental effects.
- v) Assessment of the significance of residual environmental effects. and
- vi) Determination of the need for further environmental study (EIA) or no EIA.

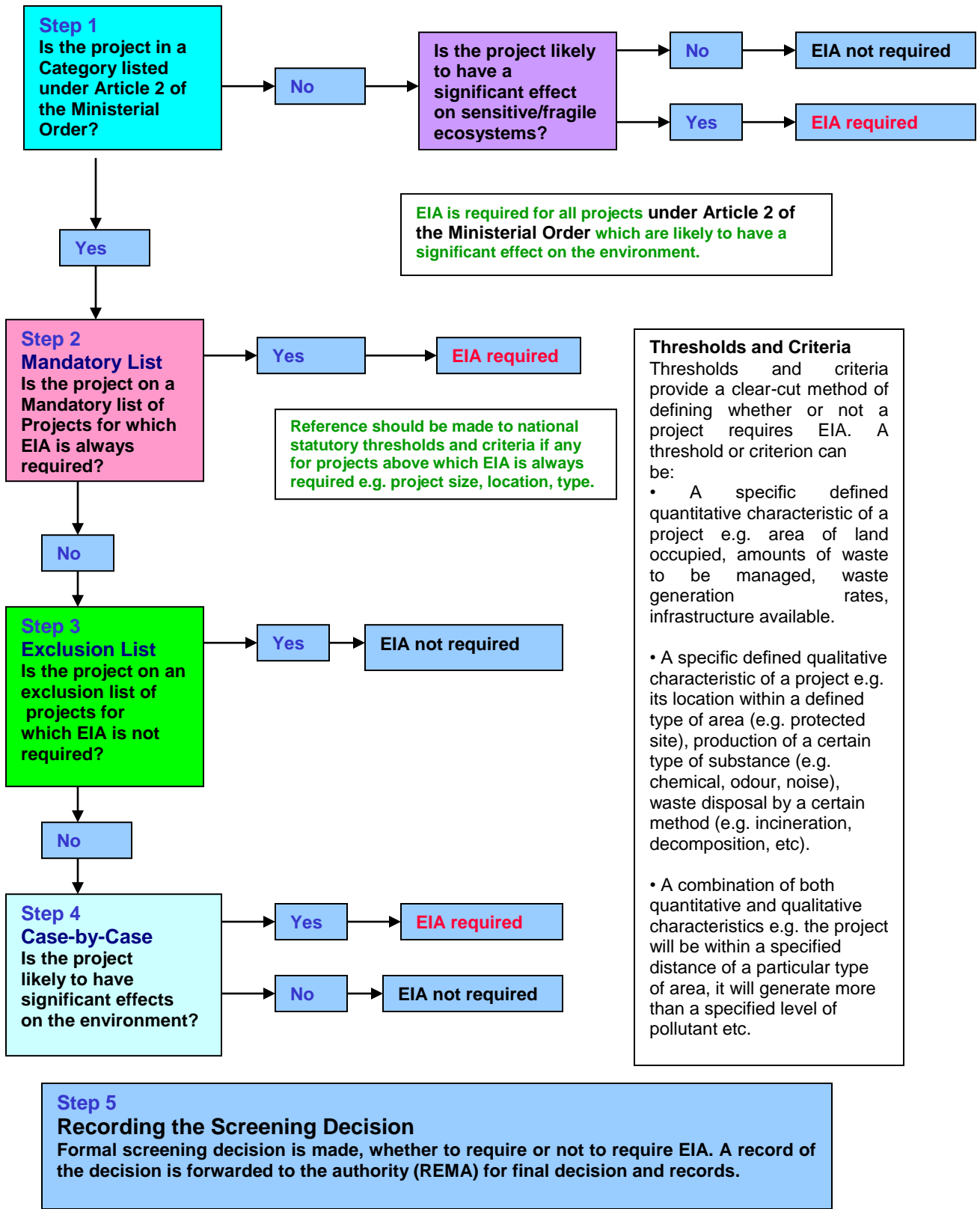
The analysis should consider the project-related environmental effects, cumulative environmental effects, and the incremental environmental effects of the continued operation of the project. The analysis should also provide an integrated evaluation of project-related and cumulative environmental effects.

Valued environmental components that should be considered in the screening exercise are:

- i) Atmospheric Environment.
- ii) Aquatic (water) Environment (surface water and groundwater).
- iii) Sensitive environment (e.g. Homes, leisure facility, schools, nature conservation areas, wetlands, hills, slopes, lakeshores, river banks, forest, etc).
- iv) Terrestrial Environment.
- v) Public and Worker Health and Safety.
- vi) Socio-economic conditions.

The screening process follows logical series of steps as described above in steps 1-5. These screening steps are summarised below in Figure AI.

**Figure AI: Diagrammatic flow of decision making steps in screening**



## Screening results

The result of the screening should clearly describe the path followed in Figure AI to arrive at the screening decisions. Checklist such as the one displayed by Table A.I and appendix VI can be used to explain the screening results. An example of checklist that can be used during screening is in table A1.

**Table A1. Screening checklist results**

<b>Brief Project Description:</b>		
<b>Questions</b>	<b>Yes / No /? Briefly describe</b>	<b>Is this likely to result in a Significant effect? Yes/No/? - Why?</b>
1. Will the Project involve actions which will cause physical changes in the locality (Topography, land use, changes in water bodies, etc)?		
2. Will the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?		
3. Will the Project involve use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?		
4. Will the Project release pollutants or any Hazardous, toxic or noxious substances to air?		
5. Will the Project cause noise and vibration?		
6. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater?		
7. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?		
8. Will the Project result in social changes, for example, in demography, traditional lifestyles and employment		
9. Are there any other factors such as the potential for cumulative impacts with other existing or planned activities in the locality?		
10. Are there any areas on or around the location which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the		

<b>Brief Project Description:</b>		
<b>Questions</b>	<b>Yes / No /? Briefly describe</b>	<b>Is this likely to result in a Significant effect? Yes/No/? - Why?</b>
project?		
11. Are there any other areas on or around the location which are important or sensitive for reasons of their ecology e.g. rivers, lakes, wetlands, groundwater, forests or woodlands, which could be affected by the project?		
12. Are there any areas on or around the location which are used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, migration, which could be affected by the project?		
13. Are there any areas or features of high landscape or scenic value on or around the location, which could be affected by the project?		
14. Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?		
15. Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected by the project?		
16. Is the project in a location where it is likely to be highly visible to many people?		
17. Are there any areas or features of historic or cultural importance on or around the location, which could be affected by the project?		
18. Is the project located in a previously undeveloped area where there will be loss of virgin green land?		
19. Are there existing land uses on or around the location e.g. residences, gardens, private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining or quarrying which could be affected by the project?		
20. Are there any plans for future land uses on or around the location, which could be affected by the project?		
21. Are there any areas on or around the location which contain important,		

<b>Brief Project Description:</b>		
<b>Questions</b>	<b>Yes / No /? Briefly describe</b>	<b>Is this likely to result in a Significant effect? Yes/No/? - Why?</b>
high quality or scarce resources e.g. groundwater, surface waters, forestry, agriculture, fisheries, tourism, minerals, which could be affected by the project?		

