

**AN ASSESSMENT OF ENVIRONMENTAL IMPACT ASSESSMENT (EIA)
PROCEDURES AND CHALLENGES FACED BY ENVIRONMENTAL
OFFICERS IN EIA IMPLEMENTATION IN RWANDA**

By

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DECLARATION

The research herein was undertaken in the School of Environmental Sciences, University of KwaZulu-Natal under the supervision of Professor Urmilla Bob.

The study reflects the original endeavour of the candidate. Where the resources of others have been used, they have been duly acknowledged in the text. This dissertation has not been submitted in any form for a degree to any other University.

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Prof. Urmilla Bob

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Date

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DEDICATION

- To the Almighty God for your infinite love, your help when I was helpless.
- To my beloved parents, brothers and sisters who were killed during the 1994 Tutsi Genocide for your affection, sacrifice, education and love you gave me to make my life better and worthy.

ABSTRACT

Environmental Impact Assessment (EIA) is one of the most used tools for environmental management since its introduction in 1970s in the United States of America. Being a systematic process that examines the environmental consequences of development actions in advance, it is perceived as one of the tools which can help different nations to achieve sustainable development because of its capabilities to provide necessary information for decision-makers in order to balance economical, social and ecological paradigms of sustainable development in development projects. This research aims to assess the practice of the EIA processes in Rwanda and specifically seeks to identify the major challenges faced by environmental officers in this process. Given the nature of this research, policy review and desktop research methods have been used to study the current EIA procedures in Rwanda while a quantitative survey method was used to collect data and assess the practices of EIA process as well as the challenges faced by environmental officers in Rwanda. All environmental officers (8) who were dealing with EIA in Rwanda before the transfer of the EIA department to the Rwanda Development Board (RDB) and all consultant companies which have been approved and which have at least done an EIA study in Rwanda (19) were targeted and received questionnaires via emails. All the environmental officers and 12 (63%) of the consultants responded to the questionnaire. The data was captured in the Software Package for Social Sciences (SPSS) template after being coded and has been analysed thematically. The policy review reveals that the current procedures are being developed given that the EIA process started in 2005. Like many developing countries, implementation remains a key challenge. Institutional arrangements remain to be finalised. In terms of the survey findings, even if EIA officers are more experienced than EIA consultants both have some skill gaps including using Geographical Information System (GIS) and remote sensing, understanding project management and customer care skills. Additionally, they receive very little training and capacity-building opportunities, although they desire these. The main challenges identified related to insufficient baseline data, funding, shortage of staff, lack of adequate resources, instilling environmental awareness among developers (developers perceive EIA as a barrier) and Strategic Environmental Assessment (SEA) which is not conducted.

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LIST OF ACRONYMS

ADB	Asian Development Bank
BSc	Bachelor of Science
CAPI	Computer Assisted Personnel Interview
CATI	Computer Assisted Telephone Interview
CBA	Cost Benefit Analysis
CBOs	Community Based Organisations
CEA	Cumulative Effects Assessment
CEAA	Canadian Environmental Assessment Agency
DEIACE	Department of Environment Impact Assessment, Compliance and Enforcement
DETR	Department of Environment, Transport and Regions
DNR	Department of Natural Resources
DoE	Department of Environment
EA	Environmental Audit
EAc	Environmental Accounting
ECA	Economic commission for Africa
EF	Ecological Footprints
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EM	Environmental Monitoring
EMP	Environmental Management Plan
EMS	Environmental Management System
En	Energy Analysis
EP	Environmental policy
EPI	Environment Performance Index
EU	European Union
GDP	Gross Domestic Product
GIS	Geographical Information System
GoR	Government of Rwanda

IA	Impact Assessment
IAIA	International Association for Impact Assessment
ICT	Information and communication Technology
IEA	Institute of Environmental Assessment
INEAC	Institut National pour l'Etude Agronomique au Congo
IOA	Input-Output Analysis
ISAR	Institut des Sciences Agronomiques du Rwanda
LCA	Life Cycle Assessment
LCC	Life Cycle Costing
MDGs	Millennium Development Goals
MEC	Member of Executive Council
MFA	Material Flow Accounting
MINELA	Ministry of Environment and Land
MINETO	Ministry of Environment and Tourism
MINIRENA	Ministry of Natural resources, Environment and Mines
MoEF	Ministry of Environment and Forest
MSc	Masters of sciences
NGOs	Non Government Organisation
NEMA	National Environmental Management Agency
NEPA	National Environmental Policy Act
PgD	Postgraduate diploma
PhD	Philosophiae Doctor (Doctor of Philosophy)
RA	Risk Assessment
RDB	Rwanda Development Board
REMA	Rwanda Environment Management Authority
SA	Sustainability Analysis
SAIEA	Southern African Institute for Environmental Assessment
ScA	Scenario Analysis
SEA	Strategic Environmental Assessment
SEEA	Systems of Economic and Environmental Accounting
SEPA	State Environmental Protection Agency

SoE	State of Environment
SPSS	Software Package for the Social Sciences
SWOT	Strength, Weakness, Opportunity and Threat
ToR	Terms of Reference
UK	United Kingdom
UNEP	United Nations Environment Programme
USA	United State of America
USAID	United States Agency for International Development
WB	World Bank

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CHAPTER ONE: GENERAL INTRODUCTION

1.1 Introduction

This chapter is an overall introductory chapter for the study. It consists of the introduction and motivation for the study. It encompasses the fundamental aspects of the study, namely, the aim, objectives and methods employed for the execution of the study. This introductory chapter further provides an outline of the sequence of all the chapters that make up the study.

According to Wood (2003a), Environmental Impact Assessment (EIA) is defined as a means of evaluating the likely consequences of a proposed action which will significantly affect the environment, before that action is taken. Furthermore, Glasson *et al.* (1999) illustrate that EIA is a systematic process that examines the environmental consequences of development actions, in advance. In a similar manner, Rwanda Environment Management Authority (REMA, 2006) also 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, cultural and socio-economic characteristics of a particular geographic area in order to provide information necessary for enhancing decision-making. Given these definitions, it can be deduced that EIAs assist in determining whether a proposed project is environmentally viable as well as the level of its impact and their mitigation measures in order to facilitate decision-making on its authorisation and certification. Noble (2006) reveals also that the primary purpose of EIA is to facilitate the consideration of the environment in planning and decision-making in order to make it possible to arrive at decisions and subsequent actions that are more environmentally sustainable. However, EIA should not be seen merely as a mechanism for preventing development that might generate potentially negative environmental impacts (Noble, 2006). In addition, Thomas and Elliot (2005) assert that a typical EIA process is aimed at the identification of possible risks to the environment that may result from a proposed action so this information is then used to decide whether to proceed with

the action and under what conditions. Historically, EIA and its establishment in different countries have been in operation since the enactment of National Environmental Policy Act (NEPA) in United State of America (USA). Thereafter, EIA systems have been established in various forms throughout the world, beginning with more developed countries, for example, EIAs commenced in Canada in 1973, Australia in 1974, West Germany in 1975, France in 1976 and later also in less developed countries (Glasson *et al*, 1999). The same authors state further that these EIA systems vary greatly, some are in the form of mandatory regulations, Acts, or statutes; and are generally enforced by the authorities by requiring preparation of an adequate Environmental Impact Statement (EIS) before permission is given to proceed.

The Government of Rwanda (GoR, 2007) reveals that environmental challenges in Rwanda date back several decades but the main threat to the environment is the rapid increase in population which is placing increased pressure on the physical environment. Furthermore, the poor depend directly on resources and natural services for their livelihoods so in Rwanda, like other developing countries, there is a massive exploitation of natural resources which has a direct impact on the quality of the environment (GoR, 2003a). Today, to effectively manage environmental challenges such as soil erosion, deforestation, wetland drainage, water degradation, climate change and the loss of biodiversity; the GoR established the 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 (REMA, 2006). In the general guidelines and procedures for Environmental Impact Assessment of Rwanda, it is stipulated that one of REMA's principal functions is to oversee the conduct of EIAs and take a decision on proposed development projects to be undertaken by both public and private sectors (REMA, 2006). Recently, the Rwanda Development Board (RDB) was established by Organic Law No.53/2008, published on 02/09/2008 as a specialised organ in charge of fast tracking development activities and to facilitate government and private sector in delivering services on development, promoting local and foreign direct investments in Rwanda, and facilitating and helping investors meet environmental standards in the execution of their projects. In line with the establishment of RDB, one of REMA's units,

namely, the Department of Environment Impact Assessment, Compliance and Enforcement (DEIACE) was detached to merge with all government agencies responsible for the entire investor experience under one roof into the RDB. This includes key agencies responsible for business registration, investment promotion, environmental clearances, privatisation and specialist agencies which support the priority sectors of ICT and tourism as well as human capacity development in the private sector. Therefore, an agreement of working arrangement which is aimed to facilitate collaboration between the parties with regard to the efficient and effective implementation of transferred responsibilities from REMA to RDB has been signed.

The EIA processes in Rwanda have the same hindrances as other developing countries. Many developers see it as another costly and time-consuming constraint on development but EIA can be of great benefit to them, since it can provide a framework for considering location and design issues and environmental issues in parallel (Glasson *et al.*, 1999; Morgan, 2002). Furthermore, the benefits of EIA are various and some of them are discussed in chapter two.

1.2 Motivation for the study

This research study focuses on the EIA processes in Rwanda and specifically on the challenges faced by environmental officers. According to Morris and Therivel (2001), EIAs involve individual assessments of aspects of the environment (population, landscape, heritage, air, climate, soil, water, fauna, flora) likely to be significantly affected by a proposed project.

The major problem in the field of environmental protection in Rwanda is the imbalance between the population and the natural resources (land, water, flora and fauna and non-renewable resources) which have been degrading for decades. This degradation is observed through massive deforestation, the depletion of biodiversity, erosion and landslides, pollution of water ways and the degradation of fragile ecosystems, such as swamps and wetlands (GoR, 2000). Rwanda's first comprehensive state of the

environment report which provides a baseline environmental data and indicators also shows that the aftermaths of the 1994 Tutsi Genocide played a key role in environmental degradation in the country (REMA, 2009). Organic Law Number 04/2005 of 08/04/2005 determining the modalities of protection, conservation and promotion of environment in Rwanda, in its article 67 stipulates that every project must be subjected to an EIA, before authorisation for implementation can be granted. This also applies to programmes and policies that may affect the environment (GoR, 2005).

Different authors have asserted that EIA processes have their strengths and weaknesses but they differ from one country to another and challenges are observed by EIA practitioners (both officers and consultants). Sandham *et al.* (2005) in their research on aspects of environmental impact assessment practices in Limpopo province (South Africa) revealed that the most critical is the understaffing in the EIA office in Limpopo province and the consequent inability to conduct sufficiently strict and thorough reviews. Moreover, the shortages in EIA personnel could in turn be due to the lack of properly trained EIA practitioners in Limpopo province. According to Opoku (2001), the key problems with aspects of the EIA process in Ghana are lack of organised baseline data and local EIA experts. In Ghana, assessment and prediction of the magnitude were based on generalisations with little or no relation to the reality or project environment and lack of public input is also one of the constraints of EIA processes (Opoku, 2001). Mokhehle and Diab (2001) stressed that one of the major hindrances to the use of EIAs as an effective environmental management tool is the lack of political priority accorded to the environment. The main challenge was the high turnover of staff within the department with the consequence that a high proportion of current staff is newer, younger and less experienced in EIA processes (Morrison-Saunders and Bailey, 2009).

Given the challenges of the EIA process, this study focuses on assessing the EIA process in Rwanda and challenges faced by environmental officers in order to provide recommendations on best practices of EIA to achieve sustainable development. Rwanda as a developing country needs to have a strong EIA system in order to respond to the massive degradation of the environment due to rapid development.

1.3 Aim

The primary aim of this study is to assess the EIA process in Rwanda and identify the major challenges faced by environmental officers in implementing EIA processes.

1.4 Objectives

To meet the aim of this study, this research has a number of objectives that are outlined below.

- To critically assess current EIA procedures and its practice in Rwanda.
- To examine the profile and skills levels of environmental officers in Rwanda.
- To ascertain current experiences among environmental officers in Rwanda.
- To identify the challenges faced by environmental officers in implementing EIA processes in Rwanda.
- To forward recommendations based on the research findings to improve EIA processes and address challenges faced by environmental officers.

The key research questions that were asked in this study are:

- What are the hindrances of implementation of EIA processes in Rwanda?
- How are people involved in each step of the EIA processes in Rwanda?
- Who are the main stakeholders and their responsibilities in relation to the EIA processes in Rwanda?
- What are the qualifications and experiences of environmental officers in Rwanda?
- What are the skill gaps of environmental officers linked to the EIA processes in Rwanda?
- What are the main challenges environmental officers face in the implementation of the EIA processes in Rwanda?

1.5 Brief summary of methodological approach

Policy review and desktop research methods were used to study the current EIA procedures in Rwanda while quantitative research methods were used to collect data and assess the practices of EIA processes as well as the challenges faced by environmental officers in Rwanda. Quantitative data was mainly obtained through a questionnaire

survey and the primary data was supplemented with the secondary data relating to the focus of this study.

The data collected from the questionnaires was captured into the Software Package for the Social Sciences (SPSS) after being coded. The SPSS system facilitated the researcher to generate graphs and tables that helped the researcher to analyse the data thematically in relation to the key questions mentioned above.

1.6 Chapter sequence

The second Chapter encompasses a literature review of the main issues that relate to the topic of this study. Chapter three summarises the background of the study area and presents the research methodologies. The description of data and discussion of the results obtained from the application of methods described in chapter three are covered in chapter four. The final chapter of this report presents the summary of the key findings based on the objectives of this study, the recommendations and general conclusions are also submitted in the final chapter.

1.7 Conclusion

This chapter has introduced and motivated the purpose of this research. The main aim, objectives and research questions of the study have been sufficiently presented. Furthermore, the fundamental aspects of this study have been discussed in this chapter. In conclusion, this study assumes that EIA officers have different challenges in implementing EIA processes in Rwanda. Thus, this study also hopes to contribute possible solutions that can be adopted to resolve some of the issues identified.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Tools of environmental management are different methods, procedures, mechanisms and means which are used to conserve, promote and protect the environment and some of them are used to predict and prevent negative impacts on the environment. There are many different environmental tools. Finnveden and Moberg (2005) point out a number of common tools of environmental management which include the following: Environmental Management System (EMS), Environmental Management Plan (EMP), Environmental Impact Assessment (EIA), Strategic Environmental Assessment (SEA), Material Flow Accounting (MFA), Systems of Economic and Environmental Accounting (SEEA), Environmental Audit (EA), Life Cycle Assessment (LCA), Life Cycle Costing (LCC), Input-Output Analysis (IOA), Cost benefit Analysis (CBA), Energy Analysis (En), Ecological Footprints (EF), Risk Assessment (RA), Environmental Accounting (EA), Cumulative Effects Assessment (CEA), State of Environment (SoE), Environmental Policy (EP), Scenario Analysis (ScA), Sustainability Analysis (SA) and Environmental Monitoring (EM). Noble (2006) reveals that according to World Bank, Environmental Impact Assessment (EIA) is the most widely practiced environmental management tool in the world.

This chapter will explain in detail the definition of EIA, the background of EIA, and the objectives and the steps of EIA procedures. It will illustrate also the state and challenges of EIA in developed and developing countries, especially in Africa. However, emphasis will be placed more on EIA procedures in Rwanda. Environmental protection is the cornerstone for achieving sustainable development so different tools of environmental management should be applied in order to balance economic, social and environmental issues. In this regard, therefore, this chapter will also discuss how Environmental Impact Assessment can help to achieve sustainable development. Lastly, Strategic Environmental Assessment (SEA) as a tool which has been introduced to supplement EIA to address economic, environmental and social issues sustainably will be discussed.

2.2 Environmental Impact Assessment

2.2.1 Definition of EIA

According to Noble (2006), there is no single universally accepted definition of EIA and it is often defined as a tool, a methodology and a regulatory requirement but most importantly it is a process. Aucamp (2009) defines EIA as a process of examining the potential effects on the environment of a proposed development. Therefore, EIA has been defined by many different authors but many definitions embody the assessment of impacts at a conceptual planning stage to be able to influence decisions in a timely manner (Economic Commission for Africa - ECA, 2005). The International Association for Impact Assessment (IAIA) and UK Institute of Environmental Assessment (IEA) define EIA as a process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made (Noble, 2006). In the similar manner, Modak and Biswas (1999) assert that EIA is a multi-faceted decision-making process which is structured to anticipate, analyse, and disclose the consequences associated with proposed activities with respect to established public policies for protecting and enhancing the natural and anthropogenic environment.

2.2.2 Historical background of EIA

United Nations Environment Programme (UNEP, 2004) and Benson (2003) reveal that EIA has been in existence since 1970 when it was introduced into the United States of America and has spread rapidly since then to all parts of the world. Benson (2003) reveals also that since the enactment of National Environmental Policy Act (NEPA), many state EIA systems were established in the United States of America (USA). Furthermore, the same author asserts that the approval of a European directive on EIA in 1985 stimulated the enactment of EIA legislation in many European countries in the late 1980s. In a similar vein, Morgan (2002) asserts that the formation of new countries after the break-up of the Soviet Union in 1991 led to the enactment of EIA legislation in many of these countries in the early to mid-1990s.

The 1990s also saw a large growth in the number of EIA regulations and guidelines established in Africa and South America which resulted in more than 100 countries adopting EIA systems by 1996 (Mokhehle and Diab, 2001; Benson, 2003). Therefore, EIA spread faster in the most of the countries because it was required by funding bodies like the World Bank, United States Agency for International Development (USAID) and others as a part of a funding approval process. Consequently, some international development and funding agencies have set up EIA guidelines, including the European Bank for reconstruction and development in 1992, Overseas Development Administration in 1996, and the UNEP in 1992 and 1995 (Glasson *et al.*, 2005). The scope of EIA has been increasing with time and it has also been shown by Glasson *et al.* (2005) that the social dimension of the environment has been another matter of concern in the EIA processes, after a long campaigning by black and ethnic groups, particularly about inequalities in the distribution of hazardous waste landfills and incinerators in the USA.

Mokhehle and Diab (2001) assert that the diffusion of EIA into developing countries has been slow by contrast and the growth has occurred largely since the late 1980s and particularly as a result of the Rio Earth Summit in 1992. In Africa, by 1997 more than 40% of the countries had mandatory EIA procedures for development activities (Mokhehle and Diab, 2001). Similarly, the Southern African Institute for Environmental Assessment (SAIEA) reveals that by 1996, more than 100 countries worldwide had EIA systems but these varied greatly in terms of procedures and practices because some were in the form of regulations, others had EIA guidelines, and yet others had systems that were more *ad hoc* (Weaver, 2003; Benson, 2003). However, EIA is still relatively new in some countries, but virtually all countries have it as a legal or administrative requirement (UNEP, 2004).

2.2.3 Objectives of EIA

Environmental impact assessment is a process with several important purposes and objectives. Most of the different authors emphasise two crucial issues, notably enhancing decision-making and ensuring sustainable development.

Aucamp (2009) asserts that the overall aim of EIA is to prevent substantial detrimental effects to the environment. In a similar manner, Glasson *et al.* (2005) vividly indicated three main purposes of EIA including being an aid to decision-making, aid to the formulation of development actions and being an instrument for sustainable development. Furthermore, REMA (2006) reveals that there are immediate and long-term aims of EIA. The immediate aim is to inform the process of decision-making by identifying potentially significant environmental effects and risks of development proposals whereas the long-term aim is to promote sustainable development by ensuring that development projects do not undermine critical resources and ecological functions on the well-being, lifestyle and livelihood of communities and people who depend on them (REMA, 2006).

Thomas and Elliot (2005) and ECA (2005) reveal four objectives of EIA which are the following: to ensure that environmental considerations are explicitly addressed and incorporated into the development decision-making process; to anticipate and avoid, minimise or offset the adverse significant biophysical, social and other relevant effects of development proposals; to protect the productivity of natural systems and the ecological processes which maintain their functions; and to promote development that is sustainable and optimise resource use and management opportunities. In addition, UNEP (2004) suggests that EIA should be integrated into the project life-cycle to ensure that environmental information is provided at the appropriate decision points and the correct time which means that it should be applied as a tool to implement environmental management, rather than as a report to gain project approvals. At this point, EIAs should be applied to all proposed actions that are likely to have a significant adverse effect on the environment and human health. In a social context, particular attention should be given to vulnerable groups, such as indigenous peoples and local communities who depend upon the resource base for their sustenance or lifestyle (UNEP, 2004). Given the aim and benefit of EIA, it is clear that EIA is a process rather than a one-time activity. Lastly, Modak and Biswas (1999) reveal that the aim of EIA is to balance the environmental interests in the larger scheme of development issues and concerns and the primary objective of EIA is to ensure that the potential problems are foreseen and addressed at an early stage in the project's planning.

2.2.4 Steps in EIA process

Aucamp (2009) confirms that EIA is not a single action. Therefore, EIA is a process which has different steps. Even if each country can have its own peculiarity in its EIA process, the typical EIA steps are presented below in figure 2.1.

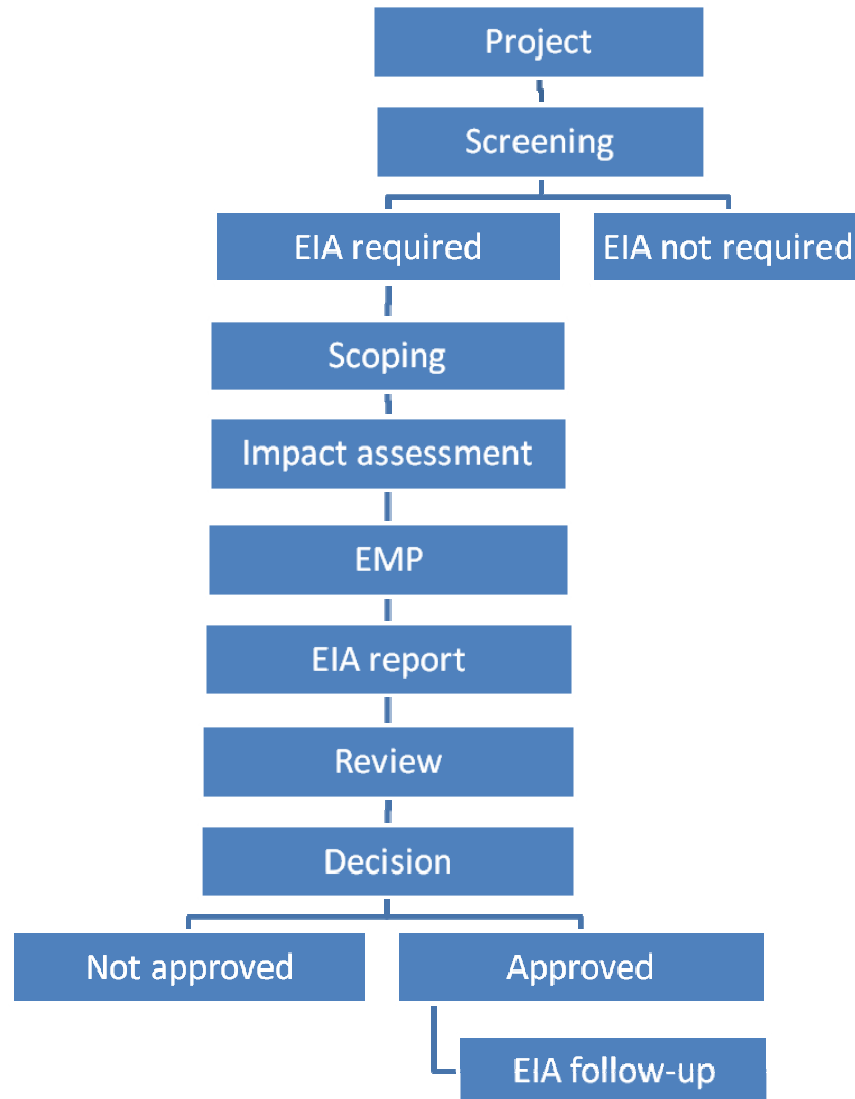


Figure 2.1: A generic EIA process (Aucamp, 2009: 87)

The above diagram also shows the steps where public and other stakeholders are involved. These steps are discussed in greater detail below.

2.2.4.1 Screening

Strictly, screening is not a part of the EIA process as it is the process used to determine whether an EIA is needed after submission of project brief to the competent authority. Aucamp (2009) defines screening as the process that determines the need for and the scale of an EIA. In general there are two main approaches to screening including the use of thresholds which involves placing projects in categories and setting thresholds for each project type. Glasson *et al.* (2005) argue that the approach may relate, for example, to the projects characteristics, anticipated project impacts and project location. However, Aucamp (2009) states that screening is usually a desktop study. However, if there is insufficient information to make the decision, some form of assessment needs to be done in order to gather more information (Aucamp, 2009). According to the RDB (2009), common methods for screening include: project threshold, sensitive area criteria, positive and negative list, and preliminary assessment. Furthermore, Glasson *et al.* (2005) stress that a case by case approach involves the appraisal of the characteristics of the projects, as they are submitted for screening, against a checklist of guidelines and criteria. Some of the advantages of using thresholds are that it is simple to use, quick and has more certainty while using case by case allows common sense and good judgment, flexibility and can improve easily (Glasson *et al.*, 2005).

2.2.4.2 Scoping

According to Aucamp (2009), scoping is the first critical step in the preparation of an EIA and it is defined as the identification of a number of priority issues, from a broad range of potential problems, to be addressed by an EIA. Scoping should begin with identification of all stakeholders (individuals, communities, civil society, local authorities and statutory consultees) likely to be affected by the project and bring them together with the developer to discuss and suggest the important issues to consider during the EIA study and eliminates those that are of little or no concern (REMA, 2006; Glasson *et al.*, 2005).

However, Glasson *et al.* (2005) reveal that some countries have a formal scoping stage, in which the developer agrees with the competent authority, sometimes after public

consultation, on the subjects the EIA will cover. The scoping report forms the basis for the terms of reference for the impact assessment or analysis phase (Weaver, 2003). In addition, the terms of reference (ToR) outlines the conditions and expected output of an environmental impact study. When the ToR has been approved by the authority, they are sent to the developer as authorisation to commence the EIA study (REMA, 2006).

2.2.4.3 Impact Prediction, Evaluation and Mitigation

According to Glasson *et al.* (2005), the object of prediction is to identify the magnitude and other dimensions of other identified change in the environment with project or action, in comparison with the situation without that project or action. In the similar manner, the same authors portray that the prediction should also identify direct and indirect impacts, the geographical extent of impacts, whether the impacts are beneficial or adverse, and the duration of the impact. Nevertheless, cumulative impacts which are considered individually minor but in combination, often over time, major are difficult to predict and are often poorly covered or are missing altogether from EIA studies (Aucamp, 2009). Therefore, Morris and Therivel (2001) stress that maps are essential in prediction and GIS can be a valuable tool not only as a sophisticated mapping tool that can relate different variables by spatially referencing data sets or layers but also as a form of modeling to represent or simulate the behaviour of the environment.

