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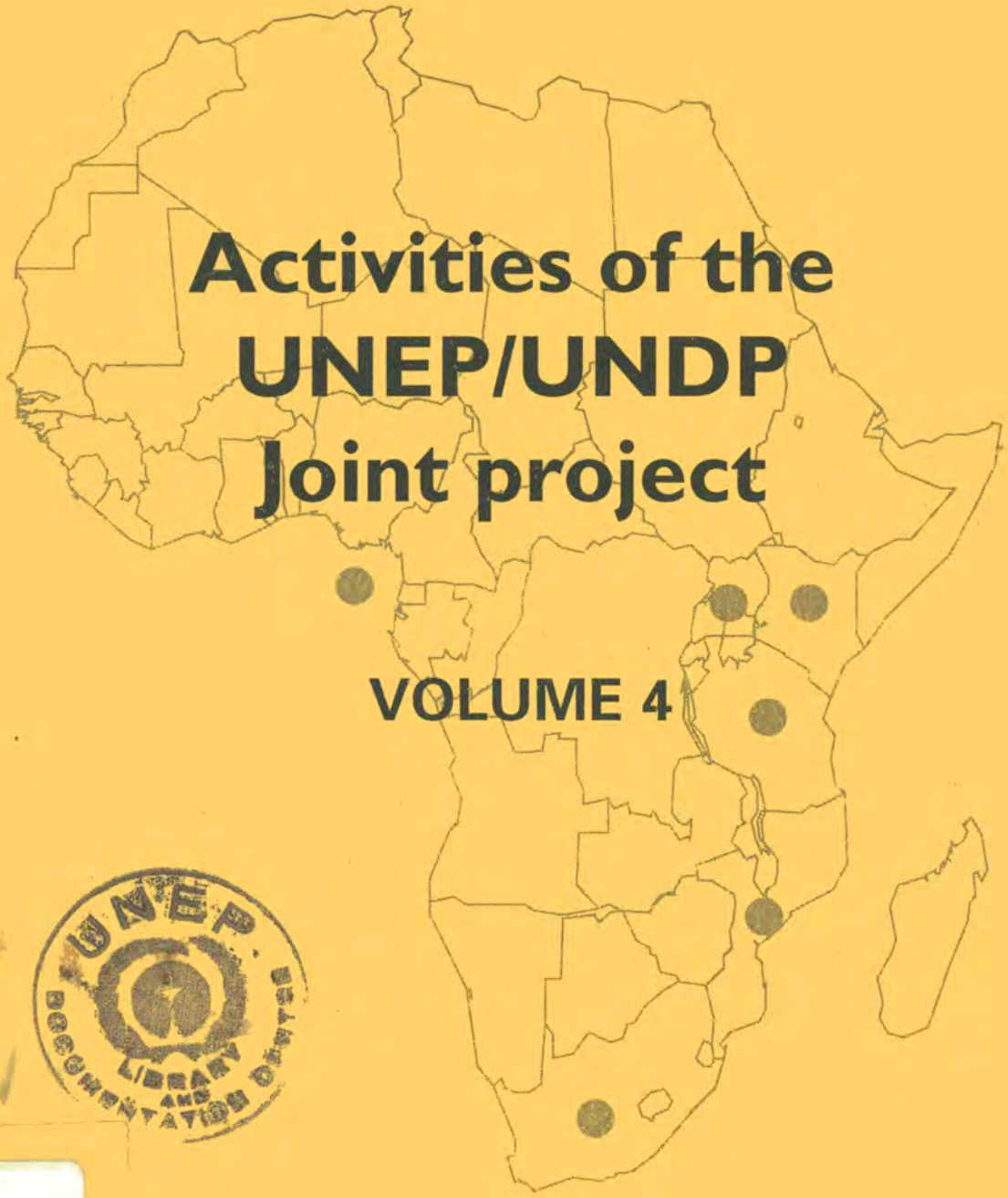

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THE REPUBLIC OF UGANDA

UNEP/UNDP ENVIRONMENTAL LAW AND INSTITUTIONS PROJECT IN AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS FOR UGANDA, 1997

Consultancy Report by:-

JOHN NTAMBIRWEKI
UNEP/UNDP LEGAL CONSULTANT

JULY, 1997

TERMS OF REFERENCE

The Terms of Reference for the Consultancy were:

1. Review all existing and/or proposed EIA laws, policies and guidelines, and institutions relating to EIA process on Uganda.
2. Review relevant international instruments having direct relevance to EIA processes.
3. Prepare a comprehensive Report on the findings of reviews.
4. Conduct extensive consultations with relevant institutions both public and private sectors with a view of soliciting for their views.
5. Prepare draft regulations on EIA for NEMA including an appropriate institutional framework or linkage, enforcement and compliance mechanism for the EIA regulatory process at National level.
6. Provide a memorandum on the training needs for staff of NEMA and others in understanding and interpreting the EIA regulations.
7. Based on the findings of the reviews, reports and draft EIA regulations, the Consultant shall present the findings and the draft regulations to a Workshop organized for that purpose by NEMA.
8. The Consultant shall based on recommendations (if any) from the Workshop incorporate the recommendations into the Report to NEMA, the task Manager of the Project and to a sub- regional meeting organized for that purpose.

9. Any other duties connected with the consultancy as may be assigned to the consultant by the National Coordinator of the project.

OUT-PUT

At the end of this consultancy, it was expected that the consultant would leave a series of recommendations and draft EIA regulations for implementation by NEMA and other relevant authorities and individuals in Uganda. The recommendations and draft regulations were to be developed in consultation with all relevant agencies and to be completed prior to the completion of the consultancy.