*When using these screening guidelines also refer to project screening criteria found in Appendix 2 of the General Guidelines for EIA for Rwanda (REMA, 2006).*



## **Appendix IV: Guidelines for Waste Management**

### **1. General**

1.1 The Appendix describes the commonly adopted approaches and methodologies for assessment of waste management arising from projects. The methodologies may vary from case to case, depending upon the nature of wastes and the latest development in methods and techniques.

### **2. Projects with Special Requirements for Waste Disposal**

2.1 The projects that need special requirements for waste disposal are but not be limited to, the following:

#### **a. Chemical Waste Producing Industries:**

- i) Textile (including dyeing, bleaching and finishing).
- ii) Tannery and leather finishing.
- iii) Motor vehicle and machine servicing workshops.
- iv) Electricity and gas generation.
- v) Pulp and paper.
- vi) Plastics.
- vii) Metal finishing.
- viii) Electroplating.
- ix) Printed circuit board production and electronics.
- x) Film processing and development laboratories.
- xi) Chemical processing and formulation.
- xii) Land transport and shipping.
- xiii) Manufacture of professional and scientific equipment.

#### **b. Livestock Rearing:**

Cattle, pigs, chickens, ducks, geese, turkeys, pigeons other fowls generating wastes.

#### **c. Community Facilities with Special Requirements for Waste Disposal:**

- i) Abattoirs
- ii) Hospitals/clinics and other health care premises
- iii) Markets
- iv) Recreation venues such as stadium, tourism facilities, beach facilities etc
- v) Other community facilities which use ozone depleting substances or include incinerators may need special attention in the EIA processes.

#### **d. Wastewater works:**

The planning and siting of sanitary facilities especially conventional sewerage in urban areas should be done together with the urban plan or settlement plans requiring full EIA.

Major issues include:

- i) Siting of the system in relation to the environment and human settlements,
- ii) Effluents that can cause pollution( health hazard, eutrophication, fish kills, etc),
- iii) Sludge, smell, attracting birds and rodent agents of diseases and screenings
- iv) Aesthetics impacts

#### **e. Landfills:**

The planning and siting of landfill facilities in urban areas should be done together with the urban plan or settlement plans requiring full EIA. Major issues include:

- i) Siting of the system in relation to the environment and human settlements
- ii) Leachates, smell, attracting birds and rodent agents of diseases
- iii) Emissions (CO<sub>2</sub>, methane, VOCs, etc)
- iv) Aesthetics impacts

### **3. Waste Management**

Prior to considering the disposal options for various types of wastes, opportunities for reducing waste generation should be fully evaluated taking into account the following factors:

- i) Applying Cleaner Production (CP) techniques, avoiding or minimising waste generation through changing the plan and design approach in the project planning stage;
- ii) Adopting better management practices on site to reduce cross contamination and promote waste segregation during all phases of the project;
- iii) Reusing or recycling waste materials in other construction activities in all phases of the project;
- iv) Diverting waste to other projects that may require them as raw materials (e.g. for composting, recycling etc);
- v) Using recycled materials for construction as far as practicable;
- vi) Installing appropriate facilities for segregation of various types of wastes during the operational stage; and
- vii) Arranging and facilitating collection of wastes by the appropriate waste recyclers as far as practicable in the operational stage.

Having taken into account the factors above in previous paragraph, the types and quantities of the wastes generated as a consequence should be estimated and the disposal options for each type of waste described in detail. The disposal method recommended for each type of wastes should be based on the result of the assessment in section 3.3 below.

The impact caused by handling (including labelling, packaging & storage), collection, and disposal of wastes shall be addressed in detail. This assessment should cover but not limited to the following areas:

- i) Potential hazard;
- ii) Air & odour emission;
- iii) Noise;
- iv) Public health
- v) Wastewater discharge;
- vi) Leachate; and
- vii) Inconvenience to public transport.

When large quantities of wastes are identified, the impact on the capacity of waste collection, transfer and disposal facilities, especially the existing or strategic waste disposal facilities have to be assessed.

In addition to the waste management practices recommended for the project, the handling, collection/transportation and disposal of wastes, shall have to comply with the national regulations on wastes and sanitation and waste disposal laws (e.g. Ordinance, effluent standards, etc ) if in place . Typical waste management documents that should be complied with include but not limited to:

- i) Waste management policy.
- ii) Waste management regulations.
- iii) Sewerage regulations.
- iv) Wastewater discharge regulations.
- v) Solid waste management regulations.
- vi) Hazardous waste management regulations.

In case there are no national regulations then international regulations such as WHO, US-EPA, etc should be used and explicitly stated in the EIS.

## **Appendix V: Projects requiring EIA**

### **1. Introduction**

All projects listed under Article 2 of the Ministerial Order establishing the list of works, activities and projects that have to undertake Environmental Impact Assessment (infrastructure, agriculture and animal husbandry, works in parks and its buffer zones and works of extraction mines) and those generating wastes with potential significant adverse impacts on the environment and or waste management projects.

Factors that must be considered when categorising projects for mandatory EIA or exemption are:

- i) Waste composition.
- ii) Waste characteristics with respect to human impacts (e.g. toxicity, carcinogenicity, irritant, pathogenic, etc).
- iii) Waste persistence and stability in the environment (soil and water) and the food chain.
- iv) Nature of waste (e.g. flammability, corrosiveness, reactivity, explosive, radioactive, etc).
- v) Leachability of the waste and characteristics of the leachate
- vi) Degree of attenuation of the leachate within the soil-water system

### **2. Waste management projects for mandatory EIA**

- i) All waste management activities out of character with the surrounding
- ii) Any waste management structure of a scale not in keeping with its surrounding
- iii) Waste management activities with major changes in land use
- iv) Waste treatment/disposal:
  - a) Wastewater works (e.g. sewage, lagoons and trade waters).
  - b) Solid wastes (e.g. land fills, large scale commercial recycling plants, and composting works etc).
  - c) Industrial waste handling and treatment.
- v) Large scale incineration (e.g. commercial for power generation- thermal converters, incineration of hazardous wastes, etc).
- vi) Sites for hazardous wastes storage and disposal.
- vii) Major atmospheric emissions.
- viii) Waste transportation.
- ix) Non-hazardous waste storage.
- x) Hazardous waste storage (e.g. medical, toxins, expired drugs, expired chemicals, etc).
- xi) Transboundary movement of wastes.