Once impacts have been predicted, there is a need to assess their relative significance. Therefore, Glasson *et al.* (2005) assert that criteria for impact significance should include the magnitude and likelihood of the impact and its spatial and temporal extent, the likely degree of the affected environment, the level of public concern, and political repercussions. In general, the most formal evaluation method of impact is the comparison of likely impacts against legal requirements and standards (Glasson *et al.*, 2005).

Mitigation entails the identification of ways in which negative impacts can be avoided or minimised to limit costs, and ways in which positive impacts can be enhanced to ensure maximum benefit (Aucamp, 2009; Weaver, 2003). In the similar vein, Aucamp (2009) asserts that potential alternatives must be analysed to find the most effective way of

executing the proposal, either through enhancing the environmental benefits of the proposed activity or through reducing and avoiding potentially significant negative impacts.

2.2.4.4 Participation, Presentation and Review

Different authors assert that public participation is a cornerstone of the EIA process (Glasson *et al.*, 2005; Wood and Hartley, 2005). Therefore, appropriate provision should be made for affected and interested parties to comment on a proposal and its impacts (UNEP, 2004). According to Glasson *et al.* (2005), public participation in EIA aims to establish a dialogue between the public and decision-makers and to ensure that decision-makers assimilate the public's views into their decisions. Furthermore, UNEP (2004) asserts that a requirement to make information available to the concerned public and seek their views and comments helps to ensure that EIA procedures are implemented in an open, transparent and accountable manner. During public hearings, affected and interested people contribute to raise and show the significance of economic, social and ecological problems which will be caused by the development action as well as their mitigation measures (REMA, 2006). The UNEP lists five interrelated components of effective participation, notably: identification of the groups or individuals interested in or affected by proposed project; provision of accurate, understandable, pertinent and timely information; dialogue between those responsible for the decisions and those affected by them; assimilation of what the public say in the decision; and feedback about actions taken and how the public influenced the decision (Glasson *et al.* 2005). Public participation occurs at different stages of EIA with various purposes. Therefore, Wood (2003b) asserts that local people can assist not only by helping to determine significance but also by providing baseline environmental data. However, effective public participation in the EIA processes has different limitations and constraints in the different countries, notably, limited democracy, cultural traditions, low levels of education and literacy, and gender inequality (UNEP, 2004).

According to Aucamp (2009), a single EIA report that contains the integrated findings of the scoping process, the impact assessment and mitigation studies can be produced to

enable the authorities to make a decision on the project. After impact assessment and mitigation measures, the compilation and integration of different specialist's reports of EIA makes an Environmental Impact Statement (EIS). Therefore, an EIS should be comprehensive and should explain why some impacts are not dealt with (Glasson *et al.*, 2005). Most of EIS are organised in four chapters including a non-technical summary, a discussion of relevant methods and issues, a description of the project, and a discussion of the likely impacts (ECA, 2005). Nevertheless, the size and organisation of EIS should be provided by EIA regulations of each country in order to harmonise this process of reporting. Furthermore, REMA (2006) reveals that the non-technical summary is very important for the public and decision-makers because it briefly covers all relevant impacts in the popular version which is easy to understand and contains a list or a table which allows them to identify their role and contribution in the EIA process. In addition, the use of maps, graphs, photo-montages, diagrams and other forms of visual communication can greatly help EIS presentation (Glasson *et al.*, 2005). Finally, the developer then submits the EIA report including the Environmental Management Plan (EMP) which is an action plan or management strategy for the implementation of mitigation measures identified in an EIA, and the addendum (if applicable) to the Authority (REMA, 2006).

The extent of formal provision for EIS review, within EIA regulations, varies considerably between countries and, sometimes, between different categories of projects. Therefore, the authority charged with the task of reviewing and approving EIS must officially review the EIA report and decide whether or not to authorise the application (Aucamp, 2009). Glasson *et al.* (2005) reveal that there are five categories of individuals or institutions who should review the EIS, notably, developers and their consultants who should review their own EIS report before submitting it to the authority; competent authorities depending on their responsibilities and power; official EIS review bodies like independent commissions and panels; statutory and non-statutory consultee organisations like environmental organisations with advisory status and environmental interest organisations like national and local nature conservation; and other organisations, both official and non-official. However, ECA (2005) shows that the EIS review system varies

from one country to another but different review systems have their own advantages and disadvantages, for example, a single agency review system is not effective in taking into account the views and concerns of other stakeholders while a very broad-based review system can cause delays in decision-making processes.

2.2.4.5 Decision-making and Appealing Process

The step of decision-making is very important since it determines the future of the project. Therefore, the decision is made within a specified period after reviewing the submitted EIS with the application for authorisation (Glasson *et al*, 2005). The competent authority is required to consider all necessary environmental information and consult all statutory consultees and the public in order to come up with a pertinent decision on a project (Momtaz, 2002). On the other hand, UNEP (2004) asserts that the conflicts of interest between consultee parties can impede the decision-making process and make the developer stuck in the middle because it is not easy to satisfy all parties at the same time. Aucamp (2009) argues that the manner in which EIS is presented and the suggestion of alternatives as well as the public pressure can highly contribute to influence the decision-making process. Therefore, the competent authority can grant permission for the project with or without conditions or refuse permission. Furthermore, ECA (2005) shows that the no development option is very difficult to consider in the development context but the emphasis of the assessment is on finding viable alternatives that would facilitate a successful outcome rather than no development outcome.

The process of appeal varies also from one country to another but the essence of it is that if the development is refused, the developer can appeal against the decision. However, Glasson *et al*. (2005) assert that if the development is permitted people or organisations can challenge the permission and appeal against that decision. For example, DEAT (2006) reveals that in South Africa, the appeal process begins with the appellant lodging a notice of intention to appeal within 10 days after being notified of the decision. The appeal must be lodged with either the Minister or the Member of Executive Council (MEC) of province, depending on who made the decision. However, the notice of intention to appeal does not have to contain all detailed reasons for appealing (DEAT,

2006). On the other hand, some countries do not provide the appealing process in their EIA procedures. In China, Wang *et al.* (2003) confirm that there is no appeal against the decision, if the conclusion is negative about either the EIA process followed or the quality of the EIS, the proponent is invited to resubmit an improved impact assessment. Furthermore, the current EIA legislation in Cameroon also provides no room for an appeal against the decision of the minister in charge of the environment (Alemagi *et al.*, 2007).

2.2.4.6 Monitoring and Auditing

After authorisation of the project, monitoring and auditing processes follows during project implementation. The main purpose of monitoring is to provide adequate information on the changes of variables in time and space and in particular on the occurrence and magnitude of impacts through a systematic and continuous measurement and recording of physical, social and economic variables with development impacts (Glasson *et al.*, 2005). According to Wood (2003a), environmental impact monitoring is an essential part of the EIA process, which forms part of its management component. Thus, the implementation of monitoring and auditing is the only mechanism available to establish further checks on the later stages of the project cycle (Ahammed and Nixon, 2006). Furthermore, monitoring is a good tool in project management because it facilitates the identification the anticipated impacts which help to rectify or address that change before being uncontrollable (Dipper *et al.*, 2000).

According to Dipper *et al.* (2000), EIA auditing refers to the examination of the performance of various aspects of the EIA system whilst the term post-auditing refers to the investigation of the accuracy of predictions made in the EIS. Environmental impact auditing involves the comparing of the impacts predicted in an EIS with those that actually occur after implementation, in order to assess whether the impact prediction performs adequately, in other words it is the investigations of accuracy of prediction made in the EIS (Ahammed and Nixon, 2006; Dipper *et al.*, 2000). Furthermore, the same authors show that the overall benefit of post-auditing is that in the long run it may, in theory, convert EIA from being a pre-decision paperwork exercise which aims simply

to obtain a development permit into a more accurate and useful tool to make EIA credible. On the other hand, the implementation of EIA auditing has different hindrances not only because it is regarded as a threat to and a criticism of the decision-making process but also given the limited resources in many competent authority organisations (Dipper *et al.*, 1998).

Ahammed and Nixon (2006) reveal that monitoring and auditing in EIA are defined in many ways and are referred to as follow-up actions and post-development audit. In addition, the same authors further reveal that it is widely accepted that monitoring and auditing in the EIA process is essential to verify the performance of the mitigation activities, compliance with regulatory standards, and the accuracy of impact predictions. However, different authors show that it is also widely believed that monitoring and auditing are the weakest areas in the EIA process globally (Ahammed and Nixon, 2006; Dipper *et al.*, 2000).

2.2.5 EIA and sustainable development

According to the World Commission on Environment and Development (1987), sustainable development is defined as development that meets the needs of the present without compromising the ability of future generations to meet their needs and aspirations. From this definition, the notion of sustainable development was introduced into the global environmental debate in the 1980s as an expression of the interdependence between economic development, natural environment and people (Weaver, 2003). Devnyst (2000) reveals that there are two possible ways to introduce sustainability principles in impact assessment including introduction of sustainability principles in the existing EIA and SEA legislation and guidelines, and developing of a separate system for sustainability assessment. This author further asserts that either option can be the most favourable solution, depending on the specific situation of the country or region. Figure 2.3 below summarises how EIA can help to achieve sustainable development.

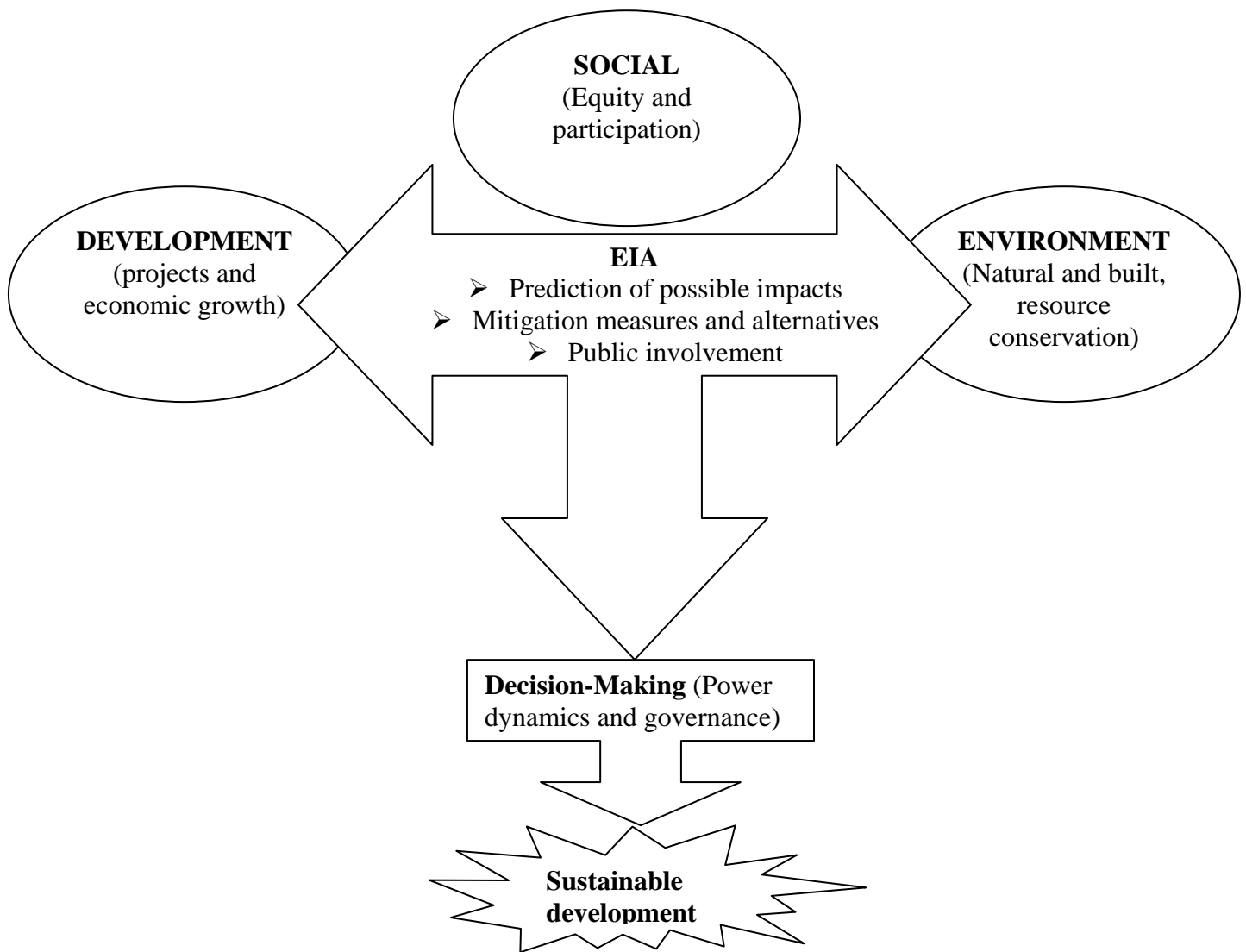


Figure 2.3: The link between EIA and sustainable development (Zeremariam, 2003: 12)

The above figure shows that EIA can be used to assess economic, social and environmental effects of the proposed project in order to inform decision-making process which can convey to the sustainable development. To assess if the project is economically feasible, the above figure shows that EIA can assess if a proposed project leads to economic growth without compromising the present natural and built environment. Further, to assess if the project is socially feasible, EIA facilitates the affected and interested people to participate in the planning stage of a proposed project to

assess the intended and unintended social consequences in order to bring about more sustainable and equitable biophysical and human environment (Vanclay, 2003). In addition, to assess if the project is environmentally feasible, EIA provides mitigation measures of significant impacts on the natural and built environment in order to protect, promote and conserve the resources. Therefore, the above tri-feasibility must be assessed in order to provide the necessary information for decision-making. In other words, the goal of EIA as an environmental management tool is to promote sustainable development (Modac and Biswas, 1999; Aucamp, 2009).

However, development and environment are two paradigms and one can conflict with the other. To address this challenge for sustainable development, UNEP (2004) reveals that EIA can be used because it includes prediction and evaluation of social, economic and environmental impacts.

The first and foremost characteristics of EIA which helps to achieve sustainable development is its capability of incorporating the concerns of affected and interested people, as Glasson *et al.* (2005) reveal that public participation in EIA aims to establish a dialogue between the public and decision-makers and to ensure that decision-makers assimilate the public's views into their decisions. In the similar manner, REMA (2006) asserts that during public hearings, affected and interested people contribute to raise and show the significance of economic, social and ecological problems which will be caused by the development action as well as their mitigation measures. The second reason that makes EIA a tool for sustainable development is its role as an aid for decision-making. EIA does not, in itself, obtain sustainable development but it can guide decision-makers in the right direction from the outset by including the costs of environmental protection measures and offering creative alternatives to harmonise the different requirements (Espinoza and Richards, 2002). On the other hand, Wilkins (2003) reveals that decision-making processes in EIA is constrained and misled by subjectivity, data gaps, simplified assumptions and politicised impact evaluation which aim to justify the project in order to secure funds rather than addressing critical issues. To illustrate the politicised evaluation in EIA, Wilkins (2003) asserts that during the EIA study of Kiambere George

Hydroelectric dam, the government of Kenya estimated three thousand people to be resettled while the World Bank estimated at least ten thousand people to be resettled.

The third reason that makes EIA a tool which helps a community to achieve sustainable development is its capability to enhance good governance. Since Kakonge (1998) asserts that EIA enhances transparency, information sharing, responsibility, accountability and public participation to help in environmental conflict resolution.

2.2.6 EIA in developed countries

The notion of developing and developed countries is based on the levels and standards of democratic governments, industrialisation, social programmes, and human rights respect in different countries. EIA started early in different developed countries. According to different authors, after its introduction in USA in 1970s, the EIA directive was also introduced in the member of states of European Union (EU) in June 1985 to be implemented by July 1988 (Baker and Wood, 1999; Glasson *et al.*, 2005). Furthermore, the 1985 EU directive was specifically stipulating the information that must be provided by the developer in the form of an environmental impact statement and preventing all competent authorities within the member countries from making a decision until consultation and public participation have taken place, then later on in 2001, the EU created Directive 2001/42/EC on strategic impact assessment which was implemented in 2004 although it had not been transposed yet into local law in some member states (Ramos *et al.*, 2008; Baker and Wood, 1999).

In different developed countries, EIA was introduced either as a planning tool or as an environmental management tool (Glasson and Salvador, 2000). Ahammed and Nixon (2006) state that in South Australia, EIA was formally introduced under the provisions of the Planning Act 1982 which was repealed and replaced by the Development Act 1993. In addition, EIA regulations and their implementation differ from one developed country to another because of various reasons. In USA, Espinoza and Richards (2002) reveal that a project is submitted to NEPA only if it needs the approval of a Federal Agency and if its action is important then the decision has to be made on a case by case basis.

Therefore, this made most agencies of different states in the USA to make their own list of actions with no potential impact called categorical exclusions. In Spain, criteria for performing the assessment are linked with the direct and indirect effects on the population, fauna, flora, soil, air, water, climatic factors, noise, vibrations, odours, luminous emissions, landscape, and material goods including historical, artistic and archaeological heritage (Espinoza and Richards, 2002). According to Fitzpatrick and Sinclair (2009), Canada also provides an interesting EIA system where EIA is one process of environmental decision-making with multi-jurisdictional implications, as the federal and provincial governments all have legislated EIA requirements. Thus, each jurisdiction has EIA roles and responsibilities and as a consequence, each is bound to make a decision on a project that is in their authority. However, three approaches to inter-jurisdictional coordination have been considered in Canada, including standardisation, harmonisation and substitution (Fitzpatrick and Sinclair, 2009). To illustrate the harmonised approach of EIA in Canada, Fitzpatrick and Sinclair (2009) assert that Wuskwatim projects (construction of a low dam head and three 230 KV transmission line segments) in Manitoba province triggered reviews by both the federal and provincial governments and became the first large-scale harmonised EIA completed under the terms of the Canada-Manitoba on agreement on environmental cooperation.

Furthermore, Holm-Hansen (1997) asserts that the difference between Nordic countries' (Denmark, Sweden and Norway) and Baltic countries' (Estonia, Latvia and Lithuania) EIA systems is observed in different perspectives which include the following: most of the staff of Baltic EIA system are engineers and natural scientists; the system is closed and responsibilities are concentrated in the EIA offices of the ministry and regional environmental departments while the Nordic EIA system is staffed by experts on natural, legal, economic, and social sciences as well as technicians. Furthermore, open system and EIA tasks are dispersed in various ministries by developers, Non Government Organisations (NGOs) and sectoral and local authorities. Therefore, the above characteristics impact on EIA practice in one way or another. For instance, the problem of EIA which is staffed by natural scientists only is that EIA focuses on effects instead of impacts and focuses on ecology rather than the environment (Holm-Hansen, 1997).

Similarly, the same author asserts that the introduction of EIA in European countries is different because of their different background, for example, in Norway the main task was to avoid overlap by unifying and streamlining already existing practices while the Estonia's problem involves the creation of the administrative and political structures to uphold the EIA provisions (Holm-Hansen, 1997).

However, different authors show that even if EIA in developed countries is better, it still has many challenges and weaknesses. Espinoza and Richards (2002) portray that the weaknesses that arises in the application of the NEPA in the USA are associated with the lack of an accepted set of methods and criteria to ensure the objectivity of EIAs, the fact that environmental impact studies and statements are so extensive and time-consuming, the inadequacy of the response to how cumulative impacts should be assessed and lastly, the absence of control of mitigation measures during the construction and operation phases of the projects. In the similar vein, an evaluation of EIA system performance in eight EU countries shows that the main challenges of EIA are limited details of scoping methods and coverage mainly confined to direct impacts; limited explanation given both to quantitative estimation of magnitude of impacts and to assumptions and value judgments used in the evaluation of impacts; where alternatives were covered, they mainly related to site selection; mitigation measures were not always described in the reports and, where they were, details provided about their implementation and effectiveness were often limited and finally; monitoring provisions were rarely covered in the reports (Baker and Wood, 1999). Wood (2003a) evaluated the status of monitoring and auditing in seven EIA jurisdictions of the developed world including the USA, United Kingdom (UK), the Netherlands, Canada, Australia, New Zealand and South Africa, and he found none of them to fully meet his evaluation criteria. This is considered as a major weakness of EIA globally.

In addition, Wilkins (2003) reveals that for an EIA system to facilitate free and open dialogue and sustainable development in developed countries, the process must reflect local and cultural attitudes to decision-making, be sensitive to the attitudes and opinions of the people potentially affected by the project, address the needs of future generations

and provide a forum for social learning. However, Devnyst (2000) asserts that in many regions local authorities are not involved in EIA. A survey among local authorities in the Flemish region of Belgium show that neither EIA at project-level, nor SEA at higher levels of decision-making are frequently used in local communities (Devnyst, 2000). Lastly, Benson (2003) reveals that consideration of cumulative effects in EIA is an important factor which contributes to more sustainability. However, he further reveals that there is little or no authoritative guidance on cumulative effects assessments in UK and EU, especially by comparison with North America (Benson, 2003).

Concerning the institutional framework of EIA, it is shown by different authors that EIA responsibilities are dispatched in a different department or in a specialised institution like NEPA in the USA (Glasson *et al.*, 2005) and the Canadian Environmental Assessment Agency (CEAA) in Canada (Fitzpatrick and Sinclair, 2009). On the other hand, the central government, through the Department of Environment, Transport and Regions (DETR) in the UK has a key role in making regulations and providing guidance for EIA but there are some regional variations like Scotland and Northern Ireland (Glasson and Salvador, 2000). Furthermore, the same author reveals that since implementation of the European Commission directive, more than 3000 EIS have been produced in the UK but the annual output has fluctuated with the economic cycle, and the maximum is more than 350 per annum (Glasson and Salvador, 2000). In developed countries, different projects are subjected to EIA at different rates. For example, in the UK, Glasson and Salvador (2000) assert that the main classes of projects have been waste disposal (22%), roads (18%), industrial and urban (18%), extraction (14%) and energy (13%).

EIA process and practice in developed countries is different from developing countries because of the level of development which goes together with the level of qualified EIA practitioners (EIA officers and consultants) and the complexity of EIA regulations due to the international as well as regional projects encountered in developed countries. However, Glasson and Bellanger (2003) reveal that French consultancies tend to be smaller and more numerous than in the UK. This makes consultants more dependent on developers who are becoming increasingly part of the private sector in France.

Furthermore, the roles of French central government in EIA are that it has most of the regulatory powers, it tends to dictate rigid rules and it has considerable influence over the decisions taken by local authorities (Glasson and Bellanger, 2003). On the other hand, Morrison-Saunders and Bailey (2009) assert that the EIA practitioners surveyed in Australia were well experienced with 24 (39%) having worked for more than 15 years as an environmental professional and only nine (15%) had worked for less than five years.

2.2.7 EIA in developing countries

EIA is now established in many countries in the developed and developing world. However, EIA systems in developing countries vary greatly in procedures and practice. Glasson and Salvador (2000) show that some countries have clear regulations, others have guidelines, others have more *ad hoc* procedures but they reveal also that those with well established procedures may not necessarily be those with the most well established practice. Definitions of EIA in developing countries also vary. ECA (2005) asserts that Ghana's definition of EIA relies on environmental, socio-economic, cultural and health effects while Cameroon's definition of EIA makes reference to impacts on the standard and quality of life of the population and environment in general. The same author reveals that those two mentioned ways of defining EIA are also different from Tunisia's definition of EIA which focuses on environmental impacts only.

The level of development and industrialisation also contribute greatly to the establishment and application of EIA in developing countries. This section of EIA in developing countries also discusses EIA processes in Africa, Asia and Latin America.

2.2.7.1 EIA in South America

In Latin America, the oldest EIA system is found in Brazil. Glasson and Salvador (2000) reveal that the first EIA of a hydroelectric project in Brazil was undertaken in 1972 and also assert that the institutional framework for EIA in Brazil is wider than in most EU countries because it has three distinct levels of regulators at the federal (National), at state (regional) and municipal (local) levels. Espinoza and Richards (2002) reveal that Ecuador

does not have a single national compulsory system to evaluate environmental impacts derived from human activities but the authority that coordinates the application of environmental policies including EIA is trying to establish a single EIA system that will integrate both the public and private sectors and civil society in general. The Chilean EIA system is decentralised in 13 regions and its main characteristics are: it is a voluntary system; and its procedure is incomplete since key topics are yet to be developed, such as citizen participation and the use of EIS (Espinoza and Richards, 2002). Challenges of EIA in Latin American countries are various but those that are common are the following: in Brazil, the more developed states have more resources to implement EIA than poorer and less developed states; lack of adequate baseline data; the lack of terms of reference or its inadequate elaboration results in a low quality of EIS and it makes EIS review difficult; indirect or cumulative impacts are not well identified or properly assessed; public participation is very limited by the fact that EIS are not in the language accessible to the public and there is no requirement of non-technical summary; the discussions of EIS are highly influenced by political and economic pressures and finally, EIA is reactive to the projects (Glasson and Salvador, 2000).

2.2.7.2. EIA in Asia

In Asia, introduction and legislation of EIA also differ from one country to another. Paliwal (2006) reveals that in India, the first EIA was carried out during the early 1980s on the Silent River Valley hydroelectric project and later the project was abandoned and Silent Valley was declared as a national park. Paliwal (2006) also portrays that the Ministry of Environment and Forest in India only passed an EIA notification in 1994 under the Environmental Protection Act of 1986 while in China, Wang *et al.* (2003) show that Environmental Protection Law which is the backbone of EIA legislation was drafted after the establishment of the Environmental Protection Office in 1974 and the first official EIA was carried out in 1979 for a copper mine. Momtaz (2002) asserts that legislative bases for EIA in Bangladesh are the Environmental Conservation Act of 1995 and Environmental Conservation Rules of 1997 while in Indonesia, Purnama (2003) reveals that EIA has been implemented since 1982 through Basic Provisions for Environmental Management Act. EIA was practiced in Indonesia before it established

Indonesia's legislation. According to Purnama (2003), the first EIA in Indonesia was produced in 1974 for a cement factory and the Saguling dam construction in West Java. Different specific EIA guidelines were developed to complement EIA general guidelines. However, Momtaz (2002) reveals that also all major donor agencies working in Bangladesh like CARE International, USAID, World Bank (WB) and Asian Development Bank (ADB) have their own EIA guidelines. This fact also shows that EIA in developing countries tends to be required by the funding agency.

EIA administration, the competent authority as well as review body for EIA also differ from one country to another. Paliwal (2006) reveals that the existing EIA process in India is administered by central and state authorities. At central level, the Impact Assessment Division under Ministry of Environment and Forest (MoEF), regional offices of MoEF and the Central Pollution Control Board are three important institutions whereas state departments of environment are working at the province level (Paliwal, 2006). According to Wang *et al.* (2003), within the State Environmental Protection Agency (SEPA), the Department of Supervision and Management is in charge of overseeing and coordinating EIA implementation in China, while the newly established EIA review committee is responsible for reviewing and making decisions on the EISs and require SEPA approval when it is a cross-boundary project. Furthermore, Momtaz (2002) asserts that the Department of Environment (DoE) under the Ministry of Environment and Forest is the regulatory body responsible for enforcing the Environmental Conservation Act and EIA in Bangladesh. In Asian countries EIA has different strengths and weakness as shown by different authors. The strength, weakness, opportunity and threat (SWOT) analysis of EIA in India reveals that its strengths are well defined legal structure and presence of well-knitted regulatory structure while it has many weakness including insufficient baseline data, improper monitoring and implementation, poor quality of EIA reports and poorly defined decision-making (Paliwal, 2006). In a similar vein, Wang *et al.* (2003) stress that the main challenge of EIA in china is that effective public involvement is largely missing from its EIA system, both in terms of statutory support and in practice. The same author reveals that there are three reasons of ineffective public involvement in China, notably, EIA is a top-down administrative instrument, EIA has a highly scientific

and technical and engineering backgrounds, and the last reason is huge population and lack of political will, especially at the local level (Wang *et al.*, 2003).

2.2.7.3 EIA in Africa

In Africa, the EIA system of most developing countries is still in their infancy and varies. According to ECA (2005), a review of the application of EIA in 23 selected African countries reveals that 78% had already established EIA processes, 65% already had specific legislation and regulation, 61% had general guidelines, 22% had formal provision for public participation and all 23 had the main administrative body of EIA. However, Spong *et al.* (2003) stress that EIA is not a legal requirement in Zimbabwe, since the Natural Resources Act of 1941 does not cover EIA. Therefore, after publishing EIA policy and EIA guidelines in 1997 in Zimbabwe, EIA is administered by one EIA officer and eight regional officers in the Department of Natural Resources of the Ministry of Environment and Tourism (Spong *et al.*, 2003).

The main administrative bodies of EIA in most African countries are the Ministry of Environment or specialised government bodies. ECA (2005) shows that countries which have the Directorate of the Environment in the Ministry of Environment as the main administrative body of EIA are Algeria, Niger, Cameroon, Congo, Gabon and Burundi. Similarly, different authors assert that Mozambique has eight EIA professionals, Namibia has two EIA professionals and Mauritius has seven EIA professionals and these countries also have Directorate of the Environment as the main administrative body (Baissac, 2003; Hatton *et al.*, 2003; Weaver, 2003). In addition, Rossouw *et al.* (2003) and ECA (2005) show that the Department of Environment (DoE) is the main administrative body for Morocco and South Africa with six professionals and one hundred and ninety eight (198) provincial EIA professionals.

In a similar manner, different authors also show that countries which have specialised government bodies like the National Environmental Protection Agency as the main administrative body of EIA in Benin, Gambia, Ethiopia (ECA, 2005), Ghana (Opoku, 2001) and Tunisia (Ahmad and Wood, 2002) while Uganda and Kenya have National

Environmental Management Agencies (NEMA) (ECA, 2005). Some countries also have Environmental Councils as the main administrative bodies of EIA including Zambia, Sudan and Tanzania. Zambia has five EIA professionals (Chapman and Walmsley, 2003) whereas the Environmental Councils in Sudan and Tanzania are working under the office of Vice-President (ECA, 2005). However, Nigeria is the only country which has a Federal Environmental Protection Agency as the main administrative body of EIA (Ogunba, 2004). Similarly, Lesotho is the only country which has a National Environmental Secretariat as the main administrative body of EIA and it also has three EIA professionals (Motsamai *et al.*, 2003; Mokhehle and Diab, 2001). Finally, Mpotokwane and Keatimilwe (2003) reveal that EIA in Botswana is administered by the National Conservation Strategy Agency which has four EIA professionals.

Beside the low number and high turnover of EIA officers in the African countries, qualification and responsibility of EIA officers are also a serious concern. To illustrate this statement, Spong *et al.* (2003) reveal that Department of Natural Resources (DNR) in the Ministry of Environment and Tourism of Zimbabwe experienced a high turnover of staff with EIA skills. During the last eight years, DNR has lost five EIA specialists who completed their masters in Environmental Policy and Planning at the University of Zimbabwe, and currently relies on one person to coordinate all EIA activities and he has also to undertake other duties like developing an environmental information system (Spong *et al.*, 2003). The same author argues that the reason of this high turnover is poor remuneration in the public service. Furthermore, Hatton *et al.* (2003) assert that six of the eight EIA professionals in the directorate of EIA in Mozambique hold a bachelor of science (BSc), mostly in biology degrees while other two staff members are still doing their Bachelors. In addition, Motsamai *et al.* (2003) show that National Environmental Secretariat in Lesotho currently has three officers in the EIA division but who have also other responsibilities such as the management of capacity-building. Weaver (2003) reveals that EIA implementation also is influenced by different policies existing in different countries. Mpotokwane and Keatimilwe (2003) state that there are several policies which are relevant to the EIA process in Botswana including land policy, national policy on natural resource conservation and development, tourism policy,

national water master plan, national settlement policy and national policy on agricultural development.

EIA challenges in African countries are similar because of their level of industrialisation and how EIA was introduced in those countries. In most African countries, the level of literacy is low and this impacts seriously on the way people participate either in predicting of the effect of the planned projects or in articulating their views to help decision-makers (ECA, 2005). Secondly, Mokhehle and Diab (2001) reveal that public participation is constrained by the weaknesses of the EIA process itself in developing countries like understaffing, lack of qualified practitioners and shortage of resources. Furthermore, Momtaz (2002) reveals that in the context of African countries, most of the projects are planned and implemented by the government. Therefore, public participation is not encouraged because of the fact that the aim of the EIA in African countries' context is to justify the project and secure funds rather than integration of concerns of affected and interested people to inform decision-making (Momtaz, 2002). The third reason of ineffectiveness of EIA and public participation in African countries' context is the cost of the EIA process. Because of the limited resources, the EIA processes are still expensive in developing countries so it is difficult to afford the cost of EIA in rural areas (Momtaz, 2002). Scott and Oelofse (2005) assert that the fourth and foremost reason for the ineffectiveness of public participation in peri-urban areas is that invisible stakeholders (poor and marginalised people) are not included in the EIA process. The last barrier to public participation in the EIA process in African countries is gender inequality. In most rural areas public meetings are attended mostly by men and even the few women present do not have the opportunity to express their concerns (UNEP, 2004).

2.2.8 EIA in Rwanda

After discussing EIA in developed and developing countries, this section traces the background of environmental awareness and EIA in Rwanda. Furthermore, EIA legislation, EIA administration and the process of EIA in Rwanda are discussed in this section.

2.2.8.1 Background of environmental awareness and EIA in Rwanda

GoR (2003a) reveals that awareness of environmental issues in Rwanda goes back to the colonial period when actions aimed at the protection and conservation of environment were undertaken at different periods, notably, re-forestation activities started in 1920, specifically the creation of Albert Park in 1925 (which became the Natural Forest of Nyungwe as a reserve forest in 1933) and the Akagera National Park in 1935. These environmental friendly initiatives were also supported by a vast campaign for soil conservation initiated by Institut National pour l'Etude Agronomique au Congo (INEAC) later known as the Institut des Sciences Agronomiques du Rwanda (ISAR). Since 1937, it started first in research stations, before extending to the whole country in 1947. It is also this time when soil conservation activities were made compulsory by colonial law (GoR, 2003a).

After independence, GoR (2003a) also asserts that a division of hygiene and environment was created in the Ministry of Health and Social Affairs in 1983 and the first national seminar on environment which recommended the development of a National Environment Strategy was organised by this Ministry in 1985. According to GoR (2003a), in 1989 the Environment and Development Project in the Ministry of Planning was created, which later became the National Environment Unit, a springboard for the establishment of the Ministry of Environment and Tourism (MINETO) in 1992, the duties of which included, among others, the coordination of all environment related activities carried out by different ministries and drafting of the Law on Environment. However, REMA (2009) asserts that the 1994 Tutsi genocide brought to a standstill the initiatives that had been launched, and they were revived by the Government of National Union. It is in this context that Rwanda initiated different environmental projects and also ratification of International Conventions such as the Convention on Biological Diversity (1995), United Nations Outline Convention on Climatic Change (1998), United Nations Convention on Desertification (1998), Vienna Convention for the Protection of the Ozone Layer (2001), Stockholm Convention on Persistent Organic Polluting Agents (2002), Ramsar Convention on Wetlands (2003), Convention on the Conservation of Migratory Species of Wild Animals (2003), Convention on the Prior Informed Procedure for Certain

Hazardous Chemicals and Pesticides in International Trade (2003), Basel Convention on Control of Transboundary Movements of Hazardous Wastes and their Disposal, and Kyoto Protocol to the United Nations Convention on Climate Change.

Furthermore, GoR (2003a) stresses that National Agenda 21 and the National Environment Strategy and Action Plan were updated in 1996 and also following the Government reshuffles of 28th March 1997 and 8th February 1999, the environment was successively placed under the Ministry of Agriculture, Animal Breeding, Environment and Rural Development and the current Ministry of Lands, Resettlement and Environment which became Ministry of Natural Resources, Environment and Mines (MINIRENA). The principal mission of this Ministry is to formulate the policy and the law relating to the protection of environment. Moreover, in 2001, the Ministry was strengthened by the establishment of the Ministry of State responsible for the Protection of Environment, which became operational from August 2001. Thereafter, this Ministry of State became a separate Ministry of Environment and Land (MINELA) in December 2009 till now.

Since 2003, the GoR started the process of the establishment of the REMA and finalised the process after enactment of Law No. 16/2006 of 03/04/2006 determining the organisation, functioning and responsibilities of REMA. According to GoR (2006), REMA is the authority in Rwanda in charge of supervision, follow-up and ensuring that issues relating to environment receive attention in all national development plans. Therefore, one of the main responsibilities of REMA is to examine and approve EIA reports at any level of socio-economic activities undertaken by any person or organisation.

2.2.8.2 EIA legislation in Rwanda

The Constitution of the Republic of Rwanda, adopted in June 2003, ensures the protection and sustainable management of environment and encourages rational use of natural resources (GoR, 2003b). Therefore, the legislative base for EIA in Rwanda are the Environmental Organic Law No.04/2005 of 2005 which determines the modalities of

protection, conservation and promotion of environment in Rwanda; Ministerial order No 003/2008 of 2008 relating to the requirements and procedure for environmental impact assessment; and Ministerial order No 004/2008 of 2008 establishing the list of works, activities and projects that have to undertake environment impact assessment.

According to GoR (2005), the fourth chapter of environmental organic law is dedicated to EIA, especially in the following articles: Article 67 stipulates that every project shall be subjected to an EIA, before obtaining authorisation for its implementation. Article 68 portrays issues that an EIA shall at least indicate and Article 69 stipulates that an EIA shall be examined and approved by the REMA or any other person given a written authorisation by the authority.

Furthermore, the ministerial order relating to the requirements and procedure for EIA commonly known as EIA regulations encompasses the following provisions: application for authorisation, ToR of the environmental impact study, selection of experts to conduct environmental impact studies, the environmental impact study, submission of the environmental impact study report, analysis of environmental impact study report by the authority, public participation, decision-making and authorisation, appeal of the developer and committees in charge of analysing and taking decisions, including *ad hoc* technical committee and executive committee (GoR, 2008a).

According to GoR (2008b), the list of works, activities and projects that have to undertake an EIA include construction projects (infrastructure), agriculture and animal husbandry activities, works in parks and in its buffer zone, and works of extraction of mines. However, this ministerial order also stipulates that REMA has the power to order a developer to conduct an EIA to be done for a project that is not on the list if it is evident that there is a possibility for the project to have negative effects on the environment.

2.2.8.3 EIA administration in Rwanda

The EIA process in Rwanda started in 2005 and became a legal requirement after the enactment of Organic Law No.04/2005 of 2005 determining the modalities of protection,

conservation and promotion of environment in Rwanda. Since the introduction of EIA in Rwanda, the main EIA administrative body was REMA through DEIACE. Therefore, according to Article 69 of the Environmental Organic Law stipulating that EIA is administered by REMA or any other person given a written authorisation by the Authority, DEIACE was transferred to the RDB. Therefore, since February 2009, RDB became the EIA administrative body through its unit of Environmental Compliance, Awareness and Cleaner Production.

REMA's annual report (2005) reveals that DEIACE started in 2005 with three members of staff including two environmental officers and the Director of this Department. Later on, in 2006, the number of environmental officers was increased to five. By 2008, the number had increased to eight members of staff of DEIACE. Before the transfer of DEIACE to RDB, it had seven environmental officers and the Director of the Department. Also, before the merger, REMA's (2006:4) organisation and structure reveals that DEIACE's main responsibilities were the following:

- To enforce environmental standards, norms, guidelines and procedures;
- To ensure compliance through environmental monitoring;
- To facilitate voluntary compliance to environmental law;
- To coordinate the assessment of the impact of pollutants emanating from different sources such as industry;
- To identify how capacities of national institutions to manage hazardous wastes can be strengthened;
- To propose and facilitate implementation of pollution abatement measures;
- To facilitate organisations to implement environmental management systems in their development projects;
- To plan and prepare inspections based on review and analysis of background information related to the operation to ensure compliance;
- To promote the inspection function as an essential tool for enhancing the quality of management and for ensuring accountability;
- To develop water and air pollution systems;

- To develop training and public information materials related to environmental management;
- To advise on environmental requirements to developers, the public and Councils so as to encourage environmentally friendly technologies;
- To cooperate with national and international institutions to facilitate a cohesive implementation of pollution control plans and activities at all levels; and
- To provide technical input in negotiating and implementation of international and regional conventions, protocols and treaties relating to environmental management; and implement any other duty as may be assigned by the Head of the Unit.

In addition, apart from above mentioned generic responsibilities, REMA (2006:20) submits that REMA's roles and responsibilities regarding specifically EIA processes in Rwanda are the following:

- Receive and register EIA applications (project briefs) submitted by developers;
- Identify relevant lead agencies to review project briefs and provide necessary input during screening;
- Review project briefs and determine project classification at screening stage;
- Transmit project briefs to relevant lead agencies and concerned local governments to provide input on ToR;
- Publicise project briefs and collect public comments during development of ToR,
- Approve EIA experts to conduct EIA studies;
- Receive EIA documents submitted by a developer and verify that they are complete;
- Transmit copy of EIA Reports to relevant lead agencies, local governments and communities to review and make comments;
- Review EIA reports and make decisions on approval, organise and conduct public hearings, appoint an officer from authority to chair public hearings, receive public comments and compile public hearing reports;
- Appoint the technical committee and its representative to the technical committee;

- Appoint the an executive committee, and its representative to the technical committee;
- Forward EIA documents (EIA Report, Environment Monitoring Plan and Public Hearing Report) to the technical committee;
- Chair the executive committee which makes final decision on approval of a project;
- Communicate decision on whether or not a proposed project is approved;
- Issue to developers EIA certificate of authorisation if their projects are approved; and
- Enforce compliance through inspection, environmental monitoring and auditing.

However, considering the above mentioned responsibilities and the number of environmental officers operating in the country, REMA reports reveals that it is not easy to combine EIA responsibilities and others, especially in a country which is developing rapidly like Rwanda because of the large number of EIA applications. Therefore, shortage of staff and resources emerged as the biggest hindrance faced by environmental officers. The qualification requirements for the Director of DEIACE should be an advanced university degree (Masters) in either environmental sciences, ecology, biology, chemistry, rural engineering or civil engineering and at least five years of progressively responsible experience in environmental management, good knowledge of regulations and standards setting systems while for environmental officers, qualification requirement is a bachelors degree in either environmental sciences, ecology, biology, chemistry, rural engineering or civil engineering and three years experiences in environmental management, engineering or a related field (REMA, 2006).

Since the introduction of EIA in 2005, REMA completed and issued seventy six certificates of EIA to some of the submitted projects. The table below shows the number and categories of projects submitted to REMA as well as the number of certificate issued per each category of project.

Table 2.1: Projects received during the period of May 2005-July 2008 (REMA, 2008: 4)

Project Type	Number of projects received	% of total	Number of certificates	% of total
Construction	102	20.56	26	34.21
Hotels	70	14.11	18	23.68
Industry	68	13.71	11	14.47
Mine and Quarry	37	7.46	4	5.26
Agriculture	44	8.87	2	2.63
Station service	22	4.44	6	7.89
Energy	20	4.03	8	10.53
Food processing	5	1.01	1	1.32
Others	128	25.81	-	-
Total	496	100	76	100

The above table from REMA's annual report (2008) also indicates that EIA certificates issued are not even the half of the number of the projects submitted. Since the total number of projects submitted is 496 while the number of certificates issued is only 76. Furthermore, construction projects emerged as the highest number of projects (20.56%) subjected to EIA in Rwanda and also as the highest number of certificates (34%) issued by REMA. It is imperative also to mention that the above table show other types of projects submitted to EIA at different rates, including, hotels (14.11%), industries (13.71%), mines and quarries (7.46%), agriculture (8.87%), station services (4.44%), energy (4.03%), food processing (1.01%) and others with 25.81%.

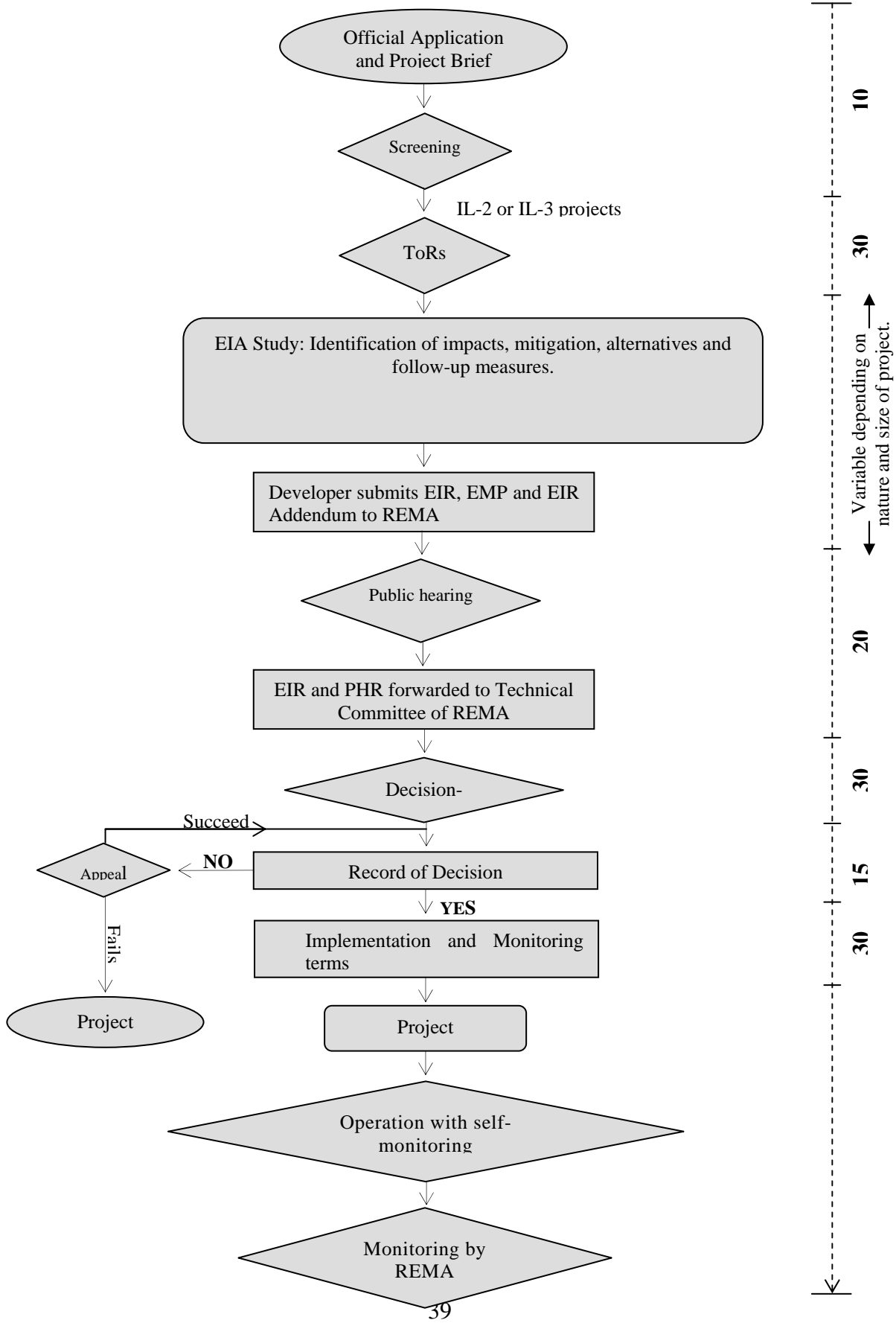
The EIA consultancy industry in Rwanda is still small since REMA approved only twenty four EIA consultants. The list of EIA experts approved by REMA is listed in Appendix 1.

2.2.8.4 EIA process in Rwanda

The Organic Law on Environment Protection made EIA mandatory for approval of major development projects, activities and programmes in the Republic of Rwanda. However, besides the legislation, guidance is needed of a more technical nature to streamline the

conduct of EIA and appraisal of EIA reports. Therefore, REMA (2006) stresses that the establishment of General Guidelines and Procedures for EIA in 2006, which unifies the legal requirements with the practical conduct of EIA, contributed to the improvement of EIA practice in Rwanda.

General EIA guidelines of 2006 show that EIA process in Rwanda involves the following four stages starting with the environmental impact initiation phase involving screening and scoping. Following this is the impact study phase, which includes impact identification and analysis, development of mitigation measures and preparation of the report. The decision-making and authorisation phase entails review of EIA reports and to either approve or disapprove a project. Lastly, environmental management and follow-up phase deals with monitoring aspects of the project during its implementation. Figure 2.2 below shows the steps and the duration of each step of EIA in Rwanda.



Duration of each stage (Working Days)

Figure 2.2: EIA process chart in Rwanda (REMA, 2006: 39)

The REMA annual report (2008) asserts that during the second EIA sector guidelines validation workshop of 2008, the following EIA sector guidelines: Audit Guidelines, Waste Management Guidelines, Water Resources Guidelines, Wetland Management, Road Construction Guidelines, Hydroelectric Power Development Guidelines and Housing Development were developed to supplement and help EIA general guidelines and stakeholders to address specific project impacts accordingly. Therefore, all of these mentioned sector guidelines were validated in 2009.

2.3 Strategic Environmental Assessment

In the bid to revise how EIA can address economic, ecological and social issues sustainably, the SEA has been introduced to supplement EIA. Fischer (2003) stresses three reasons of establishing SEA, notably, to provide input on environmental and sustainability issues to planning or decision-making; to reduce the number and complexity of project EIAs; and to assess cumulative impacts and identify sustainability indicators. At this point, SEA is defined as a decision-making support instrument for the formulation of sustainable spatial and sector policies, plans and programmes, aiming to ensure an appropriate consideration of the environment (UNEP, 2004; Fischer, 2003). In a similar manner, Alshuwaikhat (2005:309) defines SEA as *“a formalised, systematic and comprehensive process of evaluating the environmental impacts of a policy, plan or programme and its alternatives, including the preparation of written report on the findings of that evaluation, and using the findings in publicly accountable decision-making”*. The table below shows the difference between EIA and SEA.

Table 2.2: The comparison of EIA and SEA (CSIR, 1996 cited in ECA, 2005: 9)

EIA	SEA
Is usually reactive to a development proposal	Is pro-active and informs development proposals
Assesses the effect of a proposed development on the environment	Assesses the effect of a policy, plan or programme on the environment, or the effect of the environment on development needs and opportunities
Addresses a specific project	Addresses areas, regions or sectors of development
Has a well-defined beginning and end	Is a continuing process aimed at providing information at the right time
Assesses direct impact and benefits	Assesses cumulative impacts and identifies implications and issues for sustainable development
Focuses on the mitigation of impacts	Focuses on maintaining a chosen level of environmental quality
Has a narrow perspective and a high level of detail	Has a wide perspective and a low level of detail to provide a vision and overall framework
Focuses on project-specific impacts	Creates a framework against which impacts and benefits can be measured

The above table 2.2 shows that the difference between SEA and EIA is that SEA can help more to achieve sustainable development than EIA since SEA is introduced to assess cumulative effects and the effect of a policy, plan or programme on the environment and vice versa. However, the advantage of EIA is that it has narrow perspective and a high level of details. Therefore, even if the above table shows the difference between the two tools it also shows that one supplements to another.

In a similar vein, Weaver (2003) reveals that SEA is much more likely to promote sustainable development than project-level EIA because it helps to incorporate sustainable development considerations early in the strategic decision-making process. Furthermore, Morrison-Saunders and Fischer (2006) reveal that SEA emerges as a possible solution for the integration of economic, social and environmental aspects in

planning so that SEA can be based on objectives by which sustainable development can be defined. In addition, Fischer (2003) asserts that public participation in SEA provides a crucial view of people's ways of understanding problems connected with policy, plan and programme making and it can make the whole planning process more efficient and reliable. Fischer (2003) further believes that besides considering environmental and socio-economic aspects and pro-active objectives-led decision-making, SEA also includes the consideration of the quality of life of future generations. To support Fischer's opinion, Alshuwaikhat (2005) reveals that the identification of serious environmental threats in proposals of policy, plans or programme will cause a reduction in the number of project-based impacts. Alshuwaikhat (2005) also submits that SEA offers an opportunity to address cumulative effects, which cannot be properly handled by EIA because of the pervasive nature of cumulative effects and large-scale environmental change.

On the other hand, SEA is constrained by different factors, especially in developing countries (Morrison-Saunders and Fischer, 2006). In the similar vein, UNEP (2004) reveals that SEA is a recent tool and therefore in developing countries, there is a small number of countries which have SEA processes in place. In addition, Alshuwaikhat (2005) submits that in some countries (Sri Lanka, Vietnam and Saudi Arabia) environmental assessment, especially SEA, was introduced with insufficient staffing, experience and monitoring; with evaluation inadequacies; and without enough baseline data. Furthermore, many developing countries give lower priority to environmental assessment, especially at the policy level, in dealing with poverty alleviation, economic growth and development and, sometimes, political stability (Alshuwaikhat, 2005).

Different authors (Alshuwaikhat, 2005; Devnyst, 2000; Glasson *et al.*, 2005) offer some recommendations as a way forward for better implementation of SEA. Alshuwaikhat (2005) recommends that SEA should be established in local municipalities and a need of SEA training. Devnyst (2000) also recommends that SEA system should be simple and flexible and further scientific research. Lastly, Glasson *et al.* (2005) recommend extensive public participation, including the public and NGOs and that developing

countries should develop SEA directive on the regional level as European Union. This will facilitate the implementation of SEA. Following the above discussions, SEA can never replace project level EIA but it strongly reduces the effort and resources (for example time and cost) involved in project EIAs.