### **3. Waste related activities for which EIA is not mandatory**

- i) Domestic waste generation activities, temporary storage, sorting, transport to community disposal points (e.g. in skips, bunkers, etc) at household level.
- ii) Institutional wastes (e.g. schools, recreation, etc) temporary storage and transport to community disposal transit points (e.g. skips and bunkers)
- iii) Household level composting of kitchen wastes (e.g. vermipost)
- iv) Household sorting and sale of recyclable wastes (e.g. old newsprints, bottles, cans, etc)

## Appendix VI: Checklists for impacts assessment of waste management projects

### 1. Solid Waste Management

SCREENING QUESTIONS	YES	NO	REMARKS
<b>A. Project Siting</b>			
Is the area --			
<ul style="list-style-type: none"> <li>Densely populated?</li> </ul>			
<ul style="list-style-type: none"> <li>Having heavy development activities?</li> </ul>			
<ul style="list-style-type: none"> <li>Adjacent to or within environmentally sensitive areas?</li> </ul>			
i. Wetlands			
ii. Lake shores or bay			
iii. River banks			
iv. Protected area			
v. Cultural heritage site			
vi. Buffer zone for protected area			
vii. Special area for biodiversity protection			
viii. Areas adjacent to steep unstable slopes			
<b>B. Potential Environmental Impacts</b>	<b>YES</b>	<b>NO</b>	
Will the project cause--			
<ul style="list-style-type: none"> <li>Impacts associated with waste transport to disposal site and treatment facility?</li> </ul>			
<ul style="list-style-type: none"> <li>Nuisance to neighbourhood due to foul odour and influx of insects (e.g. flies), rodents etc?</li> </ul>			
<ul style="list-style-type: none"> <li>Public health hazards from odour, smoke from fire and diseases transmitted by flies, insects, birds and rodents?</li> </ul>			
<ul style="list-style-type: none"> <li>Surface water pollution (deterioration of water quality) by leachate from land disposal system?</li> </ul>			
<ul style="list-style-type: none"> <li>Ground water pollution (deterioration of water quality) by leachate from land disposal system?</li> </ul>			
<ul style="list-style-type: none"> <li>Land use conflicts?- land tenure</li> </ul>			
<ul style="list-style-type: none"> <li>Dislocation and involuntary settlement</li> </ul>			

SCREENING QUESTIONS	YES	NO	REMARKS
• Social services?			
• Impairment of cultural/historical site?			
• Degradation of aesthetics and property values?			
• Road blocking and increased traffic during construction of facilities?			
• Social conflict between migrant construction workers and local construction workers?			
• Noise and dust from construction activities?			
• Silt runoff due to construction activities?			
• Inadequate buffer zone between the landfill site and surrounding area to mitigate impact?			
• Hazard to public health due to poor management of landfill site?			
• Emission of potentially toxic organics from land disposal site?			
• Methane gas migration causing pollution of surface and ground water?			
• Loss of deep rooted vegetation from landfill gas?			
• Explosion and fire from landfill gas?			
• Air pollution from incineration?			
• Health and safety hazards to workers from toxic gases and hazardous materials at the site?			
• Health and safety hazards for hazardous wastes (e.g. medical, laboratory etc)?			

## 2. Sewage Treatment

SCREENING QUESTIONS	YES	NO	REMARKS
<b>A. Project Siting</b>			
Is the area:			
• Densely populated?			
• Having heavy development activities?			
• Adjacent to or within environmentally sensitive areas?			

SCREENING QUESTIONS	YES	NO	REMARKS
i. Wetlands			
ii. Lake shores or bay			
iii. River banks			
iv. Protected area			
v. Cultural heritage site			
vi. Buffer zone for protected area			
vii. Special area for biodiversity protection			
<b>B. Potential Environmental Impacts</b>			
Will the project cause--			
<ul style="list-style-type: none"> <li>• Interference with other utilities, nuisance to neighbourhood due to noise, smell, influx of insects, rodents etc?</li> </ul>			
<ul style="list-style-type: none"> <li>• Road blocking during construction?</li> </ul>			
<ul style="list-style-type: none"> <li>• Floods caused by excavation during rains?</li> </ul>			
<ul style="list-style-type: none"> <li>• Traffic disruptions during construction?</li> </ul>			
<ul style="list-style-type: none"> <li>• Silting during construction?</li> </ul>			
<ul style="list-style-type: none"> <li>• Dislocation and involuntary settlement?</li> </ul>			
<ul style="list-style-type: none"> <li>• Social services?</li> </ul>			
<ul style="list-style-type: none"> <li>• Aesthetics problems?</li> </ul>			
<ul style="list-style-type: none"> <li>• Impairment of cultural/historical site?</li> </ul>			
<ul style="list-style-type: none"> <li>• Noise, vibration and dust from civil works?</li> </ul>			
<ul style="list-style-type: none"> <li>• Impairment of downstream water quality due to inadequate sewage treatment or no treatment at all?</li> </ul>			
<ul style="list-style-type: none"> <li>• Sewage overflow or flooding of neighbourhood</li> </ul>			
<ul style="list-style-type: none"> <li>• Environmental pollution from inadequately disposed sludge?</li> </ul>			
<ul style="list-style-type: none"> <li>• Discharge of hazardous materials into sewers causing damage to sewers and danger to workers?</li> </ul>			
<ul style="list-style-type: none"> <li>• Inadequate buffer between the sewage treatment facility and neighbourhood to alleviate nuisance?</li> </ul>			
<ul style="list-style-type: none"> <li>• Social conflict between workers from other</li> </ul>			



SCREENING QUESTIONS	YES	NO	REMARKS
areas and local community workers?			
<ul style="list-style-type: none"> <li>• Public hazards due to overflow flooding, burst systems and pollution of ground water by sewerage system?</li> </ul>			
<ul style="list-style-type: none"> <li>• Water pollution from inadequately disposed sludge or direct discharge of sewage?</li> </ul>			
<ul style="list-style-type: none"> <li>• Health and safety hazards to workers from toxic materials which may be contained in the sewage flow and pathogens in sewage or sludge?</li> </ul>			

## Appendix VII: Preparing Environmental Management Plan

- a) The major output of environmental assessment for proposed project is an EIA report, which includes Environmental Management Plan (EMP). In view of the increasing importance in improving the quality of project implementation and to ensure compliance with required mitigation and monitoring measures identified EIA report will include, as part of EMP, concerned government or related agency undertaking the activities included in environmental management and monitoring plan.
- b) Environmental management involves the implementation of environmental protection and mitigation measures and monitoring of significant environmental impacts. Environmental protection measures are taken to (i) mitigate environmental impacts, (ii) provide in-kind compensation for lost environmental resources, or (iii) enhance environmental resources. These measures are usually set out in an EMP, which covers all phases of the project and outlines mitigation and other measures that will be undertaken to ensure compliance with environmental regulations and reduce or eliminate adverse impacts (see Table A 7.1). The EMP will also cover a proposal for recommending the proposed project to use goods and products that are environmentally friendly.