2.4 Conclusion

EIA and SEA are important environmental tools not only for developed countries but also in developing countries. Thus, different authors confirm that the main goal of EIA and SEA is to promote decision-making that leads to sustainable development. After discussing the definition and objective of EIA, this chapter examined relevant literature and discussed the state of EIA in developed as well as developing countries. Furthermore, the literature about EIA in Rwanda discussed in this chapter helped the researcher to discuss the findings of this study.

CHAPTER THREE: STUDY AREA AND METHODOLOGY

3.1 Introduction

This chapter provides the background of the study area, data collection strategy, research design and methods, analysis of the data and limitations of the study. The background of the study area includes geographical location, demographic indicators and territorial surface of Rwanda. It also encompasses economic, social and environmental features of Rwanda. The research design and methods illustrates the construction and administration of questionnaire as well as sampling techniques, while the data collection strategy includes the quantitative research method for primary data and desktop approach methodology for secondary data.

3.2 Background to the study area

According to REMA (2009) and National Institute of Statistics of Rwanda (NISR, 2008), the Republic of Rwanda is a small country with 26,338 km² and its population as at 2006 was 9,058,592. In addition, NISR (2008) reveals that the population density of Rwanda to be 344 inhabitants per square kilometer and the population of 15 to 64 years old represents the highest percentage of the total population (55.2%). Furthermore, NISR (2008) declares that Kigali is the capital city of Rwanda and the official languages are Kinyarwanda, English and French.

According to Esty *et al.* (2008), based on the Environment Performance Index (EPI), Rwanda's global ranking on environmental performance in 2008 stood at 131 in a performance league of 149 countries. The country's EPI score of 54.9 was below the average for its income group (61.3) and also below that of the geographic group (57.9). Uganda (61.6), Tanzania (63.9) and Kenya (69.0) performed relatively better than Rwanda.

The Republic of Rwanda is a land-locked country located in central Africa and the geographical location of Rwanda is 1° 57' S, 30° 4' E (Central Intelligence Agency,

2010). The administrative map of Rwanda below shows four provinces (Eastern, Western, Northern and Southern) and Kigali city in the center.

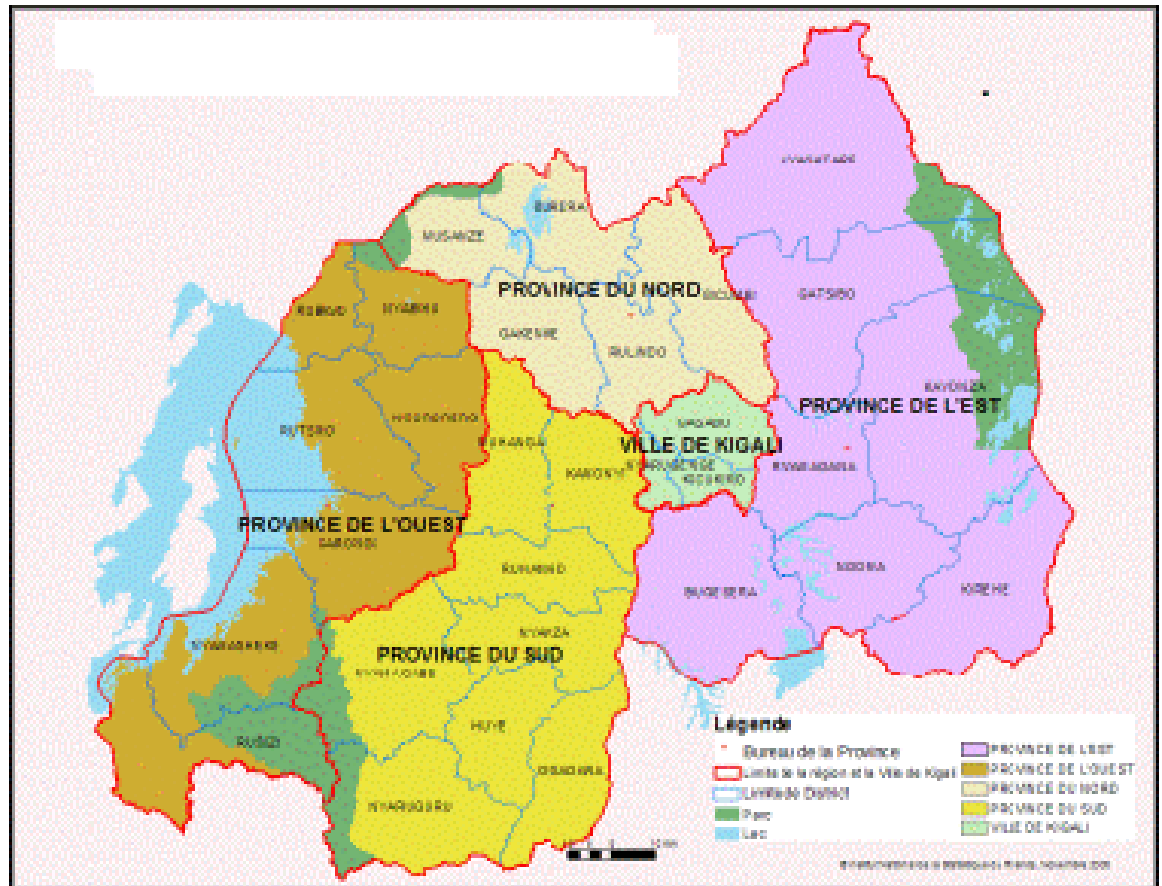


Figure 3.1: Administrative map of Rwanda (REMA, 2009: 1)

In the bid to portray economic features of Rwanda, NISR (2008) estimated the Gross Domestic Product (GDP) of 2006 at 1,583 billion Rwandan francs (Frw) or US\$ 2.8 billion with GDP per capita of 175,000 Frw or US\$ 314, at the nominal exchange rate of 558 Frw for US\$1. The agriculture sector is the highest contributing sector to GDP at 41% (NISR, 2007). However, being dependent on rain-fed agriculture, Rwanda's economy and people's livelihoods are vulnerable to climate variability and climate change (REMA, 2009).

The RDB shows that Rwanda has eight priority sectors which are development drivers of the country notably Information and Communication Technology (ICT), tourism, Energy, Agriculture, mining, financial services, infrastructure, real estate and construction (RDB, 2010). In the bid to show the extent of development in Rwanda, the current situation of those priority sectors are discussed below.

RDB (2010) reveals that ICT as one of the crosscutting issues of Rwanda vision 2020 target, it attracted US\$500 million in investment over the last three years by both private and public sector and the government has invested in a 2,500 km optic fibre that covers Kigali city and the entire country with a total of seven regional links to the neighbouring countries and Kigali City wireless broadband. In addition, MTN Rwanda and Rwandatel are the leading players offering fixed telephones, mobile telephones, and internet services. TIGO, the third telecommunication operator, only began operation by end of 2009 (RDB, 2010).

Secondly, RDB (2010) shows that the tourism industry is the country's largest foreign exchange earner since leisure tourists spent US\$209 million in 2007 and it increased by 50% in 2008. Furthermore, Rwanda has five unique and attractive natural assets including the Virunga National Park with a natural habitat for 600 of the 800 rare mountain gorillas; the rainforests of Nyungwe National Park which is a home to rare chimpanzees, birds and elephants; Lake Kivu surrounded by stunning beaches and dormant volcanoes covered by lush vegetation; Akagera National Park which is offering the potential to be one of East Africa's great safari destinations and Rwanda has over 1/3 of Africa's bird species (RDB, 2010). However, RDB (2010) asserts that there are only 187 hotels and 4,102 hotel rooms in Rwanda of which only seven are upper range.

The energy sector in Rwanda is not large. Thus, RDB (2010) asserts that it provides 60-69 Mega Watts of electricity generation (50% of hydro-electric and 50% of diesel). In addition, 50-55 billion m³ of methane gas in lake Kivu will enable the Kivu watt power plant which is under construction to produce an extra 100 Mega Watts (RDB, 2010).

Agriculture is the cornerstone of the economy in Rwanda and RDB (2010) shows that around 87% of the population is engaged in agricultural activities. The main agricultural exports are coffee, tea and others like dairy, fruits, fresh cut flowers, and silk and food crops for export to the region (RDB, 2010).

The mining sector in Rwanda is not huge but it is one of the highest contributing sectors to the country's economy. Rwanda's main mineral exports are ores processed to extract tin, coltan and tungsten. However, RDB submits that only 25% of US\$ 200 million potential output is currently exploited but diversification opportunities in quarries (for construction materials) and precious stones (gold, diamond, beryl, topaz, rubies, sapphires, garnets and other unexploited deposits) have been identified (RDB, 2010).

The banking sector is comprised of eight commercial banks, one primary microfinance bank, one discount house, one development bank and one mortgage bank. In addition, RDB confirms that an estimated 12% of the population had a bank account in 2007 (RDB, 2010).

The infrastructure sector comprises over 14,000 km (8,700 miles) of roads, 20% of which is paved and the Kigali International Airport with an annual capacity of 4.4 million passengers (RDB, 2010). However, there are no railroad systems available, but the new two branches of the railway line are in the pipeline. This will connect Isaka (Tanzania) and Kigali to link to the Port of Dar Es Salaam Rwanda-Burundi via the Democratic Republic of Congo (RDB, 2010).

Lastly, real estate and construction is the booming sectors in Rwanda. For instance, RDB (2010) shows that from 2003 to 2008, investment in the construction sector grew from US\$ 100 million to US\$ 350 million. Therefore, in 2008, revenues from the general construction sector increased by 51% because of population growth of 2.8% combined with urban growth currently at 4% per annum and refugees returning to Rwanda (RDB, 2010).

The extent of development in Rwanda is also shown in table 3.1 from the country report on achieving the Millennium Development Goals (MDGs) in Rwanda.

Table 3.1: Progress against Rwanda vision 2020 targets and Millennium Development Goals (NISR, 2007: 10)

MDG	VISION 2020 AND MDG INDICATORS	2000 Baseline	TARGETS		LATEST VALUE (Year)
			V2020	MDG 2015	
MDG 1: Eradicate extreme poverty and hunger	Poverty (% below national poverty line)	60.4	30	30.2	56.9 (2006) OffTrack
	Child malnutrition (% of under-5s underweight)	24	10	14.5	22.5 (2006)
	Proportion (%) of the population below minimum level of dietary energy consumption	41.3		20.7	36. (2006)
MDG 2 Achieve universal primary education	Literacy level (% of 15 - 24 year olds)	74	100	100	76.8 (2006)
	Primary school net enrolment (%)	72	100	100	95 (2006)
	Primary school completion rate (%)	22	100	100	51.7 (2006)
MDG 3 Promote gender equality	Gender gap in primary education (%)	0.0	0	0	0 (2005)
	Gender gap in literacy (%)	10.0	0	0	0.1 (2005)
	Seats held by females in parliament (% of seats)		50	50	48.8 (2006)
MDG 4 Reduce child mortality	Children immunised against measles (% of 11-23 month-old)		100	100	84 (2005)
	Under 5 mortality rate (per 1,000 births)	196	50	50	152 (2005) OffTrack
	Infant mortality rate (per 1,000 births)	107	50	28	86 (2005) OffTrack
MDG 5 Improve maternal health	Maternal mortality rate (per 100,000 births)	1,071	200	268	750 (2005)
	Births attended by skilled health personnel (% of births)		100		28 (2005) OffTrack
MDG 6 Combat AIDS, malaria and other diseases	HIV prevalence (%)	13.9 ^{d/}	5		2.2 (2004) OffTrack
	Modern contraception (condom use) prevalence (%) among 15 -24 year-olds	4			39 (2005) Not Enough Data
	Proportion of population aged 15-24 years with comprehensive correct knowledge of HIV/AIDs				51% (girls), 54% (boys) Not Enough Data
	Ratio of school attendance of orphans to school attendance of non-orphans				0.92 (2005)
	Proportion of population with advance HIV infection with access to ARVs				On Track
	Prevalence and death rates associated with malaria (%)	51	25		4.6% (2005)
	Proportion of children under 5 sleeping under insecticide-treated bednets				13% (2005)
	Prevalence and death rates associated with tuberculosis				6% (2004)
Proportion of tuberculosis cases detected and cured under directly-observed treatment short courses				On Track	

MDG	VISION 2020 AND MDG INDICATORS	2000 Baseline	TARGETS		LATEST VALUE (Year)
			V2020	MDG 2015	
MDG 7 Ensure environ- mental sustain- ability	Forested land as percentage of land area		30		20 (2006) On Track
	Ratio of Area Protected to Maintain Biological Diversity to Surface Area	20	100		Off Track
	Proportion of the Population with Sustainable Access to an Improved Water Source	64	100		64 (2006) Off Track
	Proportion of the Population with Access to Improved Sanitation				Off Track
MDG 8 Develop a global partnership for development	Proportion of ODA to basic social services (basic education, primary health care, nutrition, safe water and sanitation)				Not Enough Data
	Proportion of official bilateral HIPC debt cancelled				On Track
	Debt Service as a Percentage of Exports of Goods and Services				Not Enough Data
	Telephone Lines and Cellular Subscribers per 100 Population				Off Track
	Personal Computers in Use and Internet Users per 100 Population				Off Track

The above table 3.1 reflects the progress against Rwanda Vision 2020 targets and MDGs in percentages. Targets use 2000 data as base and projections based on compound growth over 2000-2005. In addition, the table above indicates whether progress is on track to realise the 2015 MDGs targets or not whereas not enough data means that it is too early to tell. However, there are some data which are not available at the moment.

3.3 Data collection strategy

There are many ways of gathering information directly from participants if such information cannot be obtained from observation and also research methods should be appropriate to the research questions. According to Jackson (2009), descriptive methods include observational, case study and survey methods. The survey method is explained as questioning individuals on a topic or topics and then describing their responses (Jackson, 2009). Thus, surveys can be administered by mail, over the phone, on the internet, or during personnel interviews and its advantage over other description methods is that it allows researchers to study a larger group of individuals more easily (Jackson, 2009).

The quantitative approach is characterised by careful and detailed planning prior to its initial application. Neuman (2003) reveals that quantitative methods deal with data that are principally numerical. In a similar manner, Jackson (1995) asserts that quantitative research seeks to quantify or reflect with numbers, observations about human behaviour. It emphasises the testing of hypotheses based on the sample of observations and a statistical analysis of the data. Furthermore, quantitative research is described as entailing the collection of numerical data, as exhibiting a view of the relationship between theory and research as deductive and predilection for a natural science approach and as having an objectivist conception of social reality (Bryman, 2008). Bouma and Rod (2004: 169) provide the main difference between qualitative and quantitative research methods.

One of the major differences between quantitative and qualitative research is that, once the basic decisions are made in quantitative research, there is little opportunity to alter them in the light of early findings. Once a questionnaire is designed and sent, it is out of the researcher's hands. Once an experiment is carried out, it is over. However, qualitative research allows more continuous reflection on the research in progress and more interaction with the participants in research, and there is usually more room for ongoing alteration as the research proceeds.

Burton (2000) states that a questionnaire survey is the most frequently used method of data collection. The quantitative approach to this study has been employed through a questionnaire survey. According to the aim of this research, the desktop research method was also used to study the current EIA procedures in Rwanda while quantitative research methods were used to collect data and assess the practices of EIA processes as well as the challenges faced by environmental officers in Rwanda.

3.4 Research design and methods

This section is an important part of methodology used in this research since it discusses the construction of the questionnaire, recruitment of study participants and administration of the questionnaire.

3.4.1 Construction of the instrument (questionnaire)

Questionnaire construction is one of the most delicate and critical research activities (Jackson and Furnham, 2000; Pallant, 2005). As Peterson (2000) states, a questionnaire is more than a haphazard list of questions and an effective questionnaire is carefully structured to provide valid and reliable information at a reasonable cost. This view is supported by Bryman (2008) who reveals that the aim of questionnaire is to obtain information that meets the requirements of the research project. Furthermore, May (2001) asserts that the quality of information obtained from a questionnaire is directly proportional to the quality of the questionnaire, which in turn is directly proportional to the quality of the question construction process.

Generally, most questions can be classified into two groups within a questionnaire. On one hand, the researcher may choose closed-end question which involves offering respondents a number of defined response choices and they are asked to mark their response using a tick, cross or circle (Pallant, 2005). On the other hand, a researcher cannot guess all the possible responses that respondents might make. It is therefore sometimes necessary to use open-ended questions. The advantage here is that respondents have the freedom to respond in their own way, not restricted to the choices provided by the researcher (David and Sutton, 2004). However, closed questions are advantageous when a substantial amount of information about a subject exists and the response options are relatively well known (Fouche, 1998). In addition, Bryman (2008) asserts that one of the advantages of using closed questions is that they can be pre-coded, thus turning the processing of data for computer analysis into a fairly and simple task. According to Pallant (2005), a combination of both closed and open-ended questions works best. This view is also supported by Bryman (2008) who stresses that open-ended and closed-ended questions should be considered as complements rather than substitutes for each other, thus many questionnaires contain both types of questions.

In this research, both categories of questions have been used to fulfil the requirements of the research, but the closed-end questions have been especially used as rating scales. According to Pallant (2005), a Likert-type scale which can range from strongly disagree

to strongly agree gives a researcher a wider range of possible scores, and increases the statistical analyses that are available to the researcher. Furthermore, Cox (1980) asserts that there is no single optional number of rating scale categories defined for all scaling situations, but good practice is a balanced plus an additional “no opinion” category. In a similar vein, Leigh and Martin (1987) portray that “no opinion” answers do not automatically reflect a lack of knowledge or an inability to answer the question, rather it mostly means that a study participant is attempting to avoid the effort or time required to formulate or think about an answer.

In this research, six rating scale categories have been used, ranging from, for instance, “strongly agree to strongly disagree” plus a “no opinion” category. Vertical format was chosen due to the nature of answers, but also to distinguish more adequately between questions and answers. To support the choice of this format, Bryman (2008) reveals that many researchers prefer a vertical format whenever possible, because, in some cases where either arrangement is feasible, confusion can arise when a horizontal one is employed. Another reason why vertical formats may be superior is that they are probably easier to code, especially when pre-codes appear on the questionnaire (Bryman, 2008). Since the main aim of this study was to assess the EIA procedure and challenges faced by environmental officers in Rwanda, the questions were designed to reflect the focus of this research. Therefore, the questionnaire is divided into four sections which reflect the objectives of this study. To summarise the process of questionnaire construction and illustrate the actual lay-out of the consent letter and the questionnaire, one example of each is given in Appendixes 2 and 3.

3.4.2 Recruitment of study participants (sampling)

The next step within this research design is determining the sample to be surveyed from a known sample frame. According to Fowler (2002), the sample represents a segment of a population that is selected for the investigation, and the sampling frame is a listing of all units in the population from which the sample will be selected. Generally, decisions on the actual sample size are affected by considerations of time and cost. Furthermore, Bryman (2008) asserts that in most of the cases, it is a compromise between constraints

of time and cost, the need for precision and variety, and further considerations for example non-response probability, later analysis, etc.

Bearing these considerations in mind, especially for this research, where time and monetary resources are limited, the sample of this research was all eight (8) environmental officers in Rwanda and all individual consultants and consultancy firms which have been approved by REMA to carry out EIA studies in Rwanda. Therefore, the size of sample of eight (8) environmental officers was all of the available number of environmental officers who deal with EIA in Rwanda. The sample of consultants was also all consultant companies which have been approved by REMA and who have done at least one EIA study in Rwanda. However, according to EIA experts list of REMA (2009), the targeted international and local individuals and consultancy firms were 24 but REMA reports reveal that only 19 of them have at least done an EIA study in Rwanda while the other five (5) had not yet undertaken any EIA study in Rwanda. Thus, the actual sample size of EIA consultants was 19 individuals and consultancy firms. The list of EIA consultants approved by REMA is given in Appendix 3. In total, 27 interviews (8 EIA officers and 19 consultants) were approached to complete the questionnaire. Thus, a saturation sampling approach was undertaken because, given the low number of the target population (8 environmental officers and 19 EIA consultants), it was imperative that all potential respondents be approached to ensure that the data is statistically significant and representative.

3.4.3 Administration of the questionnaire

Bryman (2008) states that survey research mainly uses self-completion questionnaires and/or structured interviews as research instruments. A self-completion questionnaire is sometimes referred to as a self-administered questionnaire. According to Bryman (2008), with a self-administered questionnaire, respondents answer questions by completing the questionnaire themselves. Within the existing literature on social research several advantages and disadvantages of the self-completion questionnaire over the structured interview are mentioned. Advantages encompass the fact that questionnaires are cheaper to administer and are less time-consuming than interviews while disadvantages are

greater risk of missing data and lower response rates (Bryman, 2008; Fowler, 2002). However, there are some features that may increase the response rate effectively including writing a good covering letter explaining the reasons for the research, why it is important and why the recipient has been selected and also clear instructions about how to respond (Bryman, 2008). Furthermore, follow-up procedures can be used, for example, sending reminders to study participants and phoning, if necessary (Fowler, 2002). Moreover, the figure below presents several different ways of administering the self-administered questionnaire and structured interview.

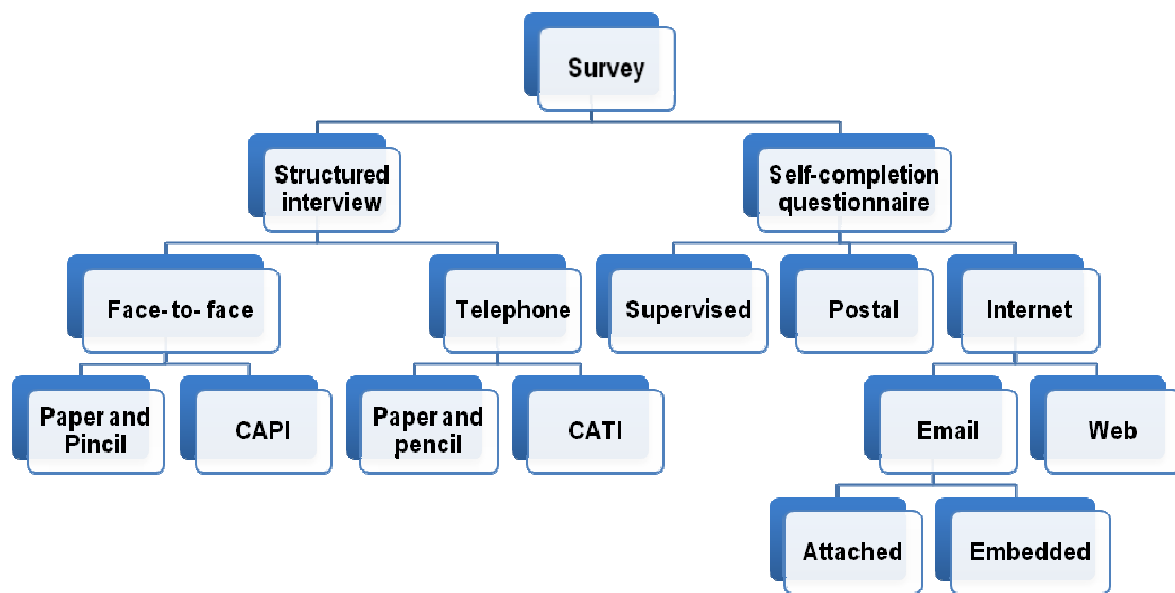


Figure 3.2: Main modes of administration of a survey (Bryman, 2008: 167)

In the above figure showing different ways of survey administration, CAPI stand for Computer Assisted Personnel Interview while CATI stand for Computer Assisted Telephone Interview. According to Bryman (2008), the difference between surveys administered by email and surveys administered via the web is that in the case of email surveys, the questionnaire is sent via email to the respondent and it is mainly employed in relation to smaller, more homogeneous on-line user groups while with a web survey, the respondent is directed to a website in order to answer the questionnaire and also web surveys have been used to study larger groups of online users. In this research, all

questionnaires were sent to respondents by attached email and they were asked to send back completed questionnaires also by attached email.

In case of the embedded questionnaire, the questions are found in the body of the email while with attached questionnaires, the questionnaire arrives as an attachment to an email that introduces it (Fowler, 2002). According to Bryman (2008), the advantage of an attached questionnaire is that to return the questionnaire, respondents have the opportunity to fax or send the completed questionnaire by postal mail to the researcher. However, the critiques of attached questionnaires indicate the risk of getting viruses from infected attachments and it is not easy to read the attached document if the respondent is not familiar with computer or if his or her computer does not provide the appropriate software to open it (Bryman, 2008).

To achieve the aim of a high response rate for this survey, emails were sent to potential study participants (environmental officers and EIA consultants), not only to confirm their email addresses but also to ask them for their consent to fill-in a questionnaire, before actually sending the questionnaires. Additionally, a personalised covering email was sent with the questionnaire to explain the research project briefly and the importance of a high response rate. Lastly, all of the potential participants of this study are familiar with using the internet and Microsoft word to download the attached questionnaire. As a result, the achieved response rate was 74% (20 responses out of 27 questionnaires). Specifically, the environmental officers' response rate was 100% while EIA consultants' response rate was 63% (12 responses out of 19 questionnaires).

3.5 Analysis of the data

It is meaningless to gather sufficient data if the researcher does not manage to make meaning of them through analysis and interpretation and thereby explain his/her understanding of design logic (Henning, 2004). The aim of data analysis therefore is to make order and structure of the data, and to interpret them fully. Different authors show that one of the most common approaches to data analysis is thematic analysis (Bryman, 2008; Fowler, 2002). Furthermore, Bryman (2008) reveals that the themes and subthemes

are the product of a through reading and rereading of the transcripts or field notes that make up the data.

According to Bryman (2008), there are three main methods of analysing quantitative data, notably methods for analysing single variables at a time (univariate analysis), methods for analysing relationships between two variables (bivariate analysis), and the analysis of relationships between three variables (multivariate analysis). In addition, the same author asserts that univariate analysis encompasses different approaches including frequency tables, diagrams, measures of central tendency (average for distribution) and measures of dispersion (typical value of a distribution). Frequency tables provide the number of people and the percentages belonging to each of the categories for the variable in question and its advantage is that it can be used in relation to all the different types of variables (Bryman, 2008). The same author also reveals that diagrams are the most frequently used methods of displaying quantitative data and their chief advantage is that they are relatively easy to interpret and understand. However, Bryman (2008) portrays that bar charts and pie charts are two of the easiest methods to use when working with nominal and ordinal variables while if displaying an interval variable, a histogram is likely to be employed.

In this research, the data collected from the questionnaires was captured into the SPSS template after being coded. The SPSS system facilitated the researcher to generate frequency tables and diagrams that helped the researcher to analyse the data thematically in relation to the key questions of this study.

3.6 Limitations of the study

When carrying out a study, it is important that the researcher acknowledges possible limitations faced but these potential limitations should not mean that useful information was not elicited from participants and therefore these limitations should not negate the findings of this study. During this study, the researcher encountered the following challenges and limitations: potential participants, especially EIA consultants, did not respond to their questionnaires timeously; construction and administration of

questionnaires were costly and time-consuming; and few respondents were confused about how to respond to some questions. To solve these problems encountered, as suggested by Bryman (2008) and Fowler (2002), a good covering letter explaining the reasons for the research, clear instructions about how to respond and follow-up procedures, for example, sending reminder emails to study participants were used.

3.7 Conclusion

To achieve the aim of this study, it required using the appropriate methods of collecting and analysing data. In addition, the geographical location, development drivers and the extent of the development in Rwanda presented in this chapter show that even if Rwanda is a poor country, it offers a conducive environment for investment. According to the study area conditions and the scope of this research, this chapter shows that data collection strategy, questionnaire construction method, sampling method and the mode of administration of a survey used in this study were appropriate to this kind of research. Furthermore, frequency and crosstabulation tables generated by SPSS are used in this study (next chapter) to facilitate the researcher to analyse data collected thematically.

CHAPTER FOUR: DATA ANALYSIS

4.1 Introduction

The aim of this chapter is to present and describe the questionnaire survey results. After analysing the primary collected data, the results of this study are also discussed in this chapter. According to the objectives of this research, the results are presented in four sections, notably, respondents' background, profile and experience, effectiveness of EIA processes in Rwanda and challenges faced by environmental officers. The results are shown in frequencies and percentages which are presented in tables and figures. Furthermore, the discussion of questionnaire survey results is based on a critical analysis of obtained results and its comparison with other EIA findings of different authors and researchers from different countries.

4.2 Respondents' background

This section shows the job titles and institutions of the respondents. In addition, it shows the role and responsibility of respondents in the EIA process in Rwanda. In other words, the importance of this section is to assess whether the researcher has targeted all EIA practitioners in Rwanda to achieve the main aim of this study.

4.2.1 Institution and job title of respondents

Table 4.1: Institution of respondents

	Frequency	Percent
Rwanda Development Board (RDB)	5	25
Rwanda Environment Management Authority (REMA)	3	15
Consultancy Firms	12	60
Total	20	100

The above table illustrates that consultants constitutes a large portion of the total number of respondents with 60% whereas respondents from RDB make up a total of 25% and respondents from REMA 15%. This is due to the fact that the main EIA administrative

body in Rwanda was REMA before RDB became the EIA administrative body as discussed in chapter two. The results do not mean that EIA is administered by two different government bodies in Rwanda but after transfer of EIA responsibilities to RDB, three EIA officers remained in REMA. Therefore, it is imperative to include these three staff from REMA in this research as EIA practitioners since they have considerable experience in EIA.

As shown by different authors in chapter two, EIA administration varies from one country to another but in most cases it is a department within the Ministry of Environment or a specialised government institution like NEPA in the USA (Glasson *et al.*, 2005), CEAA in Canada (Fitzpatrick and Sinclair, 2009), SEPA in China (Wang *et al.*, 2003) and NEMA in Uganda and Kenya (ECA, 2005), whereas countries which have the Directorate of the Environment in the Ministry of Environment as the main administrative body of EIA are Algeria, Niger, Cameroon, Congo, Gabon and Burundi (ECA, 2005). According to the literature review, Rwanda is a unique country which has an EIA administrative body which has different responsibilities which are not necessarily related to environmental issues since RDB was established as a specialised organ in charge of fast tracking development activities as shown in the introductory chapter. This includes key agencies responsible for business registration, investment promotion, environmental clearances, privatisation and specialist agencies which support the priority sectors of ICT and tourism as well as human capacity development in the private sector. Therefore, the advantage of this is not only to reduce tensions between business facilitators and environmental regulators in government institutions, but also it facilitates investors to have a quick and good service at the same time in both departments which report to the same government institution like the RDB. However, Opoku (2001) reveals that in most developing countries their top priority is development rather than environmental protection which is also exacerbated by corruption. In this case, having a department in charge of promoting local and foreign direct investments and an EIA department in the same institution cannot be a good idea because investment and business departments have a tendency of influencing the EIA department.

Table 4.2: Job title of respondents

	Frequency	Percent
EIA officer	8	40
Consultant	12	60
Total	20	100

According to the job title of respondents, the above table shows that the respondents are in two categories, notably, EIA officers with 40% and consultants with 60% of the total number of the respondents. These figures are expected since the literature reveals that in Rwanda, the approved list indicates twenty four (24) international and local consultancy firms and individual consultants but REMA reports reveal that only 19 of them have at least done any EIA study in Rwanda. Furthermore, as shown in the literature review, eight (8) environmental officers is the total number of available EIA officers in Rwanda. Thus, 63% of consultants participated in the study and all the environmental officers.

4.2.2 Job responsibilities of respondents

Table 4.3: Responsibilities of respondents (multiple responses) (n=20)

	EIA officers		Consultant	
	Frequency	Percent	Frequency	Percent
Site visits	8	100	1	8.3
EIA review of reports	8	100	0	0
Audit of project after implementation	8	100	0	0
Screening project brief	8	100	0	0
Participation in public hearings	5	62.5	1	8.3
Development of terms of reference of EIA study	8	100	0	0
Preparation of document for bidding	0	0	1	8.3
Undertake EIA studies	1	12.5	11	91.7
Establishing contacts with all stakeholders	1	12.5	0	0
Preparation of EIA report	1	12.5	2	16.7
Follow-up with institution in charge of EIA review	1	12.5	2	16.7
Overall coordination of company activities	0	0	2	16.7
Represent company on official duties	0	0	2	16.7

The above table depicts the crosstabulation of job responsibilities and job titles of respondents. The crosstabulation clearly indicates the number and percentage of respondents who pursue each job responsibility, according to their job title. This is important because job responsibility alone does not provide a clear indication about responsibilities of EIA officers and consultants. All EIA officers (100%) undertake site visits, screen project briefs, develop ToR of EIA studies, review EIA reports and audit projects after implementation while only one of the consultants (8.3%) undertakes site visits. This underscores the argument, as highlighted in Morrison-Saunders and Bailey (2009), that the role of EIA regulator is to implement EIA policy and procedures in accordance with the legislative framework. In addition, the role and responsibilities of

EIA officers provided in REMA (2006) and discussed in chapter two also confirm these results. The majority of EIA officers (62.5%) participate in public hearings while only 8.3% of consultants do. This responsibility also was expected since different authors assert that public participation is a cornerstone of the EIA process (Glasson *et al.*, 2005; Wood and Hartley, 2005). However, the level of participation in public hearings of consultants is not sufficient. A large portion of the total number of consultants (91.7%) undertakes EIA studies while EIA officers make up only 12.5%. This emerges as one of the main responsibility of consultants, as portrayed by Morrison-Saunders and Bailey (2009) that consultants are employed by proponents to assist in dealing with the administrative aspects of EIA and to undertake the technical work necessary to assess and mitigate the potential impacts of the proposal like baseline studies, EIS preparation, response to public submissions, etc. On the other hand, bearing in mind the responsibilities of an EIA consultant as stipulated by Morrison-Saunders and Bailey (2009), it is clear that undertaking EIA studies is not one of the job responsibilities of an EIA officer since he or she cannot undertake the EIA studies while he also has to review EIA documents.

Only two of consultants (16.7 %) have the responsibilities of overall coordination of company activities and represent their companies on official duties while 8.3% of consultants are in charge of preparation of documents for bidding. As some of consultants who responded belong to international and local consultancy firms, it is obvious that some of them pursue those routine duties in their companies like coordination as well as preparing the documents for bidding in order to be hired by different developers. It is also in a similar manner that two consultants (16.7%) identified preparation of EIA reports and follow-up with institutions in charge of the EIA review as their job responsibility. Only one EIA officer (8.3%) responded that preparation of EIA reports and follow-up with institutions in charge of EIA review are among his job responsibility. This response is confusing since he or she is an EIA reviewer. It is also imperative to mention that an EIA officer cannot do a follow-up with institutions in charge of the EIA review while he or she is one of the staff of that institution.

Finally, one of EIA officers (8.3%) has to establish contacts with all stakeholders. This responsibility is also one of the crucial duties of EIA officers as portrayed in Morrison-Saunders and Bailey (2009), that a successful EIA review depends upon the cooperation and coordination of all EIA stakeholders.

4.3 Respondents' profile and skill level

To analyse and discuss the profile and skill level of the respondents, this section presents the findings concerning the following points: education level of respondents, relationship between level of education and respondents' current jobs, number and kind of professional training sessions attended by respondents as well as their relationship with EIA. In addition, the results concerning experience of respondents are discussed in this section.

4.3.1 The level of education of EIA practitioners in Rwanda.

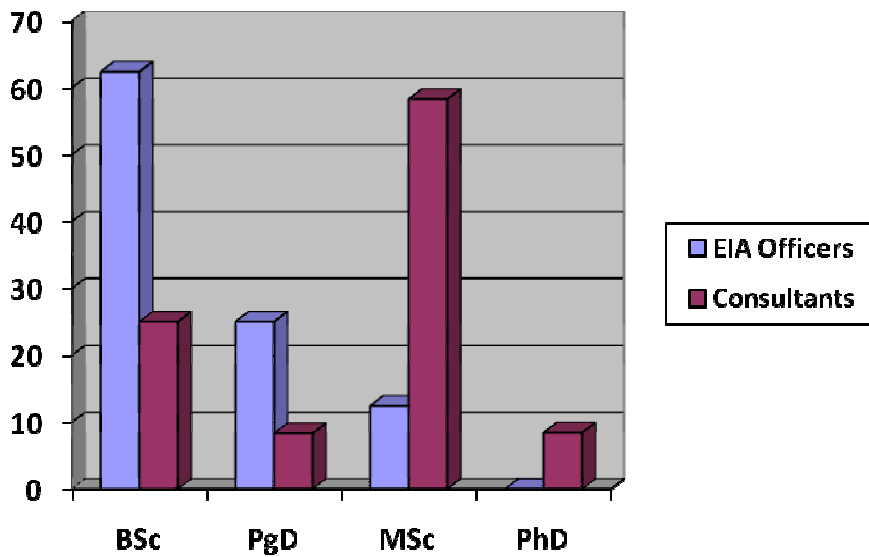


Figure 4.1: Level of education of respondents (in %, n=20)

Figure 4.1 above shows the comparison of the level of education of EIA officers and EIA consultants who participated in this research. This figure reflects that the majority

(62.5%) of EIA officers possesses a Bachelor's degree (BSc), 25% have a Postgraduate diploma (PgD) and only one EIA officer (12.5%) has a Master's degree (MSc). These figures were expected since the job requirement shown in chapter two state that environmental officers qualification requirement in Rwanda is a BSc in environmental sciences, ecology, biology, chemistry, rural engineering or civil engineering (REMA, 2006). Furthermore, the level of education of EIA officers in Rwanda is almost the same as the level of education of EIA officers in Mozambique where six of the eight EIA officers hold a BSc, mostly in biology (Hatton *et al.*, 2003). However, having an EIA department which is mostly staffed by scientists only has a negative effect on EIA effectiveness as submitted by Holm-Hansen (1997) who states that the problem of EIA which is staffed by natural scientists is that EIA focuses on effects instead of impacts and focuses on ecology rather than the environment in its entirety. The above figure also depicts that 58.3% of the consultants who participated in this research hold a MSc, 25% have a BSc, one of consultants (8.3%) has a PgD and lastly, only one consultant has a Doctor of Philosophy (PhD). Therefore, these results clearly show that EIA consultants who participated in this research are more educated than EIA officers in Rwanda. This was also expected since Morrison-Saunders and Bailey (2009) show that most of the government EIA departments are under-resourced and the highly educated EIA professionals prefer to work as consultants in order to earn more money. This view is also supported by Spong *et al.* (2003) that the reason of the high turnover of highly educated EIA officers is poor remuneration in the public service. Nevertheless, this level of education gap between EIA officers and consultants also has a negative impact on the effectiveness of EIA as shown by Morrison-Saunders and Bailey (2009) that when EIA officers are less educated than consultants, they have a tendency to rely on written communication and document review rather than face-to-face meetings with consultants to resolve issues. In other words, the two groups of EIA practitioners must have at least the same background, training and education in order to effectively manage the EIA process.

4.3.2 The relationship between domain of studies of EIA practitioners and their current job

Table 4.4: Respondent's perception of relationship between domain of their studies and current job

	EIA officers		Consultants	
	Frequency	Percent	Frequency	Percent
Strongly related	4	50	7	58.3
Related	4	50	5	41.7
Total	8	100	12	100

Table 4.4 illustrates that half (50%) of EIA officers believe that their current job is strongly related to their domain of studies and also four of them state that their job is related to their domain of studies whereas the domain of studies of seven consultants (58.3%) strongly related to their job. The International Association for Impact Assessment (IAIA) Guidelines for a lead Impact Assessment (IA) practitioner and a lead IA administrator reveals that an EIA practitioner at least should have been awarded a degree from an accredited university in one of the following domain of studies: environmental studies, geography, ecology, biology, sociology, social anthropology, planning, engineering and landscape architecture (IAIA, 2006). As shown above by REMA (2006), the required domains of studies for an EIA officer in Rwanda are quite different from IAIA guidelines because REMA does not include sociology, social anthropology and planning as one of requirements of the domain of studies for an EIA officer. Consequently, the results of this study show that the domain of studies of EIA officers is related and among others it is strongly related to their job requirement. However, it is important to note that there are no social scientists among the EIA officers in Rwanda. This has been also found in France where all EIA officers are engineers and natural scientists (Glasson and Bellanger, 2003). This has a negative impact not only on the effectiveness of EIA processes as indicated earlier by Holm-Hansen (1997), but also it has an adverse impact on the implementation of Social Impact Assessment (SIA). Vanclay (2003) asserts that social scientists can help in the process of SIA which includes

the process of analysing, monitoring and managing the intended and unintended social consequences of planned projects and any social change processes invoked by those interventions (projects).

4.3.3 Professional training attended by respondents

Table 4.5: Number of professional training attended by respondents

	EIA officers		Consultants	
	Frequency	Percent	Frequency	Percent
None	0	0	1	8.3
1 - 5	5	62.5	4	33.3
6 - 10	2	25	3	25
11 - 15	1	12.5	1	8.4
16	0	0	3	25
Total	8	100	12	100

Table 4.5 depicts the crosstabulation of the number of professional training sessions attended and job description in order to enable the researcher to compare the number of training sessions attended by EIA officers and consultants. The highest number of EIA officers (62.5%) attended one to five professional training sessions whereas only 33.3% of the consultants attended this number of professional training sessions. The results of this research also show that 8.3% of consultants have not yet attended any professional training. On the other hand, it shows also that the highest number of people who attended sixteen and above professional training sessions were consultants.

Furthermore, the above table 4.5 clearly reflects the comparison of the number of training sessions attended by both EIA officers and consultants. It shows that consultants are on two extremes including people who did not attend any course and people who attended the highest number of training sessions (16 and over) whereas the number of EIA officers decreases as the number of training sessions attended increases. This means that consultants are more trained than EIA officers. These results were expected since the more trained EIA officers quit and join consultancies because of poor remuneration of the

government institutions as discussed earlier. In addition, the poor training plan of EIA officers also is caused by different factors including shortage of staff in the EIA department, pressure of investors and community, and limited and mismanagement of financial resources in government institutions from poor countries (Chapman and Walmsley, 2003). These factors can influence not only the EIA department not to provide an adequate capacity-building plan for their staff but also a high turnover of well trained staff (ECA, 2005; Chapman and Walmsley, 2003).

Table 4.6: Type of training attended by respondents (multiple responses)

	EIA officers		Consultants	
	Frequency	Percent	Frequency	Percent
Environmental management	3	37.5	6	50
Solid waste management	1	12.5	3	25
project management	1	12.5	1	8.3
Environmental impact assessment procedure	4	50	3	25
Inventory of chemical products	2	25	0	0
Risk assessment of chemicals management	1	12.5	0	0
Presentation of a scoping study on the status of integrated water resources management in Rwanda	0	0	1	8.3
Environmental, social and economic impact assessment and restoration of watersheds	0	0	1	8.3
Groundwater investigation, exploration and model application	0	0	1	8.3
Cleaner production	1	12.5	1	8.3
Monitoring and Evaluation	1	12.5	0	0
Wetland management	4	50	2	16.7
Cultural heritage in EIA	1	12.5	0	0
Land-use planning	1	12.5	0	0
SEA	2	25	3	25
Climate change	1	12.5	1	8.3
Water resource management	1	12.5	2	16.7
Environmental governance	0	0	1	8.3
Biodiversity	1	12.5	1	8.3

EIA and international guidelines	0	0	1	8.3
Environmental audit	2	25	1	8.3
Education for sustainable development in a river basin context	1	12.5	0	0
State of Environment	1	12.5	0	0

Table 4.6 shows different types of training sessions attended by EIA officers and consultants in detail. A good number of EIA officers (50%) have been trained in EIA procedures and wetland management whereas the highest number of consultants (50%) confirmed that they are trained in environmental management. Furthermore, the above table reflects that the rest of training sessions have been attended by a small number (one or two) of EIA officers or consultants. These training sessions are grouped in four categories: environmental quality monitoring (presentation of a scoping study on the status of integrated water resources management in Rwanda, groundwater investigation, exploration and model application, monitoring and evaluation, water resource management, environmental governance, climate change and biodiversity); environmental protection (solid waste management, inventory of chemical products, risk assessment of chemicals management and land-use planning); environmental assessment (environmental, social and economic impact assessment and restoration of watersheds, cultural heritage in EIA, SEA, EIA and international guidelines, education for sustainable development in a river basin context and state of environment); and project management.

The Asian Development Bank (ADB, 2006) reveals that key training areas EIA officer should have are environmental management, environmental quality monitoring (water, air, land, soil, biodiversity, natural areas and built environment), environmental protection and mitigation measures (spatial planning, route, conservation, pollution prevention and control, waste management, reclamation of disturbed areas and remediation of contaminated sites), environmental assessment (EIA, SEA, cumulative effects environmental assessment, environmental clearance and environmental assessment compliance monitoring) and sectoral environmental management (urban development, power transmission and distribution, mining, forestry, industry and

tourism). However, the priority training areas vary from one country to another according to the main development drivers of each country. Therefore, as per responses most of training areas required in Rwanda are being covered but not all respondents have been trained in all of those required areas of training for an EIA practitioner. In addition, Wood (2003b) and Mahiber (2008) submit that both longer-term and specialised short courses need to be multidisciplinary and focused on the practical and operational aspects of EIA rather than on the theoretical aspects of EIA.

Table 4.7: Respondent's perception of relationship between training attended and EIA

	EIA officers		Consultants	
	Frequency	Percent	Frequency	Percent
Strongly related	6	75	8	66.7
Related	2	25	3	25
Not related	0	0	1	8.3
Total	8	100	12	100

Table 4.7 above portrays the relationship between training attended and EIA. The results show that the majority of EIA officers (75%) who attended training sessions indicated that they are strongly related with EIA and no one stated that the training was not related to EIA. Those results were expected since table 4.6 shows that most of training areas an EIA officer should have attended are covered. In contrast, the above table shows that one of the consultants (8.3%) who attended training sessions stated that they were not related to EIA. This was expected since table 4.3 shows that consultants have other responsibilities in their consultancy firms apart from EIA like preparation of bidding documents.

4.3.4. The skills gap of EIA practitioners in Rwanda

Table 4.8: Level of effectiveness with specific statements related to skills (in %, n=20)

	Strongly effective	effective	Neutral	Ineffective	Strongly ineffective	No option
Computer literacy (Microsoft office Word, Excel and power point)	90	10	-	-	-	-
Using GIS and remote sensing software	5	20	40	15	15	5
Language skills (English)	65	35	-	-	-	-
Public participation facilitation	35	55	10	-	-	-
Integration of technical and social concerns in the EIA report review	40	50	10	-	-	-
Impact prediction and assessment	55	25	20	-	-	-
Mitigation measures and alternative formulation	45	35	20	-	-	-
Ability to review documents	35	55	10	-	-	-
Monitoring and evaluation skills	25	60	10	-	5	-
Understanding project management	25	45	15	5	10	-
Customer care skills	10	60	25	-	5	-

As EIA practitioners need different skills to effectively manage EIA processes, table 4.8 reflects the level of effectiveness among respondents (EIA practitioners) according to their perceptions in relation to different skills in Rwanda. With reference to the job responsibilities of EIA practitioners presented in table 4.3, Microsoft office word, excel and power point are the most used software in the routine works of EIA officers like writing of letters and reports and presentation of different tables, figures and slides. The results of this research show that almost all the EIA practitioners in Rwanda (90%) rated themselves as strongly effective in using these useful computer programmes. In contrast, the statement on using GIS and remote sensing software achieve a high rate of ineffective

(30%) and neutral (40%) responses. In other words, EIA practitioners in Rwanda need to strengthen their knowledge in using GIS and remote sensing since Antunes *et al.* (2001) stress that GIS and remote sensing can have a wide application in all EIA stages as the tools for collecting, storing, retrieving at will, transforming, and displaying spatial data for a particular set of purposes. Furthermore, GIS is considered as a form of modeling to represent or simulate the behaviour of the environment (Morris and Therivel, 2001).

The above table depicts that the majority of EIA practitioners (65%) in Rwanda rated themselves as strongly effective in using English which is the most used administrative language in the country. A good number of respondents (90%) show a high rate of effective public participation facilitation skills. This has a positive impact on the effectiveness of EIA as shown by different authors in chapter two that public participation is a cornerstone of the EIA process. In addition, public participation facilitation skills are very crucial for an EIA officer since public participation in EIA aims to establish a dialogue between the public and decision-makers and to ensure that decision-makers assimilate the public's views into their decisions (Glasson *et al.*, 2005).

The above results also show that a high proportion of EIA practitioners (90%) in Rwanda rated themselves as effective (50%) and strongly effective (40%) in integrating technical and social concerns in EIA. However, it is imperative to note that EIA practitioners in Rwanda are mostly scientists as discussed earlier even if they rated themselves as effective in integrating social concerns in EIA. It is extremely important for an EIA officer to have such skills of integrating social concerns as shown in the literature review that social, economic and biophysical impacts are interconnected and must be addressed concomitantly to achieve sustainable development (UNEP, 2004; Glasson *et al.*, 2005). Furthermore, another reason for an EIA officer to have such skills is that social impact assessment is trying to understand the current social environment and is used as a baseline for prediction and measurement (Aucamp, 2009).

As shown in chapter two, impact prediction and assessment, mitigation measures and alternative formulation, EIA report review and monitoring and evaluation are essential

EIA steps. Therefore, the above table 4.8 shows that the majority of EIA practitioners in Rwanda perceive that they have the skills to adequately handle these vital steps of EIA. Furthermore, the above table depicts that 70% of EIA professionals in Rwanda rated themselves as effective in understanding project management whereas only 15% rated themselves as ineffective. EIA practitioners should have an idea about project management since UNEP (2004) suggests that EIA should be integrated into the project life-cycle to ensure that environmental information is provided at the appropriate decision points and the correct time. In a similar vein, Aucamp (2009) asserts that project life cycle has different stages including planning, construction, operational and decommissioning stage and environmental management practices in each are different. Therefore, the knowledge of project management will help EIA practitioners to manage environmental issues according to each stage of the project life cycle.

Lastly, the above table reflects that only 5% of EIA practitioners rated themselves as strongly ineffective in customer care while 25% rated themselves as neutral. Customer care skills are important since Morrison-Saunders and Bailey (2009) assert that the way EIA regulators treat or communicate with developers and their consultants has a great influence on the effectiveness of EIA process. However, the same authors reveal that in some cases EIA officers avoid meeting with developers and their consultants because of different reasons such lack of experience and qualification (Morrison-Saunders and Bailey, 2009).

4.3.5 The experience of EIA practitioners in Rwanda

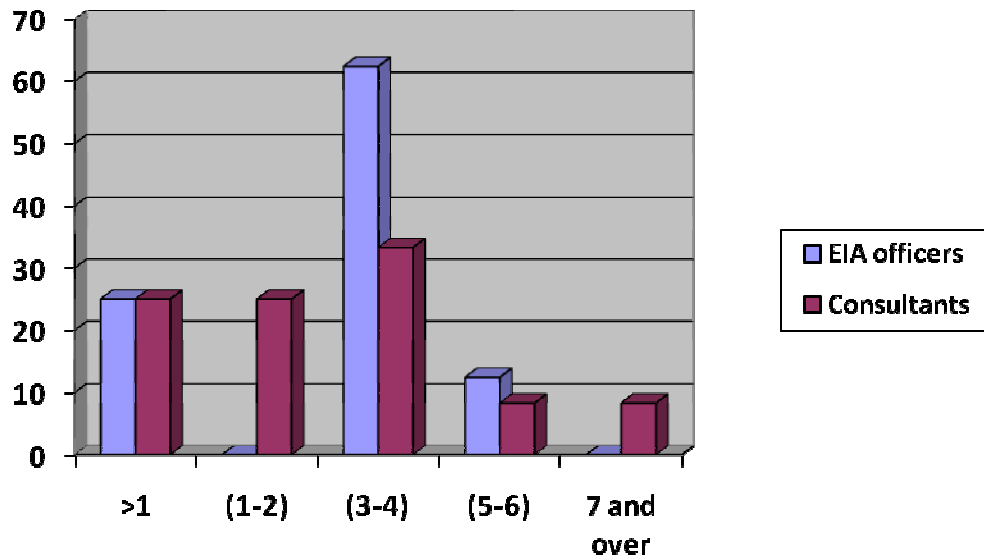


Figure 4.2: Level of experience in years of respondents (in %, n=8 for EIA officers and n=12% for EIA consultants)

Figure 4.2 reflects that the majority of EIA officers have between three and four years of experience in EIA and shows also that there is no EIA officer who has more than seven years experience. These results are obvious since REMA's annual report (2005) reveals that EIA started in 2005 with two EIA officers. Even if the above figure shows that only 8.3% of consultants have seven years and above of experience, it also shows, however, that EIA officers are more experienced than consultants in Rwanda since the average number of years of experience among the officers was calculated to be 3.1 years while the average number of years of experience for the consultants was 2.8 years. These results were not expected since Morrison-Saunders and Bailey (2009) assert that many consultants are more experienced than young officers within the government agencies. In addition, experienced EIA professionals prefer to work as consultants in order to earn higher salaries and not to stick to the routine work in the EIA department as EIA officers (Morrison-Saunders and Bailey, 2009). However, the level of experience of EIA officers in Rwanda are still low compared to the IAIA Guidelines for lead EIA professionals which states that an EIA practitioner is recognised as an EIA professional by IAIA if he

or she has at least ten years of progressive experience in EIA (IAIA, 2006). This low level of experience of EIA officers has an impact on the effectiveness of EIA process since Morrison-Saunders and Bailey (2009) believe that inexperienced younger EIA officers tend to follow the rule by the book all the time rather than necessarily thinking beyond the square.