**Table A7.1: Contents of an EMP**

<b>Contents of EMP</b>	
i)	Summary of potential impacts
ii)	Description of planned mitigation measures
iii)	Description of planned environmental monitoring
iv)	Description of planned public consultation process
v)	Description of responsibilities for the implementation
vi)	Description of responsibilities for reporting and review
vii)	Work Plan: staff chart, schedules, activities and inputs of all including lead agencies
viii)	Procurement Plan that is environmentally responsible
ix)	Detailed cost estimates
x)	Mechanism of feedback and adjustment

- c) Environmental monitoring involves (i) planning a survey and sampling program for systematic collection of data/information relevant to environmental

assessment and project environmental management; (ii) conduct of the survey and sampling program; (iii) analysis of samples and data/information collected, and interpretation of data and information; and (iv) preparation of reports to support environmental management. Environmental monitoring is normally carried out before and during planning to establish baseline data needed for environmental assessment and evaluating environmental impacts during project implementation. It continues through project operation to detect changes in the key environmental quality parameters, which can be attributed to the project. The results of the monitoring program are used to evaluate the following: (i) extent and severity of the environmental impacts against the predicted impacts; (ii) performance of the environmental protection measures or compliance with pertinent rules and regulations; (iii) trends in impacts; and (iv) overall effectiveness of the project EMP.

- d) Environmental monitoring should have clear objectives, and the survey and sampling program designed to focus on data required to meet the objectives. In addition, the design of the monitoring program has to take into account its practicability considering the technical, financial, and management capability of the institutions that will carry out the program and period of monitoring that will be needed to achieve the objectives (see Table A7.2). The monitoring program should include action or emergency plans so that appropriate action can be taken in the event of adverse monitoring results or trends. It should also be constantly reviewed to make sure that it is effective, and determine when it can be stopped.

**Table A7.2: Features of an Effective Environmental Monitoring Plan**

i)	Realistic sampling programme (temporal and spatial)
ii)	Sampling methods relevant to sources
iii)	Collection of quality data
iv)	Comparable new data with other relevant data used in environmental assessment
v)	Cost-effective data collection
vi)	Quality control in measurements and analysis
vii)	Innovative methods (e.g. automated stations tracing pollutants)
viii)	Appropriate databases
ix)	Data interpretation by multidisciplinary team
x)	Internal reporting and external checks
xi)	Allowance for third party inputs
xii)	Avenues for public participation (e.g. public presentations, external assessments)

Both the environmental management and monitoring plans need to include who will implement them, when, and where. The capacity of the executing agency, LG, and community organization should be reviewed to identify feasible approach for implementing the plans. The project lifecycle should be taken into account in setting the timing of implementation. For example, the EMP should identify environmental mitigation measures that should be implemented in the engineering design for the contract documents, and materials to be avoided in procurement, among others. On the other hand, the location for monitoring should be selected based on where the impacts would occur and the areas to be affected. To ensure that the environmental management and monitoring plans will be implemented, it is necessary to identify the key management issues to be included.

## **Appendix VIII: Sample Terms of Reference (ToR) for waste management EIA studies**

### **1. Introduction**

The following guide to develop ToRs for waste management EIAs was adopted with modifications from appendix 4 of the General Guidelines and Procedure for Environmental Impact Assessment 2006.

A Developer applies to Environmental Compliance, Awareness and Cleaner Production of RDB to carry out an EIA for a proposed waste management project in accordance with requirements of EIA Regulations of the Republic of Rwanda. The objective is that the proposed project will incorporate all practical and cost-effective measures for avoiding or minimizing negative environmental impacts, for capturing environmental benefits and for ensuring sound environmental management. Therefore the purpose of the EIA study is to:

- i) provide the Developer with advice on how project design can avoid or mitigate negative impacts and to enhance anticipated environmental benefits, and
- ii) prepare for review by REMA, an EIA report and Environmental Management Plan (EMP) according to national EIA Guidelines and Regulations, 2006.

The Guidelines for EIA for Waste Management should be followed during the EIA process. The following are specific issues to address in the EIA study;

### **2. Project Description**

The EIA Expert should provide a description of proposed project and any alternatives being considered in sufficient detail to benefit stakeholders and decision-makers. Policies, legislation, regulations directly relevant to the proposed waste management project and the environment should be discussed in the EIA report. Relevant documents on waste management and conservation should also be reviewed.

### **3. Environmental Concerns to be addressed in the EIA**

The EIA study should address key ecological (biophysical), socioeconomic and landuse issues. In particular the impacts of wastes on ecosystems, the environment and services should be addressed. Refer to section 3.4 of the EIA Guidelines for waste management where key issues are presented.

While the impact study is to be focused on the above issues, the EIA Experts may, in the course of the impact study, identify further waste management concerns which should be investigated. Any such other issues should be brought to the attention of Environmental Compliance, Awareness and Cleaner Production of RDB and the Developer.

### **4. Environmental Management**

The expert should pay particular attention to identifying and recommending measures or practices for avoiding, mitigating or managing negative impacts of the waste management project on the environment and for enhancing potential environmental and socio-economic benefits. Any potential measures or practices identified by the EIA Expert should be brought to the attention of the Developer for possible inclusion in project design and planning.

In particular, the expert should prepare an Environmental Management Plan (EMP) for *construction, operation and decommissioning* of the waste management project. The EIA Expert should estimate the costs of implementing this plan, including all capital, operating and training costs.

## **5. EIA Project planning and Design**

To maximize opportunity for good environmental planning and design of the project, EIA Experts should work closely with the Developer to offer feasible options to enhance the project's environmental performance.

## **6. Public Consultation**

The Developer is obliged to ensure that all concerned public and private stakeholders in the project have adequate input during the EIA study. The EIA Expert should therefore undertake comprehensive consultation with the local community, relevant lead agencies such as REMA, MINAGRI, MINIRENA, MINALOC, MININFRA, MIGEPROFE in addition to any relevant waste management stakeholders identified when conducting the impact study.

## **7. Content of the EIA Report**

At minimum, the EIA report produced by EIA Experts should contain information outlined in the Appendix X of Guidelines for Environmental Impact Assessment for Waste Management.

## **8. Reporting Requirements**

The expert should submit a final EIA report including Environmental Management Plan (EMP) to the Developer. The Developer after reviewing and appending an EIA Report Addendum to it, if necessary, will submit 10 copies of the final draft report to REMA.

The EIA Expert and developer should be available for discussions about the EIA report with REMA and participate in any public hearings organised by the Authority.

## **9. EIA Team Members**

EIA experts to undertake the EIA study must be recognised and authorised by REMA and Environmental Compliance, Awareness and Cleaner Production of RDB. Professional experts to undertake this study are listed in section 3.13 of Guidelines for Environmental Impact Assessment for Waste Management.