4.4 Effectiveness of EIA process in Rwanda

There are many factors which can influence the effectiveness of the EIA process in Rwanda. Thus, to assess the effectiveness of EIA, this section presents the findings concerning the following points: relationship between developers and their consultants, developers' reasons for doing EIAs, EIA procedure and its implementation, the stage of the project where EIA is carried out and types of projects involved in EIA, the implementation of SEA in Rwanda, public participation in EIA processes in Rwanda, involvement of different stakeholders in EIA processes in Rwanda, EIA policy and other policies which impact on EIA processes in Rwanda, responsibilities of the Rwandan government in EIA processes. It is also imperative to note that it is not necessary to separate responses of EIA officers and consultants in the following tables since the following issues are generic.

4.4.1 The relationship between developers and their consultants

Table 4.9: Relationship between developers and their consultants (in %, n=20)

	Yes	No
Developers provide enough information and follow-up	30	70
Developers hire a consultant and wait for the decision without any follow-up.	50	50
Regular meeting with developers, consultant and authority	35	65
Developers do not know anything about EIA	40	60

A good communication and interaction between developers and their consultants also has an impact on the effectiveness of the EIA process (Nadeem and Hameed, 2008). The above table shows that the majority of respondents (70%) believe that in Rwanda developers do not provide enough information and follow-up to their consultants. This also confirms the second finding from the above table that 50% of respondents show that developers hire consultants and wait for the decision without any follow-up. The above results are considered as a challenge for the consultants in Rwanda since ECA (2005) reveals that the roles and responsibilities of developers in EIA processes is to supply all relevant information concerning the project to the consultant, to attend all workshops organised either by the consultant or authority, to review and approve all reports done by the consultants, conduct the internal review of all documents produced by the consultants and confirm time and payment condition for the consultants. Therefore, it is obvious that to pursue some of these responsibilities, developers should have an idea about the EIA processes. However, 40% of the respondents indicate that developers do not know anything about EIA. Glasson and Bellanger (2003) also support this finding by showing that since all EIA consultants are engineers and natural scientists in France, all developers regard EIA as only a scientific entity rather than a system. This has a negative impact not only on the effectiveness of EIA but also on the role of developers in their projects. The results of this study also show that a good number of respondents (65%) believe that there are no regular meetings between the relevant authority, developers and their consultants. This was also expected since earlier Morrison-Saunders and Bailey (2009) clearly show that when EIA officers are less experienced and educated than consultants, EIA officers avoid such meetings and prefer to communicate by writing letters. On the other hand, Aucamp (2009) stresses that regular meeting between the authority, developers and consultants are important for all parties because the authorities must be kept informed of any problems that arise during the process.

4.4.2 The reasons for doing EIA in Rwanda

Table 4.10: Why respondents feel that developers undertake EIAs (multiple responses)

	Frequency (n=20)	Percent
To fulfil the requirements of getting loans from local banks	19	95
To fulfil the requirements to be financed by international funds	12	60
To obtain land title and building authorisation from the district authority	20	100
To comply voluntarily with Environmental Organic Law	3	15

Table 4.10 reflects the respondents' perceptions about why developers undertake EIAs in Rwanda. All twenty respondents perceive that the main reasons for doing EIA is to obtain land title and building authorisation from the district authority. This result was expected since the literature shows that construction projects have the biggest number of the projects which are subjected to EIA in Rwanda. Furthermore, an EIA certificate is one of the requirements of getting an authorisation for building from the district. In addition, the above results show that developers undergo the EIA process to fulfill the requirements of getting a loan from local banks and being financed by international funds. However, only 15% of respondents feel that developers undergo an EIA process to comply voluntarily with Environmental Organic Law which determines the modalities of protection, conservation and promotion of the environment in Rwanda. This is also a problem of awareness about the EIA process among the developers. However, even if the reasons of doing EIA differ from one country to another, the above findings clearly show that the reasons for doing EIA in Rwanda reflect the main objective of doing EIA as a planning tool which helps to inform decision-making. For instance, to have an EIA certificate as one of the requirements to get a loan and building authorisation means that doing EIA helps banks and the district authority to make decisions regarding whether the loan or

building permit will be issued or not. In other words, most of the reasons are somehow related to the objectives and main reasons for doing EIA submitted by different authors in the literature review. Different authors submit that the main reasons for doing EIA are to inform the process of decision-making by identifying potentially significant environmental effects and risks of development proposals and to promote sustainable development (REMA, 2006).

4.4.3 EIA procedures and implementation in Rwanda

Table 4.11: Level of agreement with specific statements related to EIA procedures (in %, n=20)

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	No option
Most of the terms of Reference of EIA studies are prepared by the authority	80	10	5	-	5	-
Different specialists in different domains intervene in EIA studies	30	15	25	15	15	-
The process of EIA report review respect the time provided by the law (20 days)	5	5	40	-	45	5
Impact monitoring is often carried out after project approval	5	20	25	15	35	-
There are adequate appeal mechanisms	10	5	65	5	10	5
All steps of EIA provided by the law are respected	5	25	50	15	5	-
Environmental audit is regularly carried out by the authority	5	5	20	40	25	5

Table 4.11 shows that a high rate (80%) of the respondents strongly agreed that most of the ToR of EIA studies are prepared by the authority. This was expected since in the literature review it was shown that the EIA general guidelines of REMA and other

authors assert that ToR of EIA studies should be either prepared by developers and their consultants or by the authority. However, Cordura (2004) stresses that the ToR of EIA studies must be prepared by the developers or their consultants and submitted to the authority for approval before initiation of the EIA study. Similarly, Weaver (2003) indicates that the advantage of ToR prepared by developers themselves is that the scoping report comes up with the ToR of specialist studies to address key issues. In other words, the ToR should be outcome directed rather than instructive. This is not the case in Rwanda since the authority is the one which prepares the ToR and gives it to the developers and their consultants.

Indeed, this study shows that 30% of the respondents indicated disagreement while 25% were neutral in response to the statement that different specialists in different domains intervene in EIA studies in Rwanda. This is a weakness of the EIA process in Rwanda since UNEP (2004) asserts that the plan of EIA study is made up by different ToR for different specialists according to the issues identified. Therefore, the environmental impact report is also made up by the integration of all specialist studies. According to the above findings, it is different from what is happening in Rwanda.

Only 10% of the respondents agreed that the process of the EIA report review respects the time provided by the law (20 days). This has a great negative impact on the EIA process and this has been found also by different authors. For instance, Sandham *et al.* (2005) show that the slow pace of the EIA review in Limpopo is attributed to the shortage of staff in the EIA department, voluminous EIS and low level of experience among EIA officers. This has also supported by Nadeem and Hameed (2008) who indicate that the slow pace of the EIA review process in Pakistan has a negative impact not only on the effectiveness of the EIA process but also it delays the project to start which can cause some losses to the developers.

Half of the respondents disagreed that impact monitoring is often carried out after project approval and only 25% agreed with this statement. This also has a negative impact on the effectiveness of the EIA process in Rwanda as shown by Wood (2003a) and Dipper *et al.*

(2000) in the literature review that environmental impact monitoring is an essential part of the EIA process since it facilitates the identification of the anticipated impacts which help to rectify or address that change before it becomes uncontrollable. However, the above results were expected since different authors show that it is widely believed that monitoring and auditing are the weakest areas in the EIA process globally (Ahammed and Nixon, 2006; Dipper *et al.*, 2000).

The majority of respondents (65%) were neutral that there are adequate appeal mechanisms in Rwanda while 15% disagreed. This dilemma of being neutral can be attributed to different reasons including not being sure if the appeal mechanism is there or they are ignorant about this statement. However, even if in the literature review REMA (2006) shows that the appealing process is provided in the EIA procedure in Rwanda, the above results shows that it is not adequate or it is not even known. On the other hand, some countries including China (Wang *et al.*, 2003) and Cameroon (Alemagi *et al.*, 2007) do not provide an appeal mechanism in their EIA processes. This has a negative impact on the effectiveness of EIA process since Glasson *et al.* (2005) assert that even if the development is permitted people or organisations have the right to challenge the permission and appeal against that decision and if the development is refused, the developer can also appeal against the decision. To not provide adequate appeal mechanisms is not only a problem of the EIA process but also a problem of the violation of rights. The above table also shows that 50% of respondents are not sure whether steps of the EIA provided by law are respected or not and only 30% agreed with this statement. These findings were expected since they show that ToR are provided by the authority. This means that the step of scoping is absent or not carried out adequately.

Finally, only 10% of the respondents agree with the statement that the environmental audit is regularly carried out by the authority. This is a big challenge in relation to effectiveness of EIA in Rwanda since EIA audits is considered as the investigation of the accuracy of prediction made in the EIS (Ahammed and Nixon, 2006; Dipper *et al.*, 2000). These results are not surprising since it is shown above that the environmental audit is the weakest areas in the EIA process globally. On the other hand, Dipper *et al.* (1998) reveal

that the reasons for weak EIA audits processes can not only be regarded as a threat to and a criticism of the decision-making process but also it is due to the limited resources in many authority organisations.

4.4.4 The stage of the project where EIA is carried out

Table 4.12: Respondent's perception of the stage of the project where EIA is carried out

	Frequency	Percent
During the planning stage of the project	15	75
During the implementation stage of the project	5	25
Total	20	100

Table 4.12 reflects that fifteen of the respondents (75%) stated that EIA is initiated during the planning stage of the project in Rwanda whereas only 25% of respondents disagreed and indicated that EIA is carried out during the implementation stage of the project. The fact that the majority of respondents agreed that EIA starts during the planning stage of the project has a tremendous contribution to the effectiveness of EIA in Rwanda as shown by Glasson *et al.* (2005) that EIA is a systematic process that examines the environmental consequences of development actions, in advance. This is also supported by Wood (2003) who defines EIA as a means of evaluating the likely consequences of a proposed action which will significantly affect the environment, before that action is taken.

4.4.5 The types of projects subjected to EIA in Rwanda

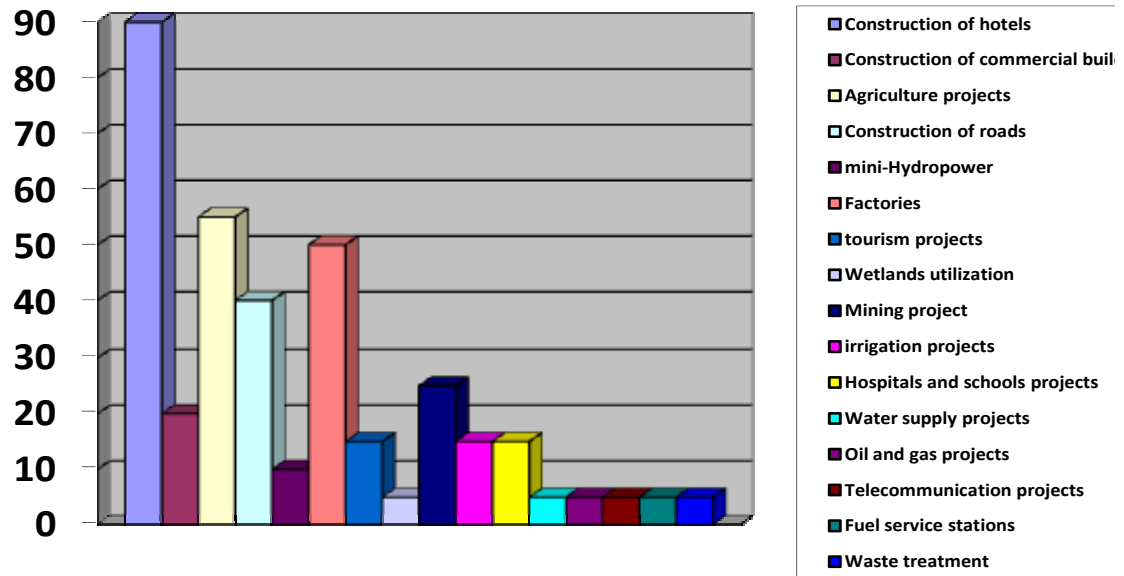


Figure 4.3: Type of projects in which respondent are involved in with EIA (in %)

Figure 4.6 shows different types of projects subjected to EIA in Rwanda. The majority of respondents (90%) submit that they are more involved in construction projects. This was expected since table 2.1 in the literature review shows that construction projects are the largest number of projects which have been subjected to EIA during the period of May 2005 and July 2008. Furthermore, table 4.11 depicts that all respondents believe that the main reason of doing EIA is to obtain land title and building authorisation from the district authority. The above figure also reflects a comparison of how different types of projects are subjected to EIA in Rwanda. It shows that projects related to water supply, oil and gas, telecommunication, fuel service stations, waste treatment and wetlands utilisation are the least projects subjected to EIA in Rwanda. Similarly, ECA (2005) shows that the review of the distribution by category of projects subjected to EIA in Uganda, Cameroon and Ghana revealed that waste management infrastructure is the lowest. However, these results are different from the projects subjected to EIA in developed countries as shown in the literature review. For instance, in the UK, Glasson and Salvador (2000) assert that main categories of projects have been waste disposal

(22%), roads (18%), industrial and urban (18%), extraction (14%) and energy (13%). From the above findings, it is clear that while waste disposal projects emerged as the main one to be subjected to EIA in UK, it is the least of types of projects subjected to EIA in Rwanda and other developing countries. Therefore, Glasson and Salvador (2000) attribute the reason of this to the different levels of environmental awareness in the two countries and to the cost of the waste treatment projects.

4.4.6 Strategic Environmental Assessment in Rwanda

Table 4.13: Respondent's perception of whether SEA is conducted

	Frequency	Percent
Yes	4	20
No	16	80
Total	20	100

Table 4.13 depicts that a significant portion of respondents (80%) indicated that SEA is not conducted in Rwanda. This result was expected since UNEP (2004) clearly states that in developing countries there are a small number of countries which have SEA processes in place. However, this has a negative impact on the effectiveness of EIA in Rwanda since SEA is of enormous importance not only on the EIA process itself but also on sustainable development as shown in chapter two.

Table 4.14: Importance of undertaking SEA, if is conducted (multiple responses)

	Frequency	Percent
None	16	80
Integrate environmental concerns in the national policies, plans and programmes	4	20
Total	20	100

This issue of importance of undertaking SEA was raised in relation to respondents who indicated that SEA is conducted. It is the reason why sixteen of the respondents (80%)

who felt that SEA is not conducted did not say anything about the importance of it. All respondents (20%) who indicated that SEA is conducted believed that the importance of SEA is to integrate environmental concerns in the national policies, plans and programmes. This shows that at least some of EIA practitioners in Rwanda have an idea about SEA since SEA is defined by different authors as a decision-making support instrument for the formulation of sustainable spatial and sector policies, plans and programmes, aiming to ensure an appropriate consideration of the environment (UNEP, 2004; Fischer, 2003). However, besides this importance portrayed by some of the respondents, Fischer (2003) shows the other importance of SEA, notably, to provide input on environmental and sustainability issues in planning or decision-making, to reduce the number and complexity of project EIAs, and to assess cumulative impacts and identify sustainability indicators.

Table 4.15: Reasons for not conducting SEA, if is not conducted (multiple responses) (n=20)

	Frequency	Percent
SEA is new	5	25
SEA will start very soon	1	5
Lack of capacity to conduct SEA	4	20
No importance is given to SEA	2	10
No specific guidelines of SEA available	6	30
None	3	15

The above table 4.15 shows different reasons for not conducting EIA in Rwanda identified by some of the respondents. The fact that there are no specific guidelines of SEA available emerged as the top reason for not conducting SEA in Rwanda since 30% of respondents believe this. However, other reasons mentioned by respondents including SEA is new, lack of capacity to conduct SEA, no importance is given to SEA and SEA will start soon are significant since they have been found by other authors in different countries as shown in chapter two. UNEP (2004) reveals that SEA is a recent tool in developing countries. In addition, Alshuwaikhat (2005) asserts that in some countries (Sri

lanka, Vietnam and Saudi Arabia) SEA was introduced with insufficient staffing, experience and monitoring with evaluation inadequacies and without enough baseline data. Furthermore, the same author stresses that many developing countries give lower priority to environmental assessment, especially at the policy level, in dealing with poverty alleviation, economic growth and development and, sometimes, political stability.

4.4.7 Public participation in the EIA process in Rwanda

Table 4.16: Respondents' perceptions if the public is involved in EIA processes

	Frequency	Percent
Yes	12	60
No	8	40
Total	20	100

Table 4.16 illustrates that the majority of respondents (60%) indicated that the public is involved in EIA processes in Rwanda. The fact that 40% of respondents disagreed with the statement means that even if the public is involved in EIA, it is not adequate like in some developing countries as shown in the literature review. This has a negative impact on the effectiveness of EIA since Glasson *et al.* (2005) assert that public participation in EIA aims to establish a dialogue between the public and decision-makers and to ensure that decision-makers assimilate the public's views into their decisions. However, the above findings are supported by different authors that public participation in EIA processes has different limitations, especially in developing countries, notably, limited democracy, cultural traditions, low levels of education and literacy and gender inequality (UNEP, 2004; Alshuwaikhat, 2005).

Table 4.17: Respondent's perceptions about the stages of EIA in which the public are involved (multiple responses)

	Frequency	Percent
Scoping	7	35
Assessing and mitigation	8	40
Reviewing and decision-making	5	25
Monitoring	4	20

Table 4.17 shows that only 35% of the respondents agreed that the public is involved in the scoping stage. This has a negative impact on the effectiveness of EIA in Rwanda since scoping should begin with the identification of all stakeholders including individuals, communities, civil society, local authorities and statutory consultees who are likely to be affected by the project and bring them together with the developer to discuss and suggest the important issues to consider during the EIA study and eliminates those that are of little or no concern (REMA, 2006; Glasson *et al.*, 2005). The above results also show that 40% of respondents agreed that the public is involved in the assessing and mitigation stages of EIA. However, 40% is not enough considering the importance of public involvement during this stage as shown by Wood (2003) that local people can assist not only by helping to determine significance but also by providing baseline environmental data.

The above table 4.17 also shows that only 25% of the respondents agreed that the public is involved in the reviewing and decision-making phase of EIA. It has been shown in table 4.3 that it is the responsibility of EIA officers to review the EIA reports. However, it is not only the EIA officers who should review the report as shown in the literature review by Glasson *et al.* (2005). According to the five categories of individuals or institutions who should review the EIS shown by Glasson *et al.* (2005), it is obvious that the public is needed to participate in the review as other stakeholders which is not the case in Rwanda. In addition, the above results undermine the involvement of the public in decision-making in Rwanda whereas Faircheallaigh (2010) and Momtaz (2002) argue that the competent authority is required to consider all necessary environmental

information and consult all statutory consultees and the public in order to come up with a pertinent decision on a project.

Lastly, the table above shows that only 20% of respondents agreed that public is involved in monitoring and evaluation. This has significant negative impacts on the effectiveness of EIA in Rwanda as Glasson *et al.* (2005) assert that since monitoring implies the repetitive collection of a potentially large quantity of information over a period of time, it should involve interested and affected people. In addition, it is obvious that the public is not involved adequately in impact monitoring in Rwanda since table 4.11 shows that the majority of respondents submitted that impact monitoring is not often carried out after the project approval.

Table 4.18: Ways in which public are encouraged to participate in EIA (multiple responses)

	Frequency	Percent
Participation in meetings	3	15
Using announcement from radio, newspapers and television	2	10
Posters	1	5
Individual interviews	1	5
No specific measures	7	35
Public hearing	5	25
People are not interested because they don't know the importance of EIA	1	5

Five percent of respondents stated that people are not interested in participating in the EIA process because they don't know the importance of EIA and the largest number of respondents (35%) asserted that there are no specific measures or ways of encouraging people to participate in EIA (Table 4.18). This clearly shows the weakness of public participation in the EIA process as well as EIA awareness in Rwanda. However, other methods for encouraging the public to participate in EIA indicated in table 4.18 were expected since Faircheallaigh (2010) and ECA (2005) show that the main ways of encouraging people to participate in EIA are public hearings, public meetings, open

days/open hours, briefings, central contact person, field offices or information centres, comment and response sheets, surveys, questionnaires and polls, interviews, telephone hotlines, electronic democracy, workshops, focus groups or key stakeholder meetings, advisory panels and committees, task force, citizen juries and consensus conferences. Therefore, as per the responses, some of these ways of encouraging people to participate in EIA are being covered but not all.

Table 4.19: Level of effectiveness of participation of affected and interested people in EIA process (in %, n=20)

Strongly effective	Effective	Neutral	Ineffective	Strongly ineffective
5	35	15	30	15

Table 4.16 indicated that the public is involved in EIA process but at a certain level. Therefore, table 4.19 reflects respondents' perceptions regarding the effectiveness of that involvement of affected and interested people in the EIA process in Rwanda. The above results show that the effectiveness of the participation in EIA is problematic since 45% of respondents assert that it is ineffective and 15% of respondents are neutral which means that they are not sure if it is effective or not. This makes the effectiveness of the EIA system in Rwanda to be questionable. On the other hand, it is obvious that interested and affected people cannot participate at the same level because of different factors as the World Bank (1999 cited in Aucamp, 2009) stresses that the level of participation will differ widely according to the nature of the intervention and the knowledge and abilities of those interested and affected. However, Aucamp (2009) indicates that the involvement during the different phases of the project will differ as the knowledge of the stakeholders increases. Furthermore, it is through this participation of interested and affected people where trust between the developer and stakeholders develops (Aucamp, 2009). In other words, the appropriate ways of encouraging participation and a good relationship among companies and their neighbours are an essential requirement to ensure the effectiveness of the participation of interested and affected people in EIA processes.

4.4.8 The stakeholders in the EIA process in Rwanda

Table 4.20: Respondent's perceptions of who the stakeholders engaged in EIA processes are (multiple responses) (n=20)

	Frequency	Percent
Lead agencies	14	70
Developers	12	60
Private institutions	8	40
NGOs	5	25
EIA experts (consultants)	9	45
Lecturers	1	5
Donors	1	5
Local authority	13	65
Other ministries	3	15

According to the results from above table 4.20, the respondents perceive that there are four stakeholders who are mostly engaged in EIA processes in Rwanda. These are lead agencies which are indicated by 70% of respondents, developers which are indicated by 60% of respondents, local authority which is indicated by 65% of respondents and consultants which are indicated by 45% of respondents. However, table 4.20 indicates that private institutions, NGOs, lecturers at different universities in Rwanda, donors and other ministries are also engaged but at a limited level. The above results were expected since REMA (2006) defines EIA stakeholders as individuals, communities, government agencies, private organisations, non-governmental organisations or others having an interest or stake in both the EIA process and outcomes of the projects. In addition, EIA general guidelines in REMA (2006) provide the role and responsibility of each stakeholder in the EIA process. However, it is a big challenge relating to the effectiveness of EIA not to consider the public as an EIA stakeholder. Furthermore, all stakeholders should be engaged equally as indicated by ECA (2005) that it is important to involve all stakeholders at the same level and have the necessary capacity and expertise to effectively administer and apply EIA as a tool.

Table 4.21: Level of agreement with specific statements related to stakeholders in EIA processes (in %, n=20)

	Strongly Agree	Agree	Neutral	disagree	Strongly disagree	No option
Affected and interested people are considered as stakeholders in EIA process	15	10	25	20	30	-
Developers are considered as stakeholders in EIA process	45	40	10	-	-	5

Table 4.21 indicates that the half of respondents disagreed with the statement that affected and interested people are considered as stakeholders in the EIA process in Rwanda whereas the overall agreement with this statement is only 35% of respondents. As per responses above, it seems that interested and affected people (public) are not considered as stakeholders in the EIA process in Rwanda while some authors like Aucamp (2009) refer to the term “stakeholder involvement” as public participation. This has a negative impact on the effectiveness of EIA in Rwanda since the public plays a key role in the EIA process as discussed above. However, tables 4.16 and 4.19 show that some of respondents believe that the public is involved in EIA in Rwanda. Therefore, the findings of table 4.21 were also expected since 40% of respondents in table 4.16 disagreed with the statement that the public is involved in the EIA process in Rwanda. In other words, the confusion is in relation to the term “stakeholder” which is misunderstood by EIA practitioners in Rwanda. Eight five percent of the respondents agree that developers are considered as stakeholders in the EIA process. This has also been confirmed by the results from table 4.20 that developers are among the people who are involved in EIA and it has a considerable contribution on the effectiveness of EIA in Rwanda as shown above by ECA (2005) that developers have a vital role and responsibility in the EIA process.

4.4.9 The impact of different policies on EIA processes in Rwanda

Table 4.22: Respondent's perception of the policies which impact on EIA processes in Rwanda (multiple responses)

	Frequency	Percent
Environmental policy	14	70
Agriculture policy	1	5
Transport policy	1	5
Water and sanitation policy	5	25
Land policy	10	50
Economic Development and Poverty reduction Strategy	2	10
Investment policy	1	5
Policies related to international conventions	1	5
Expropriation policy	1	5
Wetland reclamation policy	1	5
Housing and construction policy	1	5
Natural resources management policy	1	5

Table 4.22 depicts the policies which the respondents identified that impact on EIA processes. Environmental policy is ranked the highest policy to impact on EIA processes and also half of respondents indicated that land policy also impacts on EIA processes. This was expected since environmental policy is considered as the overall guiding document regarding environmental issues. In addition, the land policy also impacts considerably on EIA since figure 4.3 shows that construction projects are the most projects subjected to EIA in Rwanda. However, not only these two policies but also other policies mentioned by respondents in the above table, including agriculture policy, transport policy, water and sanitation policy, Economic Development and Poverty Reduction Strategy (EDPRS), investment policy, policies related to international conventions, expropriation policy, wetland reclamation policy, housing and construction policy and natural resources management policy were expected since Organic Law N°

04/2005 of 08/04/2005 determining the modalities of protection, conservation and promotion of the environment in Rwanda, in its Article 67 stipulates that every project must be subjected to EIA, before authorisation for implementation can be granted. In other words, since EIA became a legal requirement in Rwanda in 2005, all related policies and legislations should be revised after this date and incorporate EIA requirements like in other countries. For instance, in Uganda, the conduct of EIA prior to the implementation of new projects is embedded in the Investment Code, the Water Act, the Forest and Tree Planting Act of 2003, the Petroleum Supply Act of 2003 and the Wetlands Policy (ECA, 2005).

Table 4.23: Respondents' perceptions of whether they are familiar with the legal framework and policies including recent changes

	Frequency	Percent
Yes	18	90
No	2	10
Total	20	100

Almost all respondents (90%) agree that they are familiar with the legal framework and policies including recent changes. The recent changes refer to the transfer of DEIACE to RDB. Therefore, since February 2009, RDB became the EIA administrative body through its unit of Environmental Compliance, Awareness and Cleaner Production. To have RDB as an EIA administrative body, it has its advantages and disadvantages as discussed in section 4.2.1 indicating institution and job title of respondents. However, if almost all respondents are comfortable with those changes it means that the changes were necessary.

Table 4.24: Respondents' perceptions of the policy challenges or gaps regarding EIA (multiple responses)

	Frequency	Percent
Lack of EIA guidelines for some sectors	2	10
Lack of baseline data	1	5
Lack of qualified experts in some specific sectors	1	5
Development is very fast and environmental issues are not included in the preparation of policy	1	5
Environmental policy was prepared before Environmental regulations, it does not include EIA	2	10
No master plan and no assigned areas to particular activities	2	10
EIA still new and unknown	2	10
Lack of environmental awareness	3	15
Lack of stakeholders training	1	5
Lack of environmental education	2	10
Lack of infrastructure	1	5
Institutional restructuring	1	5
Lack of policy for some natural resources	1	5

Table 4.24 shows different challenges raised by the respondents during this research but most of them were expected since they have been found by other authors in different countries, especially in developing countries as discussed in the literature review. These challenges are mainly grouped into four categories, notably, challenges regarding guidelines and policy, information, human resource capacity, and institutional restructuring.

According to the perception of respondents, the challenges related to guidelines and policy are lack of EIA guidelines for some sectors, development is very fast and environmental issues are not included in the preparation of policy, environmental policy was prepared before environmental regulations and it does not include EIA, lack of a master plan and assigned areas to particular activities and lack of policy for some natural

resources. However, the report of second EIA sector guidelines validation workshop of 2008 reveals that audit guidelines, waste management guidelines, water resources guidelines, wetland management, road construction guidelines, hydroelectric power development guidelines and housing development guidelines were developed in 2008 to supplement and help EIA general guidelines (REMA, 2008). Therefore, with reference to the list of projects subjected to EIA shown in figure 4.3, it is imperative to provide other sector guidelines related to projects and involve all agencies which are in charge of these sectors in that process.

The problem of the speed of development which is very fast and lack of mainstreaming of environmental issues in the preparation of policies was expected since in table 4.13 almost all of the respondents stated that there is no SEA in Rwanda. Therefore, environmental issues are not well mainstreamed in the preparation of policies since there is no SEA as a tool which can help to address environmental problems on the policy, programme and plan level as shown above in section 4.4.6 entitled SEA in Rwanda. The problem of environmental policy in Rwanda which does not include EIA requirements was also expected since environmental policy in Rwanda was adopted in 2003 whereas EIA became a legal requirement in 2005 (REMA, 2006). As discussed above, not only environmental policy but also other policies adopted before 2005 have to be revised and include EIA requirements. Lack of a master plan and lack of specific areas assigned to particular activities were submitted as policy challenges by 10% of the respondents. This also reflects the issue of SEA which is not conducted in Rwanda since different plans are considered as sub-components of a policy. However, Kigali City approved its first comprehensive master plan in 2008 which shows the areas reserved for industries, residential purposes and so on but it is also important to have a master plan for other cities in Rwanda.

Lack of policy for some natural resources was also recognised by one respondent as one of challenges of policy implementation. It is obvious that this can impact on policy implementation since the EIA process touches on different projects from different

policies. However, this concern is baseless since Rwanda already has policies regarding different natural resources including water, land, mines, agriculture, and wetlands.

Secondly, the challenges related to the information submitted by the respondents are lack of baseline data, EIA which is still new and unknown, lack of environmental awareness and lack of environmental education. However, the problem of lack of baseline data was expected since it has been identified as the biggest challenge of EIA in different developing countries like Ghana (Opoku, 2001) and Lesotho (Mokhehle and Diab, 2001). In addition, to say that EIA is new is obvious since it was only introduced in 2005 in Rwanda. But being unknown is not a problem of the time of its introduction in Rwanda, it is a problem of environmental awareness also identified by 15% of the respondents. The problem of environmental awareness is a result of poor environmental education which has also been identified by 10% of the respondents as a challenge for policy implementation. Therefore, lack of environmental awareness and poor environmental education was expected since the REMA report (2008) shows that EIA and other environmental issues are not infused in the education curriculum in Rwanda.

The identified challenges regarding human resource capacity are lack of qualified experts in some specific sectors, lack of stakeholder training and lack of infrastructure. Lack of qualified experts in specific sectors has been indicated by 5% of the respondents as a challenge for policy. This has been supported by ECA (2005) which indicates that most African countries have identified that inadequate expertise of EIA practitioners in different sectors hampers the effectiveness of EIA. Furthermore, lack of stakeholder training and infrastructure has been recognised as challenges for policy implementation since UNEP (2004) shows that institutional capacity (intellectual and material) can greatly influence policy implementation. This also has been found by ECA (2005) which indicates that government institutions are not the only entities facing capacity problems in terms of staffing, expertise and materials in different African countries. Furthermore, SAIEA (2003 cited in ECA, 2005) asserts that the problem is more acute in the private sector, NGOs and community-based organisations (CBOs) which have lamented the lack of resources and capacity to act as effective monitors of the EIA process.

Finally, 5% of the respondents stated that institutional restructuring is also one of the challenges of policy implementation in Rwanda. This was also expected since in February 2009, DEIACE was transferred to the RDB. However, restructuring is initiated for better improvement but during that process it is obvious that some people cannot cope with the changes or new working environment. Therefore, this can have a negative impact on policy implementation.

4.4.10 Responsibilities of the Rwandan government in the EIA process

Table 4.25: Respondents' perceptions of the responsibilities of the government in relation to EIA (multiple responses)

	Frequency	Percent
Sensitisation of the public and private sectors in environmental compliance	7	35
Enforcement	12	60
Audit of projects	2	10
Putting in place and updating regulations and laws accordingly	8	40
Capacity-building in public sector	7	35
Understanding its role as stakeholder in EIA	1	5
Ensure adequate implementation of mitigation measures	1	5
To speed up EIA process	1	5

Government is an institution that encompasses central government and decentralised entities (local government). However, responsibilities of government refer to central government including all lead agencies (ministries and other public institutions) which have a role to play in one way or another in the EIA process. All responses stated in the above table 4.25 resume the responsibilities of the government in relation to EIA in three categories including raising awareness, regulation and institutional capacity-building.

Concerning the responsibility of raising awareness, thirty five percent of the respondents showed that sensitisation of the public and private sectors in environmental compliance is one of the responsibilities of government. This was expected since Environmental Organic Law No.04/2005 of 2005 in its Article 58 stipulates that the government shall take adequate measures to promote environmental education, training and sensitisation in schools' curricula at all levels. It may approve the creation of associations for the conservation of the environment. Furthermore, understanding its role as a stakeholder in EIA was also identified by one of respondents as a government responsibility. However, government to understand its role is not a responsibility per se, but to accomplish its mission, especially its role in the EIA process, is what matters. REMA (2006) asserts that the role of lead agencies is to help REMA to review project briefs and provide necessary input during screening to provide input on ToR and to review and make comments on EIA reports.

Secondly, respondents stated that government as a regulator has the following responsibilities: putting in place and updating regulations and laws accordingly, ensure adequate implementation of mitigation measures, to speed up EIA processes, and enforcement and audit of projects. Forty percent of the respondents confirm that putting in place and updating laws and regulations is a government responsibility. This was also expected since REMA (2006) stipulates that one of its responsibilities is to manage the production and updating of guidelines on EIA practice, procedures and regulations as well as preparation of sector-specific EIA guidelines. In a similar vein, 5% of the respondents identified ensuring adequate implementation of mitigation as one of the government responsibilities. This responsibility was also expected since it is a sub-component of monitoring and auditing of projects which is also identified as a responsibility of the government. Speeding up the EIA process was recognised by one of the respondents as a government responsibility. There are several factors which can influence the speed of the EIA process, notably, institutional capacity, resources, quality of EIA and experience of EIA practitioners involved in that process (ECA, 2005). In addition, Fischer (2003) stresses that SEA can speed up the EIA process by reducing the

number and complexity of project EIAs. Unfortunately, SEA is not conducted in Rwanda. Table 4.25 also shows that 60% of respondents indicated that enforcement of environmental regulations is also government's responsibility. As shown in the literature review, DEAICE's main responsibility was to enforce environmental standards, norms, guidelines and procedures. Furthermore, 10% of the respondents submitted that auditing of projects is also one of government's responsibilities. This was expected since in table 4.3 audits of projects have been classified as one of the responsibilities of EIA officers. In other words, it is a responsibility of the competent authority which is also part of government.

Lastly, capacity-building was also identified by 35% of the respondents as one of the government responsibilities. It is obvious that all public institutions have the responsibilities of providing necessary training and adequate materials to their staff in order to ensure their efficacy and efficiency. However, it is also a responsibility of government to train all stakeholders in order to insure the effectiveness of EIA as shown by ECA (2005).

4.5 Challenges facing environmental officers in Rwanda

Table 4.26: Level of agreement with specific statements related to the challenges facing environmental officers (in %, n=20)

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	No option
Insufficient baseline data	55	35	5	5	-	-
Shortage of staff in the department of EIA	75	25	-	-	-	-
Lack of adequate materials in the department	30	30	35	-	5	-
Lack of political will of decision-makers	5	5	5	25	60	-
Developers consider EIA as a barrier to their projects	50	35	15	-	-	-
Priority of the country is development rather than environmental protection	-	5	5	55	35	-
EIA being reactive rather than being proactive process	5	35	50	5	5	-
Inability to predict cumulative impacts	15	45	25	10	5	-
Decisions are not based on the environmental officer's comments		5	45	35	15	-
Misunderstanding between environmental officers and local authorities	5	5	60	25	5	-
Shortage of funding to pursue EIA	20	45	25		10	
Lack of training for environmental officers	20	70	10	-	-	-
Poor environmental awareness in the country	25	50	15	10	-	-

Table 4.26 illustrates the challenges facing EIA officers which are also the key aspects of this research. In fact, the challenges facing EIA officers are also the challenges of the EIA process in one way or another. The overall agreement with the statement that insufficient baseline data is a challenge to the EIA officers was confirmed by 90% of the respondents. With reference to the steps of the EIA process, insufficient baseline data can impede on screening processes, ToR formulation, EIA review and monitoring since baseline information helps them to trace changes of variables in time and space and in

particular on the occurrence and magnitude (Glasson *et al.*, 2005). As shown in the literature review, this challenge of insufficient baseline data has been identified mostly in different developing countries, notably, Brazil (Glasson and Salvador, 2000), India (Paliwal, 2006) and Lesotho (Mokhehle and Diab, 2001).

Seventy five percent of the respondents strongly agreed that the shortage of staff in the department of EIA is also a challenge for EIA officers while 25% also agreed with this statement. The shortage of staff in the EIA department is a challenge for EIA officers since it impacts negatively on the productivity of EIA officers and the EIA department in general. Furthermore, Morrison-Saunders and Bailey (2009) reveal that there are two consequences of the shortage of EIA regulators including a tendency to emphasise procedures and the available staff are put under increasing pressure to cope with the extra workload that arises. In addition, the shortage of staff also impact negatively on the department's capacity-building plan for their workers since some EIA officers can refuse to participate in different training because no one can replace them while they are away. This problem of understaffing in EIA departments is common, especially in African countries as shown by different authors. For instance, understaffing problems in EIA departments are found in Lesotho with only three EIA officers present (Mokhehle and Diab, 2001), in Mozambique with only eight staff (Hatton *et al.*, 2003) and in Zambia with five EIA officers (Chapman and Walmsley, 2003). In Rwanda, table 4.1 shows that there are eight EIA officers but since the transfer of the EIA responsibility to RDB only four EIA officers and their Director are working with the EIA department within RDB. Therefore, this confirms the problem of understaffing in the EIA department.

Sixty percent of the respondents strongly agreed or agreed with the statement that the lack of adequate material is a challenge for EIA officers. Besides human capacity, lack of adequate material is a considerable factor which can hinder the effectiveness and productivity of EIA officers. Mokhehle and Diab (2001) assert that in the developing countries resources are the biggest challenge not only for EIA officers but also for the whole administrative system. Therefore, in Rwanda, the level of lack of adequate material is considerable since only 60% of the respondents agreed with the statement.

The above table also shows that almost all respondents (85%) refuted that lack of political will of decision-makers in Rwanda is a challenge for EIA officers. This means that most of decision-makers have demonstrated a commitment and offer a conducive working environment to use EIA adequately as a tool for managing social, economic and environmental problems. In other words, it is strength of the EIA process in Rwanda.

Half of respondents strongly agreed whereas 35% agreed that one of the challenges facing EIA officers is that developers consider EIA as a barrier to their projects. This result is not surprising since different authors reveal that in many cases EIA is seen by developers as an impediment to the implementation of their development projects (Morrison-Saunders and Fisher, 2006; Noble, 2006; Modak and Biswas, 1999). Consequently, because of this perception most of developers do not implement all mitigation measures of predicted impacts in the EIA report after receiving their EIA certificate. On the other hand, Noble (2006) asserts that developers can benefit from EIA instead of looking it as a barrier since it makes their projects viable not only by reducing and avoiding negative impacts of their projects but also by reducing the risk of a no go option.

Almost all respondents (90%) refuted the statement that the priority of Rwanda is development rather than environmental protection. According to the findings, this is not a challenge for EIA officers since it can help to achieve sustainable development. However, development and environmental protection are two crucial aspects and one impacts on the other. Therefore, both must be prioritised in order to achieve sustainable development. This can also contribute to the effectiveness of the EIA process in Rwanda since the objective of EIA is to promote development that is sustainable and can optimise resource use and management opportunities (Thomas and Elliot, 2005; ECA, 2005).

Table 4.26 depicts that the total agreement with the statement that EIA is reactive rather than being a proactive process in Rwanda is 40% of the respondents whereas 50% are neutral. These findings are supported by Morrison-Saunders and Fisher (2006) that one of the limitations of EIA is to react to developmental proposals rather than anticipate them.

This is a challenge facing EIA officers and the EIA process because it is difficult to assess the impacts of projects since baseline of environmental features has already been destroyed by the project. In addition, it can engender a big loss to the developers if the authority finds some adverse environmental impacts in relation to the implementation of that project.

Sixty percent of the respondents agreed that the inability to predict cumulative impacts is a challenge facing EIA officers and the EIA process in general. This is a challenge globally since it has been found by different authors in most developed and developing countries. For instance, it has been found in the USA (Espinoza and Richards, 2002), in the UK (Benson, 2003), in France (Glasson and Bellanger, 2003), in countries like Sri Lanka, Vietnam, and Saudi Arabia (Morrison-Saunders and Fisher, 2006) as well as in most African countries (UNEP, 2004). Indeed, Cooper and Sheate (2002) argue that the inadequacy of cumulative effects assessment in UK is due to two reasons, notably, lack of agreed definition of cumulative impacts and lack of specific requirements in the legislation as to how cumulative effects could be addressed. In addition, the lack of guidance and frameworks for the assessment of cumulative effects in the UK are some of the constraints for EIA practitioners (Cooper and Sheate, 2002). This has a great impact on the effectiveness of EIA (Benson, 2003).

Only one respondent agreed that decisions are not based on the environmental officers' comments. This shows that the comments and recommendations of EIA officers after reviewing EIS are valuable in the decision-making phase in Rwanda. It has a positive impact on the effectiveness of EIA as Momtaz (2002) asserts that the competent authority is required to consider all necessary environmental information and consult all statutory consultees and the public in order to come up with a pertinent decision on a project.

Sixty percent of the respondents were neutral while 30% disagreed that misunderstanding between EIA officers and local authorities is one of the challenges facing EIA officers. According to the above findings, this is not perceived as a major challenge in Rwanda. However, some countries consider this misunderstanding as a big challenge. For instance,

Alemagi *et al.* (2007) state that misunderstanding between EIA officers and local administration in Cameroon is due to a highly centralised EIA system and lack of trained staff in the districts. In addition, Devnyst (2000) confirmed that in many regions of Belgium local authorities are not involved in EIA. Besides capacity problems, environmental officers at the district levels are not involved in EIA review and decision-making processes in Rwanda. Furthermore, all local authorities sign the performance contracts with his Excellence President of the Republic at the beginning of the year. Therefore, they want all proposed projects in their districts to be implemented in order to honor their promises. In case of a no go option, this can contribute to misunderstanding between EIA officers and local authorities.

The majority of the respondents (65%) strongly agreed or agreed that shortage of funding to pursue EIA is also one of the challenges facing EIA officers. According to Retief and Chabalala (2009) and El-Fadel *et al.* (2000), the primary sources of projects' funds and loans in developing countries included the European Commission and international funding organisations like the WB. Therefore, as shown in the literature review, Rwanda also does not possess adequate economic resources to finance entire reconstruction and development projects. As such, it is required to seek external funds particularly for the larger projects dealing with infrastructure and waste management. Since EIA is a requirement to access those funds, these international agencies have a tendency not to fund the EIA studies so the developers try on their own to cover EIA costs in order to meet the requirements of accessing the funds for their projects. However, the fact that EIA studies are not funded leads to poor EIA reports which render EIA reviews difficult and time-consuming for EIA officers.

Lack of training for environmental officers is regarded as one of the biggest challenges facing EIA officers in Rwanda since 90% of the respondents strongly agreed or agreed with this statement. Different authors have stressed the importance of training to increase the EIA regulators' capacity to undertake and review EIAs in developing countries (ECA, 2005; Mahiber, 2008; Wood, 2003). Therefore, human resource development should be the top priority in developing countries, including Rwanda. However, Wood (2003) and

ECA (2005) argue that EIA training needs to relate not just to government officials but also to personnel in environmental consultancies, universities and research institutes. In addition, both longer-term and specialised short courses are necessary (ECA, 2005; UNEP, 2004; Wood, 2003).

Lastly, table 4.26 shows that the majority of respondents (75%) strongly agreed or agreed that the poor environmental awareness is a challenge facing EIA officers in Rwanda. This was expected since REMA and the EIA process started only in 2005 in Rwanda. Furthermore, Mahiber (2008) reveals that lack of awareness about environmental issues, especially EIA among different stakeholders, is a hindrance to the effectiveness of the EIA process in developing countries. In addition, even those who are placed in a position to implement the laws in government institutions do not have sufficient knowledge about these environmental laws in Ethiopia (Mahiber, 2008). Faircheallaigh (2010) asserts that it is difficult to implement EIA when even the community and developers do not have sufficient knowledge about environmental issues, especially EIA procedures and regulations.

4.6 Conclusion

This chapter presented the findings of this research in the form of tables, figures as well as descriptions. Furthermore, the researcher used the literature available to analyse and discuss these findings. Therefore, this analysis and discussion of findings helped the researcher to conclude in the following chapter and suggest some recommendations concerning the effectiveness of EIA in general and challenges facing EIA officers in Rwanda in particular.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The main aim of this study was to assess the EIA process in Rwanda and identify the major challenges faced by environmental officers in implementing EIA processes. In this chapter, the summary of the key findings based on the objectives of this study are presented. In addition, by linking the key findings to what has been covered in the literature review and data analysis chapters, the recommendations and general conclusions are also submitted in this chapter.

5.2 The key findings in relation to the objectives of the study

5.2.1 The profile and skill levels of Environmental Officers in Rwanda

The first objective of this study is to examine the profile and skill levels of environmental officers in Rwanda. To assess the profile and skills level of environmental officers (EIA officers), the following aspects are considered: number of EIA officers and their institutions, job responsibilities of EIA officers, level of education and relationship between the domain of studies of EIA officers and their current job, professional training attended as well as the skill gaps of EIA officers in Rwanda.

In Rwanda, there are eight EIA officers but five of them work with the RDB while three work with REMA. The main responsibilities of EIA officers are to screen the project briefs, to conduct site visits, to develop the terms of reference of EIA studies, to review EIA reports, to participate in public hearings and to undertake the monitoring and audit of projects after their implementation.

The EIA consultants in Rwanda are more educated than EIA officers since the majority of EIA officers (five) possess BSc, two have PgD and only one has MSc whereas the majority of consultants (seven) possess a master's degree, three have BSc and one has a PhD. Furthermore, the EIA officers' domains of studies are generally related to their job.

Five of the EIA officers attended one to five professional training sessions while two EIA officers attended six to ten training sessions and only one EIA officer attended eleven to fifteen professional training sessions. However, EIA consultants are more trained than EIA officers. EIA procedure training is the most attended training session by EIA officers since it was attended by four EIA officers. The environmental management training ranked second and was attended by three EIA officers. Although all training sessions attended by EIA officers are related to EIA, some of EIA officers have skill gaps including using GIS and remote sensing, understanding project management and customer care skills. On the other hand, EIA practitioners have some skills as their strength, notably, computer literacy, using English as an administrative language in Rwanda, public participation facilitation skills, integration of technical and social concerns in the EIA report review, impact assessment and prediction skills, mitigation measures and alternative formulation skills, monitoring and evaluation skills, and EIS reviewing skills.

5.2.2 The level of experience among Environmental Officers in Rwanda

The majority of EIA officers (six) have between three and four years of experience, two EIA officers have less than one year of experience and one EIA officer has five to six years of experience. There is no EIA officer who has more than seven years of experience since EIA started in 2005. However, EIA officers are more experienced than EIA consultants in Rwanda since the average number of years of experience for EIA officers was calculated as 3.1 years while the average number of years of experience for the consultants was 2.8 years.

5.2.3 Current EIA procedure and implementation in Rwanda

The third objective of this study was to critically assess current EIA procedures and its implementation in Rwanda. Therefore, to achieve this objective, this research focused on the following issues: the relationship between developers and their consultants, the

reasons for doing EIA in Rwanda, the weakness of implementation of EIA procedures in Rwanda, the types of projects and stage of the project where EIA is carried out, the state of SEA in Rwanda, public participation in EIA processes in Rwanda, stakeholders involved in the EIA processes in Rwanda, the impact of different policies on the EIA processes in Rwanda and finally, the responsibilities of the Rwandan government in EIA processes.

There is poor communication and interaction between developers and their consultants in Rwanda not only because developers do not provide enough information and follow-up to their consultants but also because of lack of regular meetings between developers, consultants and the authority. Furthermore, these reasons are exacerbated by the lack of knowledge about EIA among developers. The main reason for doing EIA in Rwanda is not to comply voluntarily with Environmental Organic Law but developers undergo EIA processes either to obtain land title and building authorisation from the district authority or to fulfill the requirements of getting loans from local banks and international funders.

The implementation of EIA procedures in Rwanda has the following weaknesses: most of the ToR of EIA studies are prepared by the authority instead of being a compilation of critical issues submitted by specialists in different domains during the scoping process; most of the EIA report review processes do not respect the 20 days period provided by the EIA guidelines; and the lack of impact monitoring and environmental audit after project approval. Furthermore, all steps provided by general EIA guidelines in Rwanda are not respected. The EIA process starts during the planning stage of the project. Furthermore, EIA officers in Rwanda are mostly involved in construction projects, agricultural projects and factories. Projects related to water supply, oil and gas, telecommunication, fuel service stations, waste treatment and wetlands utilisation are the least projects subjected to EIA in Rwanda.

The reasons for not conducting SEA in Rwanda are attributed to the lack of specific SEA guidelines in Rwanda, lack of capacity to conduct SEA and the fact that there is no importance given to SEA because it still a new tool. On the other hand, the importance

of SEA is to integrate environmental concerns in the national policies, plans and programmes.

Public participation in EIA processes in Rwanda is weak. Even where the public is involved, people are involved only in the scoping and impact assessment steps of EIA. Furthermore, there are different ways in which the public are encouraged to participate in EIA in Rwanda, notably, public meetings, using announcements from radio stations, newspapers and television, posters, individual interviews as well as public hearings. However, it is believed that the reasons for the ineffective participation of affected and interested people are that some people are not interested in EIA because they do not even know the importance of it and also there are no specific measures to encourage people to participate effectively in EIA processes.

The stakeholders in EIA processes in Rwanda are mostly lead agencies, developers, consultants and local authorities. However, the participation of private institutions, NGOs, lecturers and donors is limited. In addition, it is noted that during EIA implementation, affected and interested people are not considered as EIA stakeholders. In Rwanda, there are different policies which impact on EIA processes. Nevertheless, the EIA processes are mostly impacted by the environmental policy, the land policy as well as the water and sanitation policy.

Even if EIA practitioners are comfortable and familiar with the current EIA legal framework, policies and the recent changes of transferring the EIA department from REMA to RDB, there are some policy challenges regarding EIA in Rwanda. These challenges are mainly grouped into four categories: challenges regarding guidelines and policy, information, human resource capacity, and institutional restructuring. Furthermore, the identified challenges related to guidelines and policy are lack of EIA guidelines for some sectors, development which is very fast and environmental issues which are not included in the preparation of policies, environmental policy which was prepared before environmental regulations and consequently it does not include EIA, lack of a master plan and assigned areas to particular activities, and lack of policy for some natural resources. The challenges related to information in Rwanda are lack of baseline

data, EIA which is still new and unknown, lack of environmental awareness and lack of environmental education. In addition, the challenges regarding human resource capacity are lack of qualified experts in some specific sectors, lack of stakeholder training and lack of infrastructure. Lastly, the responsibilities of the government of Rwanda regarding EIA procedures and implementation are presented in three categories including raising awareness, environmental regulation and institutional capacity-building.

5.2.4 The challenges faced by environmental officers in implementing EIA processes in Rwanda

The fourth objective of this research was to identify the challenges faced by environmental officers in implementing EIA processes in Rwanda. The following challenges were identified: insufficient baseline data, shortage of staff in the EIA department, lack of adequate material in the EIA department, the fact that developers consider EIA as a barrier to the implementation of their project, the inability to predict cumulative impacts, shortage of funding to pursue EIA studies, lack of training for environmental officers and lastly, poor environmental awareness in the country hinder the EIA officers to do their job effectively. It has also been noted that having investment promotion and EIA departments under the same roof can impact negatively on the implementation of EIA process since the investment promotion department has a tendency of influencing the EIA department.

5.3 Recommendations

The combination of results obtained in this research and the literature about EIA lead to a number of recommendations to ensure better EIA process in Rwanda. These recommendations are presented below.

The number of EIA officers should be increased in order to enable them to fulfill their responsibilities. However, the recruitment process of EIA officers should emphasise on experience. In addition, it is imperative to incorporate social sciences in the requirements of the domains of studies for EIA officers.

The level of education and essential professional training for an EIA officer in Rwanda should be increased. For instance, EIA officers in Rwanda need to strengthen their knowledge in using GIS and remote sensing, understanding project management, improving customer care skills, and to assess and predict cumulative impacts of projects. Furthermore, the EIA department should provide enough and necessary material to improve not only the efficiency of EIA officers but also to improve their working conditions. Therefore, the above recommendations will strengthen the EIA department in order to improve the effectiveness of EIA processes and to avoid the risk of being influenced by the investment and business department in RDB.

In the bid to improve the effectiveness of EIA procedure implementation in Rwanda, the following actions need to be addressed: ToR of EIA studies should be developed by consultants and approved by the authority, the period of 20 days provided by the EIA guidelines for an EIA report review should be respected, the level of environmental monitoring and audit in the EIA process should be improved, and all steps provided by general EIA guidelines in Rwanda should be respected in EIA implementation. The government of Rwanda should put in place the new mechanisms of raising environmental awareness and should reinforce existing ones. Particularly, the awareness about EIA processes should be focused on and improved in Rwanda. This can improve the knowledge of developers about EIA and the interaction of consultants, developers and the authority. Furthermore, this can also not only lead to voluntary compliance with Environmental Organic Law but can also make developers to focus on the benefits of EIA on development in general and on their projects in particular, rather than considering it as a barrier for their projects. To facilitate this process, the authority (EIA department) should also improve its ways of communication by providing regular meetings with developers, EIA consultants and other important EIA stakeholders in Rwanda.