## Appendix IX: Summary of Institutional responsibilities in waste management

<b>Institutions</b>	<b>Responsibilities</b>
REMA	Coordination and supervision of environmental protection activities undertaken by environmental promotion agencies (e.g. waste management and sanitation)
RDB	Through its Environmental Compliance, Awareness and Cleaner Production unit within the Business Operations and Services division: Organise the EIA procedure review EIA reports and take decisions on approval or disapproval of proposed projects.
MINAGRI	Is in charge of the development of agriculture production and animal husbandry. Implementation of Agricultural policy (July 2004) that recognises the need for the protection against land, water and soil degradation of pollution (e.g. of agricultural wastes against pollution and all other agricultural or agro-industry activities that generate wastes).
MINALOC	Is in charge of mobilising the population to participate in the management and protection of the environment (e.g. best practices in waste management).
MINICOM	Is in charge of the promotion of industries, trade and agro-livestock production cooperatives and management of protected tourist areas. To ensure and promote environmental conservation.
MININFRA	In charge of the organisation of human settlement, town planning, public infrastructure and transport; and waste management systems associated with these.
MINECOFIN	In charge of the mobilisation of funds, coordination of donors and allocation of budgets to different Ministries. Coordination of the financing of waste management projects
MINIJUST	In charge of giving support in the resolution of conflicts by formulating appropriate laws
MIGEPROFE	In charge of mobilisation of men and women in the activities of natural resource protection and management.
MINISANTE	In charge of the promotion of hygiene and sanitation among the population
MINEDUC	In charge of training human resources in the management and protection of natural resources
Higher Institutions of learning	In charge of capacity building and research in waste management and environmental management
NGOs/CBOs	In charge of support and working with communities in environment and waste management projects, capacity building and financing community projects
Development partners	Support sector budgets
Local Governments and Town/City Councils	Implement decentralized services (e.g. sanitation and waste management provision)
Private sector	Work under contract to implement environment management projects (e.g. design and construction



	of waste management facilities)
Community	Demand and contribute positively to waste management and sanitation to ensure environmental conservation. Establish recycling, reuse waste businesses

## **Appendix X: Guidelines for Waste Management EIA Report**

Environmental impact assessment report or Environmental Impact Statement (EIS) is the final output of the EIA study for communicating the study findings to the authority (REMA through the Environmental Compliance, Awareness and Cleaner Production, RDB), Lead Agencies, and the public and other stakeholders. The information provided should be clear, succinct and objective. It should include maps, drawings, photos, or other descriptive detail. Only data relevant to the decision-making process should be included. The following sections outline suggested chapters, subsections and contents for EIA reports on proposed waste management projects. These guidelines include all the information required for EIA of the management of solid wastes, wastewater and other liquid wastes.

For a good EIS, it must be technically robust, but at the same time it must be clear, intelligible and unambiguous. The report should be kept short and simple and avoid the use of technical terms unless absolutely necessary. Technical appendices may be included as appropriate.

Below is the proposed contents list for the waste management EIA report:

1. Executive summary.
2. Introduction.
3. Legislative framework.
4. Description of the proposed development.
5. Potential impacts, alternatives and consultation.
6. Description of the existing environmental conditions within and surrounding the site.
7. Prediction and evaluation of significant environmental impacts.
8. Mitigating measures and alternative processes.
9. Residual impacts.
10. Monitoring plan.
11. Conclusions.
12. Bibliography/ list of references.
13. Appendices (include e.g. Technical data, EMP and maps).

### **1. Executive Summary**

The executive summary must be written in non-technical language to facilitate understanding by all readers. It should be concise and must give an overview of:

- a) What the project is?
- b) What the significant environmental impacts will be?
- c) What has been done or is recommended to minimize these impacts?
- d) What significant residual impacts will remain after mitigation?

The content and structure of the summary should broadly follow the heading (sections) structure of the EIA report.

## **2. Introduction**

The introduction should present the background to the project, the purpose of the EIA, responsibility for the EIA, the content of the EIA report, responsible party for preparing the EIA report and the EIA methodology used.

## **3. Legislative Framework**

This section deals with the laws and their administrative regulations considered during the planning of the project, e.g. the Organic law on the environment, Environmental Policy, Decentralization policy, as they relate to waste management and the environment and other sectoral laws, guidelines, regulations and standards, ordinances or by-laws relevant to waste management. It should also deal with issues of licences, permits and certifications required by law for waste management if any. The statutory documents reviewed in this section will differ depending on the nature of the project being assessed and the category of project ( e.g. industry, agriculture, landfill) and the characteristics of the environment (e.g. wetlands, surface water, groundwater, human settlements, land use, etc) anticipated to be impacted.

## **4. Description of the Proposed Project**

This section of the report should be brief, and may refer to a feasibility study carried out by the Developer or their agent. Such a feasibility report should be summarized within the main EIA report, and could be incorporated as a technical appendix. The following should be covered briefly.

### **a) Objectives and Scope of the Proposal**

There should be a clear statement of the objectives of the proposal, including rationale and/or need for the development.

### **b) The Location**

The following information should be provided:

- i. Land Title details and land tenure.
- ii. Land use constraints.
- iii. Maps, plans, ortho-rectified aerial photographs or satellite imagery of appropriate resolution used in site description, clearly identifying the location of the proposed development relative to: Water bodies; Wetlands; other land and water uses; other waste management facilities (e.g. landfill, wastewater treatment works) and potable water treatment works in the vicinity; vegetation communities; infrastructure, roads, utilities.

- iv. Compatibility of the proposal with: Any strategy such as local management plans; Existing land and water uses both on the site and on adjacent land and water; Local land use plans and other community activities in the area; any historical sites or environmental protection areas.

## **5. Description and Layout of the Proposed Development and Associated Facilities**

The following information should be provided:

- a) Maximum area (e.g. land, water, wetland, forest, etc) affected by the proposal.
- b) On-site plans, layout, photomontages or similar, and cross sections identifying the existing and proposed facilities (e.g. landfill drawings, transfer point plans/drawings, incinerator technical drawings, composting facility drawings, recycling plant drawings, wastewater treatment works and any off site associated pipe work or sewage collection systems).
- c) For wastewater treatment projects:
  - i) Characteristics (quality and quantity) of existing and proposed effluent discharges.
  - ii) Design/type of discharge proposed and its location.
  - iii) A description of the predicted inputs to and outputs from the works, e.g. population equivalent to be served, predicted effluent flows, quality and quantity of sludge and screenings produced, method and site(s) for sludge and screenings treatment and/or disposal, incoming/outgoing material and vehicles during operation of the works.
  - iv) A description of the size and type of the project proposed, e.g. method and degree of treatment (sludge drying, digestion etc.), number and the dimension of treatment vessels, storage tanks, pumps, etc.
  - v) Types, quantities and storage arrangements for chemicals used in sewage treatment.
- d) For solid waste management:
  - i) Waste sources, characteristics/category (organic, non-organic, biodegradable, non-biodegradable, hazardous, toxic, carcinogen, etc) and generation rates and population generating the waste.
  - ii) Storage equipment at transfer stations (e.g. skips, bunkers, open concrete yard, etc).
  - iii) Transportation system and transport routes (e.g. trucks, carts, trailers, etc).
  - iv) The environment at the proposed landfill project site (physical, biological,
  - v) Human/social.
  - vi) If incineration - incinerator technical details, inputs, emissions and wastes generated.
  - vii) Any other waste treatment methods applied

e) For all waste management:

- i) Power supply requirements and proposed energy conservation measures
- ii) Details of access arrangements and whether these are completely new, upgraded or already in existence.
- iii) Identification of drainage lines and on site surface water management systems.
- iv) Employment during the project phases.
- v) Arrangements for effluent treatment or storage during maintenance and/or breakdown of plant.