The participation of private institutions, NGOs, lecturers, donors as well as affected and interested people as EIA stakeholders should be improved. Particularly, public participation in EIA processes should be improved in Rwanda. For instance, the EIA department and proponents should provide the specific measures to encourage affected

and interested people to participate during different steps of the EIA processes. Therefore, this can contribute to the effectiveness of EIA processes. To facilitate this community and engagement process, the EIA officers need to increase their level of facilitation of public hearings.

REMA and other leading agencies in Rwanda should create a data bank of all necessary environmental information in Rwanda in order to solve the problem of insufficient baseline information. Furthermore, infrastructure should be improved to facilitate the collection, storage and access of environmental information in Rwanda.

Since EIA is a legal requirement in Rwanda, all related policies and legislations which do not include EIA requirements should be revised and incorporate it, especially the environmental policy which was adopted in 2003 whereas EIA became a legal requirement only in 2005. In addition, policies and EIA guidelines for some sectors where they do not exist or are inadequate should be developed. To facilitate the implementation of this, all government agencies which are in charge of relevant sectors should be involved in the process. In a similar vein, the master plans of different towns and cities in the country should be developed. This will enable the government to assign specific areas for particular development activities. To solve the problem of shortage of funds, international and local funding institutions as well as the government and private institutions should provide adequate funds for EIA studies in order to improve the effectiveness of EIA in Rwanda. To improve the implementation of EIA procedures, the EIA department which was transferred to RDB should be based in REMA which is mandated by the law to issue EIA certificates.

Lastly, SEA should be conducted and incorporated also in the Environmental Organic Law as a requirement to include environmental concerns at the strategic level of planning in Rwanda. However, since SEA is a new tool, REMA should provide SEA guidelines. To facilitate the adoption and integration of SEA, SEA training should be increased in order to create awareness about it among all SEA stakeholders and also to train professionals on how to conduct SEA in Rwanda.

5.4 Conclusion

This research aimed to assess the EIA process in Rwanda and identify the major challenges faced by environmental officers in implementing EIA processes. It is imperative to note that the objectives of this study have been addressed. In addition, as far as the topic of this research is concerned, fruitful recommendations were submitted not only to solve identified challenges of EIA officers but also to improve the EIA processes in general. It is imperative to note that this study looked at the perceptions of the EIA officers and consultants. It is also interesting that skill levels suggest gaps but respondents generally think they are effective.

In essence, this study has revealed that the implementation of EIA in Rwanda has its weaknesses and strengths. The strength of the EIA process in Rwanda is its strong legal framework (Environmental Organic Law, ministerial orders on EIA procedures and a list of projects which must be subjected to EIA, EIA general guidelines and some EIA sector guidelines) as well as the political will among decision-makers in Rwanda. However, the implementation of EIA processes in Rwanda has the following weaknesses: insufficient staff; insufficient training and inadequate material in the EIA department; lack of respect of all provided steps of EIA procedures; lack of adequate environmental awareness, especially about EIA; lack of participation of some EIA stakeholders, especially affected and interested people; lack of baseline data; different policies which do not include EIA requirements; shortage of funds to conduct EIA studies; and SEA which is not conducted. Therefore, the submitted recommendations should be taken into consideration in order to address these weaknesses. In a similar vein, the uniqueness of the EIA process in Rwanda of having an EIA department under RDB will help not only to improve the pace of EIA reviews and customer care skills among the EIA officers but also to reduce tensions between business facilitators and environmental regulators in government institutions.

Summing up, given the results of this study, it is imperative that future studies relating to the implementation of EIA in Rwanda are encouraged. Such studies should focus more on environmental monitoring and audits of the approved projects, to ascertain if the EMP and mitigation measures submitted during the EIA studies are implemented.

REFERENCES

Ahmad, B. and Wood, C., 2002: A comparative evaluation of the EIA systems in Egypt, Turkey and Tunisia, *Environmental Impact Assessment Review*, 22, 213-234.

Ahammed R. and Nixon B., 2006: Environmental impact monitoring in the EIA process of South Australia, *Environmental Impact Assessment Review*, 26, 426-447.

Alemagi, D., Sondo, Y. and Ertel, J., 2007: Constraints to Environmental impact assessment practice: case study of Cameroon, *Environmental Policy and Management*, 9 (3), 354-382.

Alshuwaikhat, H., 2005: SEA can help solve EIA failures in developing countries, *Environmental Impact Assessment Review*, 25, 307-317.

Antunes, P., Santos, R. and Jordao, L., 2001: The application of geographical information systems to determine environmental impact significance, *Environmental Impact Assessment Review*, 21,511-535.

Asian Development Bank, 2006: *Trainers' Guide for Environmental Impact Assessment Training*, ADB printer, Bhutan.

Aucamp, P., 2009: *Environmental Impact Assessment: A Practical Guide for the Discerning Practitioners*, Van Schaik Publishers, Pretoria.

Baissac, P., 2003: Environmental Impact Assessment in Mauritius in Southern African institute for environmental assessment, *Environmental Impact Assessment in Southern Africa*, Windhoek, Namibia.

Baker, A. and Wood, C., 1999: An evaluation of EIA system performance in eight EU countries, *Environmental Impact Assessment Review*, 19, 387-404.

Benson, J., 2003: What is the alternative? Impact assessment tools and sustainable planning, *Impact Assessment and Project Appraisal*, 21 (4), 261-280.

Bouma, G.D. and Rod, L., 2004: *The Research Process*, Fifth Edition, Oxford University Press, Melbourne.

Bryman, A., 2008: *Social Research Methods*, Third Edition, Oxford University Press, New York.

Burton, D., 2000: *Research Training for Social Scientists: Handbook for Postgraduate Researchers*, Sage, London.

Central Intelligence Agency, 2010: *Geographical Coordinates*. Available at <https://www.cia.gov/library/publications/the-world-factbook/fields/2011.html> accessed on 20th January 2010.

Chapman, K. and Walmsley, B., 2003: Environmental Impact Assessment in Zambia in Southern African institute for environmental assessment, *Environmental Impact Assessment in Southern Africa*, Windhoek, Namibia.

Cooper, L. and Sheate, W., 2002: Cumulative effects assessment: A review of UK environmental impact statements, *Environmental Impact Assessment Review*, 22,415-439.

Cordura, N., 2004: *An Evaluation of Effectiveness of Environmental Impact Assessment in Promoting Sustainable Development in Germany*, Master's thesis, Norwich: University of East Anglia.

Cox, E.P., 1980: The optimal Number of Response Alternatives for a Scale: A Review, *Journal of Marketing Research*, 17, 407-422.

David, M. and Sutton, C.D., 2004: *Social Research: The Basics*, Sage Publications, London.

Department of Environmental Affairs and Tourism (DEAT), 2006: *General Guide to the Environmental Impact Assessment Regulations*, Government Printer, Pretoria.

Devnyst,D., 2000: *Sustainability Assessment at Local Level*, Columbia University press, Brussels.

Dipper B., Jones C. and Wood C., 1998: Monitoring and Post-auditing in Environmental Impact Assessment: A Review, *Journal of Environmental Planning and Management*; 41(6), 731-747.

Dipper B., Jones C. and Wood C., 2000: Auditing the Assessment of the Environmental Impacts of Planning Projects, *Journal of Environmental Planning and Management*, 43(1), 23-47.

Economic Commission for Africa (ECA), 2005: *Review of Application of Environmental Impact Assessment in Selected African Countries*, ECA printer, Addis Ababa.

El-Fadel, M., Zeinati, M. and Jamali, D., 2000: Framework for environmental impact assessment in Lebanon, *Environmental Impact Assessment Review*, 20, 579-604.

Espinoza G. and Richards B., 2002: *Fundamentals of Environmental Impact Assessment*, Inter-American Development Bank (IDB) printer, Santiago.

Esty, D.C., Levy, M.A., Kim, C.H., de Sherbinin, A., Srebotnjak, T. and Mara V., 2008: *2008 Environmental Performance Index*, Yale Center for Environmental Law and Policy, New Haven, USA. Also available on: <http://epi.yale.edu> accessed on 20th November 2009.

Faircheallaigh, C., 2010: Public participation and environmental impact assessment: Purposes, implications, and lessons for public policy making, *Environmental Impact Assessment Review*, 30, 19-27.

Finnveden, G. and Moberg, A., 2005: Environmental system analysis tools: an overview, *Journal of Cleaner Production*, 13, 1165-1173.

Fischer, T., 2003: Strategic Environmental Assessment in Post-modern times, *Environmental Impact Assessment Review*, 23, 155-170.

Fitzpatrick, P. and Sinclair, A., 2009: Multi-jurisdictional impact assessment: Canadian experiences, *Environmental Impact Assessment Review*, 10, 1016-1025.

Fouche, C.B., 1998: *Data Collection Methods in Research at Grassroots: A Primer for the Caring Professions*, Van Schaick Publishers, Pretoria.

Fowler, F., 2002: *Survey Research Methods*, Third edition, Sage publications, California.

Glasson, J., Therivel, R. and Chadwick, A., 1999: *Introduction to Environmental Impact Assessment*, Second edition, Spon press, London.

Glasson, J. and Salvador, N., 2000: EIA in Brazil: a procedure-practice gap. A comparative study with reference to the European Union, and especially the UK, *Environmental Impact Assessment Review*, 20, 191-225.

Glasson, J. and Bellanger, C., 2003: Divergent practice in a converging system? The case of EIA in France and the UK, *Environmental Impact Assessment Review*, 23, 605-624.

Glasson J., Therivel R. and Chadwick A., 2005: *Introduction to Environmental Impact Assessment*, Third edition, Routledge, New York.

Government of Rwanda, 2000: *Vision 2020*, Government printer, Kigali.

Government of Rwanda, 2003a: *Environmental Policy*, Government printer, Kigali.

Government of Rwanda, 2003b: *Constitution of the Republic of Rwanda*, Government printer, Kigali.

Government of Rwanda, 2005: *Organic Law Determining the Modalities of Protection, Conservation and Promotion of Environment in Rwanda*, Government printer, Kigali.

Government of Rwanda, 2006: *Organic Law Determining the Organisation, Functioning and Responsibilities of Rwanda Environment Management Authority*, Government printer, Kigali.

Government of Rwanda, 2007: *Economic Development and Poverty Reduction Strategy 2008-2012*, Government Printer, Kigali.

Government of Rwanda, 2008a: *Ministerial Order Relating to the Requirements and Procedure for Environmental Impact Assessment*, Government printer, Kigali.

Government of Rwanda, 2008b: *Ministerial Order Establishing the List of Works, Activities and Projects that Have to Undertake an Environment Impact Assessment*, Government printer, Kigali.

Henning, E., 2004: *Finding your Way in Qualitative Research*, Van Schaik Publishers, Pretoria.

Hatton, J., Telford, S. and Krugmann, H., 2003: Environmental Impact Assessment in Mozambique in Southern African institute for environmental assessment, *Environmental Impact Assessment in Southern Africa*, Windhoek, Namibia.

Holm-Hansen J., 1997: Environmental Impact Assessment in Estonia and Norway, *Environmental Impact Assessment Review*, 17, 449-463.

International Association for Impact Assessment (IAIA), 2006: *Guidelines for Lead IA Professionals*, IAIA printer, Fargo.

Jackson, W., 1995: *Methods: Doing Social Research*, Prentice-Hall Canada inc., Ontario.

Jackson, C.J. and Furnham, A., 2000: *Designing and Analysing Questionnaires and Surveys*, Whurr Publishers, London.

Jackson, S., 2009: *Research Methods and Statistics: Critical Thinking Approach*, Cengage learning, Belmont (USA).

Kakonge, J., 1998: EIA and good governance: issues and lessons from Africa, *Environmental Impact Assessment Review*, 18, 289-305.

Leigh, J.H. and Martin, C.R., 1987: "don't know" item non response in a telephone survey: effects of questions form and respondent characteristics, *Journal of Marketing Research*, 24, 418-424.

Mahiber, M., 2008: EIA implementation and challenges. *Proceedings of the National Workshop on EIA in Ethiopia*, Addis Ababa, April 2008.

May, T., 2001: *Social Research: Issues, Methods and Process*, Third Edition, Open University Press, Buckingham.

Modak, P. and Biswas, AK. 1999: *Conducting Environmental Impact Assessment in Developing Countries*, UN Press, New York.

Mokhehle, L. and Diab, R., 2001: Evolution of environmental impact assessment in a small developing country: a review of Lesotho case studies from 1980 to 1999, *Impact Assessment and Project Appraisal*, 19 (1), 9-18.

Momtaz, S., 2002: Environmental impact assessment in Bangladesh: A critical review, *Environmental Impact Assessment Review*, 22, 163-179.

Morgan, R., 2002: *Methodological Perspective of Environmental Impact Assessment*, Kluwer Academic Publisher, London.

Morris. P. and Therivel. R., 2001: *Methods of Environmental Impact Assessment*, Second edition, Spon press, London.

Morrison-Saunders, A. and Fischer, T., 2006: What is wrong with EIA and SEA anyway? A sceptic's perspective on sustainability assessment, *Environmental Assessment Policy and Management*, 8(1), 19-39.

Morrison-Saunders, A. and Bailey, M., 2009: appraising the role of relationships between regulators and consultants for effective EIA, *Environmental Impact Assessment Review*, 29, 284-294.

Motsamai, B., Keatimilwe, K. and Pomela, M., 2003: Environmental Impact Assessment in Lesotho in Southern African institute for environmental assessment, *Environmental Impact Assessment in Southern Africa*, Windhoek, Namibia.

Mpotokwane, M. and Keatimilwe, K., 2003: Environmental Impact Assessment in Botswana in Southern African institute for environmental assessment, *Environmental Impact Assessment in Southern Africa*, Windhoek, Namibia.

Nadeem, O. and Hameed, R., 2008: Evaluation of environmental impact assessment system in Pakistan, *Environmental Impact Assessment Review*, 28,562-571.

National Institute of Statistics of Rwanda, 2007: *Millennium Development Goal-Country Report 2007*, Government printer, Kigali.

National Institute of Statistics of Rwanda, 2008: *Rwanda Development Indicators-2006*, Government printer, Kigali.

Neuman, L.W., 2003: *Social Research Methods: Qualitative and Quantitative Approaches*, Fifth edition, Allyn and Bacon Press, Boston.

Noble, B., 2006: *Introduction to Environmental Impact Assessment*, Oxford university Press, Canada.

Ogunba, O., 2004: EIA systems in Nigeria: Evolution, current practice and shortcomings, *Environmental Impact Assessment Review*, 24, 643-660.

Opoku, S., 2001: Environmental impact Assessment in developing countries: the case study of Ghana, *Environmental Impact Assessment Review*, 21, 59-71.

Paliwal, R., 2006: EIA practice in India and its evaluation using SWOT analysis, *Environmental Impact Assessment Review*, 26, 492-510.

Pallant, J., 2005: *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using SPSS for Windows*, Second Edition, Open University Press, New York.

Peterson, R.A., 2000: *Constructing Effective Questionnaires*, Sage Publications, London.

Purnama, D., 2003: Reform of the EIA process in Indonesia: improving the role of public involvement, *Environmental Impact Assessment Review*, 23, 415-439.

Ramos T., Cecilo T. and Joanaz de Melo J., 2008: Environmental Impact Assessment in higher education and training in Portugal, *Journal of Cleaner Production*, 16; 639-645.

Retief, F. and Chabalala, B., 2009: the cost of environmental impact assessment (EIA) in South Africa, *Environmental Assessment Policy and Management*, 11 (1), 51-68.

Rossouw, N., Davies, S., Fortuin, H., Rapholo, B. and Wit, M., 2003: Environmental Impact Assessment in South Africa in Southern African Institute for Environmental Assessment, *Environmental Impact Assessment in Southern Africa*, Windhoek, Namibia.

Rwanda Development Board, 2009: *An Awareness Booklet for Compliance to Environmental Impact Assessment Procedure in Rwanda*, Government printer, Kigali.

Rwanda Development Board, 2010: *Development Drivers of Rwanda*. Available at <http://www.rwandainvest.com> accessed on 7th February 2010.

Rwanda Environmental Management Authority, 2005: *Annual Report of 2005*, Government printer, Kigali.

Rwanda Environmental Management Authority, 2006: *General Guidelines and Procedure for Environmental Impact Assessment*, Government printer, Kigali.

Rwanda Environmental Management Authority, 2008: *DEIACE Annual Report of 2008*, Government printer, Kigali.

Rwanda Environmental Management Authority, 2009: *Rwanda State of Environment and Outlook Report*, Government printer, Kigali.

Sandham, L., Siphugu, V. and Tshivhandekano, R., 2005: Aspects of environmental Impact Assessment practice in the Limpopo province-South Africa, *Ajeam-Ragee*, 10, 50-65.

Scott, D. and Oelofse, C., 2005: Social and environmental justice in South African cities: including invisible stakeholders in environmental assessment procedures, *Journal of Environmental Planning and Management*, 48 (3), 445-467.

Spong, P., Booth, V. and Walmsley, B., 2003: Environmental Impact Assessment in Zimbabwe in Southern African Institute for Environmental Assessment, *Environmental Impact Assessment in Southern Africa*, Windhoek, Namibia.

Thomas, I. and Elliot, M., 2005: *Environmental Impact Assessment in Australia: Theory and Practice*, Fourth Edition, the Federation Press, Marrickville.

United Nations Environment Programme (UNEP), 2004: *Environmental Impact Assessment and Strategic Environmental Assessment: Towards an Integrated Approach*, UNEP Printer, Geneva.

Vanclay, F., 2003: International principles for social impact assessment; *Impact Assessment and Project Appraisal*, 21 (1), 5-11.

Wang, Y., Morgan, R. and Cashmore, M., 2003: EIA of projects in the People's Republic of China: new law, old problems, *Environmental Impact Assessment Review*, 23, 543-579.

Weaver, A., 2003: Environmental Impact Assessment and Sustainable Development: key concepts and tools in Southern African Institute for Environmental Assessment, *Environmental Impact Assessment in Southern Africa*, Windhoek, Namibia.

Wilkins, H., 2003: The need for subjectivity in EIA: discourse as a tool for sustainable development, *Environmental Impact Assessment Review*, 23, 401-414.

Wood, C., 2003a: *Environmental Impact Assessment: A comparative Review*, Second edition, Prentice Press, Halltown.

Wood, C., 2003b: *Environmental Impact Assessment in Developing Countries: An Overview*, University of Manchester, Manchester.

Wood, C. and Hartley, N., 2005: Public participation in environmental impact assessment-implementing the Aarhus convention, *Environmental Impact Assessment Review*, 25, 319-340.

World Commission on Environment and Development, 1987: *Our Common Future*, Oxford University Press, New York.

Zeremariam, T.K., 2003: *An Evaluation of Environmental Impact Assessment in Eritrea*, Master's thesis, Pietermaritzburg: University of KwaZulu-Natal.

APPENDICES

APPENDIX 1: Approved list of EIA experts (MINIRENA, 2008)

REGISTRATION OF EIA EXPERTS: LIST OF INDIVIDUALS/FIRMS

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APPENDIX 2: Questionnaire

**UNIVERSITY OF KWAZULU-NATAL, WESTVILLE CAMPUS
SCHOOL OF ENVIRONMENTAL SCIENCES**

**QUESTIONNAIRE: An assessment of Environmental Impact Assessment (EIA)
procedures and challenges faced by environmental officers in EIA implementation
in Rwanda**

All responses will be treated confidentially

A. RESPONDENT'S IDENTIFICATION

1. First Name (optional):
2. Surname (optional):
3. Institution:
4. Job title:

5. What responsibilities does your current job include?
.....
.....
.....
.....
.....

B. RESPONDENT'S QUALIFICATION AND EXPERIENCE

1. What is your level of education?

Advanced level	1
Bachelor's degree	2
Post graduate diploma	3
Master's degree	4
Doctor of Philosophy (PhD)	5

2. How would you describe the relationship between what you studied and your job requirement?

Strongly related	1
Related	2
Not related	3

3. How many professional training (workshops, seminars, etc) have you attended?

None	1
1-5	2
6-10	3
11-15	4
16 and	5

4. If any, what did the training specifically involve/cover?

.....

.....

.....

.....

.....

.....

.....

5. How was those trainings related to EIA?

Strongly related	1
Related	2
Not related	3

6. How long (in years) have you been working in the current job?

>1	1
1-2	2
3-4	3
4-6	4
7 and over	5

C. RESPONDENT'S SKILLS GAPS

1. How effective are you with the following skills relevant to the EIA process?

	Strongly effective	Effective	Neutral	Ineffective	Strongly ineffective	No option
1. Computer literacy (Microsoft office Word, Excel and power point)	1	2	3	4	5	6
2. Using GIS and remote sensing software	1	2	3	4	5	6
3. Language skills (English)	1	2	3	4	5	6
4. Public participation facilitation	1	2	3	4	5	6
5. Integration of technical and social concerns in the EIA report review	1	2	3	4	5	6
6. Impact prediction and assessment	1	2	3	4	5	6
7. Mitigation measures and alternative formulation	1	2	3	4	5	6
8. Ability to review documents	1	2	3	4	5	6
9. Monitoring and evaluation skills	1	2	3	4	5	6
10. Understanding project management	1	2	3	4	5	6
11. Customer care skills	1	2	3	4	5	6

D. EFFECTIVENESS OF EIA PRACTICE IN RWANDA

1. What do you think that is the relationship between developers and their consultants generally?

Developers provide enough information and follow-up	Yes	No
Developers hire a consultant and wait for the decision without any follow-up.	Yes	No
Regular meeting with developers, consultant and authority	Yes	No
Developers do not know anything about EIA	Yes	No

2. Most of the developers submit their projects to the authority because of the following reasons (you are welcome to provide multiple responses):

To fulfill the requirements of getting loans from local banks	1
To fulfill the requirements to be financed by international funds	2
To obtain land title and building authorization from the district Authority	3
To comply voluntarily with environmental organic law	4
Others (specify)	5

3. To what extent do you agree or disagree with the following statements?

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	No option
1. Most of the terms of References of EIA studies are prepared by the authority	1	2	3	4	5	6
2. Different specialists in different domains intervene in EIA studies	1	2	3	4	5	6
3. The process of EIA report review respect the time provided by the law (10 days)	1	2	3	4	5	6
4. Impact monitoring is often carried out after project approval	1	2	3	4	5	6
5. There are adequate appeal mechanisms	1	2	3	4	5	6
6. All steps of EIA provided by the law are respected	1	2	3	4	5	6
7. Environmental audit is regularly carried out by the authority	1	2	3	4	5	6

4. Most of the EIAs are carried out at the following stage of the project (choose one).

During the planning stage of the project	1
During the implementation of the project	2
After the implementation of the project	3

5. Are Strategic Environmental Assessment (SEA) processes conducted?

Yes	No
1	2

6. If yes, what is the importance of undertaking SEAs?

.....

7. If no, why are they not conducted?

.....

8. What types of projects do you generally get involved in relation to EIAs?

.....

9. Public participation

a. Is there any public involvement in the EIA process?

Yes	No
1	2

b. If yes, at which stages of the EIA process (you are welcome to provide multiple responses)?

Screening	1
Scoping	2
Assessing and mitigation	3
Reviewing and decision-making	4
Monitoring	5

c. How is the public encouraged to participate in EIA processes?

.....

d. How effectively do you think the affected and interested people are participating in the EIA process?

Strongly effective	Effective	Neutral	Ineffective	Strongly ineffective	No option
1	2	3	4	5	6

10. Involvement of stakeholders in the EIA process.

a. Who generally are the main stakeholders you engage with and why?

.....

b. To what extent do you agree or disagree that affected and interested people are considered as stakeholders in the EIA process?

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No option
1	2	3	4	5	6

c. To what extent do you agree or disagree that a developer is considered as a stakeholder in the EIA process?

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No option
1	2	3	4	5	6

11. Policy

a. Which policies do you think impact on the EIA process in Rwanda?

.....

b. Are you familiar with the legal framework and policies (including recent changes) relating to EIAs in Rwanda?

Yes	No
1	2

b. What are the policy challenges or gaps regarding EIA?

.....

12. What do you think are the responsibilities of government in relation to EIAs?

.....

13. At what extent do you agree with the following main challenges of Environmental officers?

	Strongly Agree	Agree	Neutral	disagree	Strongly disagree	No option
1. Insufficient baseline data.	1	2	3	4	5	6
2. Shortage of staff in the department of EIA	1	2	3	4	5	6
3. Lack of adequate materials in the department	1	2	3	4	5	6
4. Lack of political will of decision makers	1	2	3	4	5	6
5. Developers consider EIA as a barrier to their projects	1	2	3	4	5	6
6. Priority of the country is development rather than environmental protection.	1	2	3	4	5	6
7. EIA being reactive rather than being proactive process	1	2	3	4	5	6
8. Inability to predict cumulative impacts	1	2	3	4	5	6
9. Decisions are not based on the environmental officer's comments.	1	2	3	4	5	6
10. Misunderstanding between environmental officers and local authorities.	1	2	3	4	5	6
11. Shortage of funding to pursue EIA	1	2	3	4	5	6
12. Lack of training for environmental officers	1	2	3	4	5	6
13. Poor environmental awareness in the country	1	2	3	4	5	6

Thank you for your cooperation!!!

APPENDIX 3: Consent letter

HUMAN SUBJECTS RESEARCH CONSENT LETTER

University of KwaZulu-Natal
Letter of Informed consent

Date: 22 June 2008

I, Mr Faustin Munyazikwiye (reg No. 209511095) a master's student registered at the University of KwaZulu-Natal. I am conducting research on "An assessment of Environmental Impact Assessment (EIA) procedures and challenges faced by environmental officers in EIA implementation in Rwanda" for my master's dissertation. I would like you to participate in the study by answering a questionnaire. The information collected will be used solely for the purposes of completing my dissertation and in future papers, journal articles and books that will be written by the researcher.

Your anonymity and confidentiality will be preserved at all times. Your personal details are required for this study and in under no circumstances will your personal details be disclosed or referenced. Furthermore, your participation is entirely voluntary and you may withdraw your permission to participate in this study without explanation at any time.

Consent Statement(s)

I agree to take part in this project. I know what I will have to do and that I can stop at any time.

Signature

Date

I thank you for your time in completing the questionnaire. If there are any questions you may contact me or my supervisor (Prof Urmilla Bob).

My contact details: (0027) 0833741136 (Cell) and Email: mufausi@yahoo.fr or 209511095@ukzn.ac.za

My Supervisor's details are: (0027) 0731330147 (Cell) and (0027) 0312607656 (work)
Email: bobu@ukzn.ac.za

Yours sincerely

Mr Faustin Munyazikwiye