## **6. Site Preparation and Construction Methods**

Describes the works required prior to commencement of operations, including:

- i) Any additional land requirement during construction period.
- ii) Timing, staging and hours of construction work.
- iii) Proposed construction methods including temporary works, the equipment to be used.
- iv) Methods and route of transport of the equipment to the site.
- v) Pollution control systems, e.g. erosion and sediment control systems, wastewater holding tanks, noise and dust mitigation strategies.
- vi) Nuisance (such as floods, storm lights, smell, aesthetic issues) prevention.
- vii) Import or export of material to/from the site, including method and route of transport.
- viii) Any stabilization structures or earthworks including dredging, reclamation, excavation or landfill, quantities of material to be moved out of or onto the site, the method of disposal of excess material, the sources of material to be brought to site.
- ix) Details of the workforce, including source, expected numbers and distribution throughout construction.
- x) Details of potential land contamination which may constrain work on the site or disposal of excess material.

## **7. Other Services in the Locality**

Where applicable, outline:

- i) The capacity and type of any nearby wastewater treatment facility or solid waste management facility; or waste storage facilities or and other type of waste treatment.
- ii) The relationship of the proposed development to previous or existing operations in the proposed project area.
- iii) Past environmental performance of similar nearby projects, including impacts on the environment and the effectiveness of any impact mitigation.

## **8. Potential Impacts, Alternatives and Consultation**

The section summarizes the outcome of the process of identification and prioritization of potential impacts, it should include:

- i) All issues identified.
- ii) The key issues which needed a full analysis in the EIA.
- iii) The issues which needed a full analysis in the EIA, and a reasoned assessment of why they do not need full analysis.

A summary of the general alternatives (e.g. alternative locations, alternative schemes or waste treatment methods, alternative equipment) should be given, with the reasons for the selection of the preferred option. The section should include details of who has been consulted, and the outcome of such consultations.

### **a) Potential Impacts**

Scoping of the EIA should develop from a preliminary investigation of baseline conditions, consultation with regulatory bodies, government lead agencies, stakeholders (the public including the local community) and a preliminary site visit. For both land fill and wastewater treatment works, the construction phase is likely to give rise to negative impacts regarding land take, noise, dust, traffic, and movement into and off the site of materials.

During operation of any wastewater treatment works positive impacts may occur on the quality of a watercourse to which a works already discharges, and on health and living standards of local residents. Negative impacts on water quality of receiving water may also occur, if it is not currently used for effluent disposal. Negative impacts are likely regarding loss of useful land to the project, odours, noise, traffic and landscape. Disposal of sewage sludge generated may be either a positive impact (if of suitable quality, adequately treated and used in agriculture), or a negative impact (if of unsuitable quality for use in agriculture, insufficiently treated, or disposed to landfill or other waste disposal site). Other impacts, both positive and negative, will occur, but will depend on the particular site, proposal and circumstances. Solid wastes that can be recycled or reused can be a source of income to the community and entrepreneurs with a positive impact. Organic vegetable matter can be composted and compost sold, plastics and metals can be recycled or reused.

Landfill site pose negative impacts in the form of land losses, odour, noise, traffic, landscape, insects, rodents, scavengers, birds and aesthetics. Leachates may also pollute land and water courses if not contained and treated. Positive impacts associated with landfill is the reduction of waste nuisance in urban area, provision of employment opportunities to waste workers, livelihood opportunities to waste pickers and improvement in public health and living standards. Other opportunities in the solid waste

sector are composting, recycling and reuse of wastes which can provide business opportunities to the community and entrepreneurs.

The procedures or methodology used to identify and priorities issues should be outlined. This should include:

- i) Relevant guidelines issued by government authorities, provisions of any relevant environmental protection legislation, and relevant strategic plans or policies.
- ii) Relevant research or reference material, effluent / waste water treatment studies, solid waste management studies (e.g. landfill type, incinerator type, recycling, storage, composting options) and relevant preliminary studies or pre-feasibility studies.

#### **b) Alternatives**

The EIA should include an assessment of the environmental impacts or consequences of adopting alternatives, including:

- i) Alternative location(s).
- ii) Alternative schemes and layouts of the development and services (these may be further developed under mitigation section).
- iii) Alternative management or operational practices (these may be further developed under mitigation section).

The scoping exercise can explicitly report on what grounds the preferred alternative was chosen. The main part of the EIA can then concentrate on the preferred option.

#### **c) Consultation**

The EIA report should include details of consultation undertaken as part of the EIA process. Those consulted should include relevant stakeholders. A brief description of the reason for and the outcome of consultation should be included. For wastes regulatory powers or responsibilities concerning planning control, waste disposal, and discharge limits to fresh waters, emissions to air and application of sludge to land must be consulted. Other agencies or departments might include those responsible for conservation of natural resources (water, wetlands, forests, National Parks, etc), as appropriate.

### **9. Description of the Existing Environmental Conditions within and surrounding the project site**

An overview of the existing environment should be provided in order to place the proposal in its local and regional context, and to provide baseline data which may be used for subsequent monitoring. General information to be provided for specific issues

identified as potentially important in the assessment of impacts from waste management proposals is discussed in the following subsections, and includes:

- i) Other projects in the area including waste management projects.
- ii) Water quality and aquatic ecology.
- iii) Socio-economic and cultural environment.
- iv) Transport system and access.
- v) Air quality.
- vi) Flora and fauna.
- vii) Hydrology and groundwater.
- viii) Visual environment and landscape - Aesthetics.
- ix) Proposed project site in relation to other landuse(s) in the area
- x) Risk and hazards.
- xi) Meteorological data.
- xii) Landscape and topography.

Data must be specific to the proposed site, rather than general information on a particular area, and the EIA should only deal with issues relevant to the proposal being assessed. Each issue and the level of detail should match the level of importance of the issue in decision-making. *To make the EIA report easier to read, it may be sensible to include the specialist detail for each of the following sections as a technical appendix to the report, with a summary of each section in the main EIA report.*

## **10. Water Quality and aquatic ecology**

Discussion should focus on those water quality characteristics that may be impacted, and on the assimilation capacity of the water body to which the proposed project will discharge. Both positive and negative changes in water quality will need to be quantified (e.g. pollution, eutrophication, siltation, etc), and therefore baseline data will be required. The existing microbiological, chemical, biological and hydrologic conditions in the water body to which the proposed waste facility will discharge should the development be approved, must be assessed. For landfills, estimates of loads from leachate should be done and for wastewater plant effluent loads determined. The following water quality indicators and hydraulic conditions must be assessed for both the existing and proposed effluents, and for both water courses to which the proposed project will discharge, and for any ecological systems affected by the discharges:

- i) Faecal coliforms (as indicators of faecal contamination).
- ii) Levels of dissolved oxygen and Biochemical Oxygen Demand (BOD),
- iii) Particulate matter (increased turbidity and reduced light penetration, siltation).
- iv) Chemical contaminants from likely industrial or agricultural sources such as metals, toxins, biocides (insecticides, herbicides, etc), PCBs and hydrocarbons; pathogenic organisms.
- v) Heavy metals
- vi) Hazardous wastes (e.g. medical and research wastes)
- vii) Aquatic biological indicators (micro-organisms and macro-invertebrates);
- viii) Nutrients (nitrogen and phosphorus).



The status of the water resources nationally and internationally (e.g. transboundary) must be discussed.

## **11. Social, Economic and Cultural Issues**

Baseline data collection should cover the following:

- i) Existing health of the local population (in quantitative terms where possible) which may be affected by provision or change to waste treatment or collection (e.g. local incidence of water borne diseases).
- ii) Existing potable water usage of the community, which may be affected after provision of waste collection and treatment system.
- iii) Existing charging structure and cost of waste management.
- iv) Wastewater disposal and solid waste disposal, which may be affected by provision of different waste collection and treatment systems.
- v) Impacts of existing waste disposal systems which may be affected by provision of different systems.
- vi) Existing and projected water treatment facilities for potable supply, which may be affected by provision of different waste management systems.
- vii) Local employment conditions which may be affected during construction and operation.
- viii) Existing economic situation which may be affected by provision of different waste treatment, especially concerning: other developments, land values, agriculture, tourist facilities.
- ix) Identification of items or sites of cultural or historical significance likely to be affected by the proposal, and an assessment of their cultural and/or financial importance.

## **12. Waste Management**

Data on existing and proposed waste management systems should include:

- i) Likely opportunities for re-use of sewage sludge and solid wastes and/or effluent (e.g. availability of agricultural land, attitudes towards use of sewage sludge and wastes in agriculture, ease of distribution of sludge to end users, legislative requirements for such re-use, manure and briquette production from solid wastes, solid waste reuse and recycling, wastewater use in agriculture).
- ii) Potential sites and routes for disposal of wastes.
- iii) Potential disposal sites and routes for excess material from the site during construction of the management site.

## **13. Solid waste recycling and reuse**

Alternative ways of solid waste management that reduce pressure on the conventional methods (landfill, incineration) are often overlooked in EIA. EIA of solid waste management should include data and environmental management systems (EMS) with explicit waste management activities such as:

- i) Waste segregation or sorting.
- ii) Waste recycling options.
- iii) Wastes reuse options.
- iv) Composting.
- v) Potential contribution from waste pickers (scavenging) towards waste reduction.
- vi) Itinerant waste buyers.
- vii) Wholesalers.
- viii) Recycling enterprises.
- ix) End-users.

Here the community can be encouraged to get involved in waste management through awareness programmes, capacity building and financial facilitation to form micro-or small waste businesses. There is already an NGO making manure and briquettes in Kigali and this should be supported and duplicated in other areas as informal measure to reduce the pressure of waste management.

Waste management EIAs should discuss the options below:

- i) Waste stream segregation;
- ii) Recovery;
- iii) Reuse; and
- iv) Recycling.

#### **14. Air Quality**

Air quality is likely to be significantly affected by any solid waste or wastewater treatment works proposal, both during construction and operation. Likely major issues include dust, volatile organic compounds (VOCs), odours, aerosols. Noise generated during any phase of the project is also likely to have a significant impact if the proposed site is near community settlements. Assessment of baseline conditions should include:

- i. Identification of sources of existing odours and VOCs.
- ii. Identification of sources of existing dust generation.
- iii. Identification of sources of existing noise.
- iv. Meteorological conditions which will affect distribution and severity of air quality impacts, in particular: strength and direction of prevailing wind; and rainfall frequency, duration and quantity.
- v. Collection of topographical information which will affect distribution of air quality (e.g. steep slopes, hills, presence of tall vegetation).

- vi. Identification of sensitive receptors (e.g. schools, residences, leisure parks and hospitals which may be affected by odours, dust and noise; important crops or natural areas which may be affected by dust and/or noise respectively) within the area likely to be affected by improved or deteriorating air quality.

## **15. Flora and Fauna**

Terrestrial and/or aquatic flora and fauna or their habitats which are likely to be disturbed or obliterated by the project must be identified and their importance evaluated. As a general rule, distribution data should be presented as habitat or species location maps, shown in relation to position of the proposed works. Data collection and surveys should include:

- a) Identification, description and distribution of areas of terrestrial and aquatic (including wetlands) habitats that may be directly or indirectly affected especially those:
  - i) Supporting threatened or protected species or habitats.
  - ii) Of commercial importance (e.g. for agriculture, aquaculture or fisheries).
  - iii) Of nature conservation or scenic importance.
  
- b) Assessment of the importance of the habitats or species identified above, in terms of International, National, Regional or Local importance.

## **16. Transport and Access**

Information to allow assessment of potential transport and access impacts should include:

- i. Assessing condition and size of roads on route(s) to be used by the project.
- ii. Assessing existing traffic levels on these routes, at different times of day and times of the year.
- iii. Assessing suitability of access to the site for vehicle sizes and types likely to be used during the project.
- iv. Assessing the suitability of the vehicle transport type to convey wastes without causing nuisance on the way
- v. Investigation for the presence of particularly sensitive developments on routes likely to be affected, e.g. schools, residences, hospitals, leisure parks, shopping centres on the routes.

A detailed traffic study may be required where vehicle movements are likely to significantly affect the community.

## **17. Hydrology and Groundwater**

Hydrological issues to consider which may either be affected by the development, or affect the development itself include:

- i. Existing drainage patterns with the aid of spatial information, including the location of wells and boreholes and identification of areas prone to floods, the range of water heights/depths in the area;
- ii. Groundwater regime and quality, e.g. depth to groundwater level, whether groundwater is used for water supply and its quality, whether control of the use of groundwater is done in the proposed project area;
- iii. Presence and importance of structures likely to be affected by changes in groundwater levels.

## **18. Visual Environment and Landscape**

The nature of the existing visual environment and landscape should be assessed for their sensitivity to impacts such as changed, obstructed views and unsightly activities. Particularly sensitive receptors likely to be affected in the vicinity should be identified, such as tourist establishments, prestigious developments, schools, recreation facilities, etc.

## **19. Risk and Hazards**

Risks and hazards posed by the proposed project should be identified and if possible quantified. Information should include:

- i) Storage and handling of hazardous materials;
- ii) Traffic hazards including vehicle accidents, spillage of hazardous materials, etc
- iii) Likelihood of release of chemicals, health risk substances, effects of floods, storms, landslides, fire, explosion.

## **20. Prediction and Evaluation of significant Environmental Impacts**

EIA report should include a discussion of impacts during each of the phases of the proposed waste management project. Impacts of different aspects of the proposed project on the above sectors of the environment should be considered separately. Criteria for evaluation of the significance of impacts should distinguish between impacts which are:

- i) Positive and negative.
- ii) Reversible and irreversible.
- iii) Short term and long term.
- iv) Direct, indirect or cumulative.

Criteria should be based on local legislative standards wherever possible. Where these are not available, acceptable international standards should be used (e.g. WHO, US EPA guidelines, etc.). In all cases the choice of the appropriate standard must be robust and defensible. If no suitable standard is available, then the criteria developed and used must be clearly explained in the EIA. Use of matrices can be very helpful in co-coordinating

and summarizing information for this section of the EIA report. Examples of potentially significant impacts of waste management developments include (but are not restricted to):

- i) Positive impacts on water quality, health of local population, aquatic flora and fauna currently affected by untreated or inadequately treated wastes.
- ii) Negative impacts on flora and fauna or local inhabitants by occupation of site or direct removal of habitats of nature conservation, agricultural or aquaculture importance.
- iii) Positive impacts by provision of sewage sludge for use in agriculture, or this impact could be negative if the sludge is not adequately treated.
- iv) Positive effect on community livelihood by providing business opportunities (e.g. composting, recycling, waste picking and sales, etc).
- v) Negative indirect effects, e.g. dust generated during construction affecting crop growth, damage to crops by spillages or leakage onto adjacent land or into irrigation waters.
- vi) Positive effects on local economy allowing rapid development, by provision of waste treatment.
- vii) Negative impacts on the community (infections, injury, smell, vermin, contamination, etc).
- viii) Negative impact caused by pollution of water (e.g. eutrophication, fish kills, disease organisms, poisoning, etc).
- ix) Negative impacts of pollution of land and groundwater causing loss of use of these resources.
- x) Negative odour and aesthetic problems.

## **21. Mitigation Measures and Alternative Process**

This section considers mitigation measures and strategies to reduce negative impacts on different sectors of the environment. Mitigation must be sustainable, integrated and feasible. Some mitigation measures should be implemented at a very early stage of design of the works easily, but are difficult or expensive to implement once early design has been completed. Therefore it is vital that any mitigation should be discussed and developed in consultation with the developer and regulatory authorities throughout the EIA process. This section of the EIA report should therefore be a summary of any mitigation already implemented in the ongoing design of the facility, and also include any recommended mitigation strategy to be implemented during the other project phases.

This section may also include any enhancement measures for which there is a commitment from the developer, which will enhance any positive impacts of the development. This may include measures such as planned public education programmes in waste management, re-use and recycling, composting, entrepreneurship, etc. Suitable mitigation for waste treatment facilities will depend on the design and layout of the facility, as well as the local environment, and location.

## **22. Residual Impacts**

This section should give a summary of those impacts which will remain assuming mitigation has been implemented. It will therefore include those impacts for which there are no suitable or only low levels of mitigation, and positive impacts.

### **23. Monitoring Plan**

The EIA should outline the need for, and use of any proposed monitoring plan, its duration and reporting procedures, define suitable criteria for monitoring, and actions to be taken in the event of non-compliance with these criteria.

Parameters which may be relevant in monitoring include:

*a) Performance indicators in relation to critical operational issues including:*

- i) Waste generation sources.
- ii) Categories of waste generated.
- iii) Water quality (surface and ground water).
- iv) Sludge and screenings (quality and quantity).
- v) Solid waste categories generated and generation rates.
- vi) Quantities solid waste collected and deposited at land fill.
- vii) Solid waste re-used, recycled (quantity).
- viii) Solid waste composted (success of composting in communities).
- ix) Wastewater effluent quality versus discharge standards.
- x) Discharge quality of leachate treatment plant versus discharge standards.
- xi) Environmental sanitation and cleanliness of premises, private, public.
- xii) Noise and air quality.
- xiii) Public health indicators.
- xiv) Terrestrial and aquatic flora and fauna.

*b) Monitoring.*

This section presents a monitoring plan. This is to ensure commitments in the EIA, subsequent assessment reports, and approval or licence conditions. This should demonstrate that sound environmental practices that will be followed during the construction and operation of the development project. It should cover the following:

- i) Management of construction impacts, (e.g. dust, disposal of waste material, re-vegetation management plans).
- ii) Management of operational impacts, (e.g. effluent and sludge quality and quantity management, odours, noise, dust, plant maintenance plans, leachate quality and quantity, hazardous materials and fuel management, transport management, site management and security plans, emergency and contingency plans).

- iii) Strategies and action plans to feed information from the monitoring program into the management practices.
- iv) Public awareness and training programmes for operational staff.
- v) Indicators of compliance with licensing and approval of national regulatory requirements.

The Environmental Management Plan should describe the following monitoring details:

- i) The key information that will be monitored, its criteria and the reasons for monitoring (e.g. limits of parameters such as BOD, faecal coliform bacteria, suspended solids, ammonia and nutrients, drug residues, to be achieved in the effluent and also heavy metals from solid waste leachates).
- ii) The monitoring locations, intervals and duration of monitoring.
- iii) Actions to be undertaken if the monitoring indicates a non-compliance with the defined criteria or an abnormality.
- iv) Internal reporting procedures and links to management practices and action plans.
- v) Reporting procedures to relevant authorities and, if appropriate, to the consent authority (REMA) or the community.

Guidelines for waste management (Appendix IV) are also important as reference during EIA.

## **24. Conclusions**

This should be a summary of the prediction of the impacts and evaluation of the impacts, the mitigation measures assigned to the impacts and the alternatives and also the identified residual impacts to emphasize:

- i) Which impacts are likely to be significant?
- ii) How significant they will be/
- iii) Which parts of the environment are likely to be affected?
- iv) Whether mitigation is possible.
- v) The likely success of mitigation measures adopted or recommended to alleviate those impacts.

This information can be presented either as text, or as summary tables, if desired.

The developer shall submit the EIS to the Environmental Compliance, Awareness and Cleaner Production unit of RDB that will in-turn forward copies to REMA, the Lead Agency and to the stakeholders and interested parties for comment and review, before approval is considered. Any comments received shall be taken into account in making a decision on the EIS.