The Consultant submitted the final report and regulations at a workshop on EIA Regulations and they were accepted.

REVIEW OF EXISTING LEGISLATIONS ON EIA

The Consultancy took into account existing studies on environmental law and environmental management. These Studies include the following:

(1) John Ntambirweki: Environmental Legislation in Uganda: Review of Existing Legislation and Formulation of an Appropriate Legal Framework for Present and Future Environmental Management, Kampala, NEMA/IUCN 1992.

(2) "The Framework for Environmental Impact Assessment" Kampala, NEAP, 1993.

These two studies which were influential in the formulation of future legislation, found that by 1992, there was no legislative requirement for EIA in Uganda where E.I.A had been conducted. It was in most cases because of donor conditionalities especially in cases of projects financed by International financial institutions such as the World Bank, the African Development Bank and the European Development Bank. The above studies recommended that Uganda should adopt a legislative framework for EIA.

THE FRAMEWORK FOR E.I.A. IN THE NATIONAL ENVIRONMENT STATUTE

The **National Environment Statute** has followed closely the concept of EIA adopted in the UNEP Guidelines on EIA adopted by the Governing Council in 1987. These Guidelines in turn closely mirrored developments in certain national jurisdictions beginning with the USA (1969), Australia (1973), Canada (1973) New Zealand (1973) and France (1976).

The **National Environment Statute** also attempts to cover all the elements which have evolved in the four phases of the development of EIA namely: (see UNEP: EIA Training Resource Manual, Nairobi UNEP 1996 page 71).

(a) **The Initial phase (1970-1975):** In this period the basic principles and institutional arrangements for E.I.A were introduced. The principal analytical techniques were also put in place.

(b) **Late 1970's - Early 1980's:** The principal developments were to expand the scope of EIA to include social, risk, health and related factors. In the same period public participation in EIA was defined while the focus moved toward impact management.

(c) **Mid 1980's:** EIA moved into the direction of addressing Cumulative effects and integrating EIA with policy. EIA was included in planning and regulatory frameworks. The phase marked the evolution of follow up procedures such as monitoring, audit and other procedures.

(d) **Since the mid 1980's:** Under the influence of the Brundtland Commission's report, and the 1992 Rio Conference, the dominant paradigm has been how to use EIA as a tool for achieving sustainable development by increasing the importance of strategic environment assessment.

EIA is now required as a precondition for various activities under International Conventions such as the 1992 **Convention on Biological Diversity** and the 1992 **Framework Convention on Climate Change.** At the same time the United Nations Economic Commission for Europe (ECE) has developed the **EIA in a Transboundary Context Convention (1991)** which has a mandatory requirement for EIA in projects which may have transboundary environmental impacts. While the convention is not binding on Uganda, it is instructive of future trends.

DEFINITION OF EIA IN THE STATUTE AND THE CONCEPT FOLLOWED IN THE REGULATIONS

Section 2 of the **National Environment Statute** provides defines EIA as meaning:

> "a systematic examination conducted to determine whether or not a project will have any adverse impacts on the environment"

A project is defined to include projects and policies that would lead to specific projects which may have an impact on the environment.

In this regard, the definition of EIA is in accord with the concept put forward by Y.J. Ahmad and G.K. Sammy in 1987 that EIA means:

(1) A study of the effects of a proposed project on the environment,

(2) The study constitutes in the comparison of the various available alternatives in technology, design, or site and identifying which alternative represents the best combination of economic and environmental costs and benefits.

(3) The study predicts the possible environmental changes that a project could cause.

(4) The environmental effects of a project are weighed on a common yard-stick with economic costs benefits.

(See Y.J. Ahmad and G.K. Sammy: ***Guidelines to Environmental Impact Assessment in Developing Countries,*** Nairobi, UNEP, Regional Seas Reports and Studies No 85, 1987

Seen from the above, therefore, EIA is a tool for decision making which enables the decision maker to have various alternatives to choose from in developing projects. This choice ensures that decision makers take into account environmental issues in the early stages of project conception and development. EIA does not eliminate projects that have adverse impacts on the environment altogether. It only avails both the developer and the national authorities (National Environment Management Authority) the opportunity to choose development projects with full knowledge of their impacts on the environment. This enables both the developer and the Authority to develop plans and policies for the mitigation of any adverse impacts of the project on the environment.

Another point to note at the outset is that EIA is a study of possible impacts. It does not necessarily emphasise the study of negative impacts. It is a prediction of all significant impacts whether negative or positive. It is only by considering both the negative and positive impacts that the true worth of a project may be determined.

It should also be stated that what is considered positive impact today may be considered negative tomorrow depending on the state of science or public perception.

RATIONALE FOR EIA

Current trends in environmental management are emphasising the need to enhance measures that lead to the prevention of degradation of the environment and promote the conservation of natural resources. The monitoring and control of ex-post facto pollution (pollution which has already occurred) while remaining an important issue in environmental management has, nevertheless, lost pride of place to these prophylactic measures. The principal reason behind this change is the realisation that in environmental matters preventing environmental degradation is more cost-effective than repairing environmental damage which has already occurred. EIA is now recognised as one of the most effective tools in this preventive approach to environmental degradation along with long term environmental planning.

EIA makes it possible to predict through study and, therefore, with a degree of exactitude the environmental effects of a project which can be foreseen within the limits of existing scientific and social knowledge. This prediction enables the choice of those alternatives that are compatible with sustainable development and the ability of a given society to afford.

Seen in this context, therefore, EIA lies at the centre of sustainable development by encouraging the development of projects that are at home with their social and environmental surroundings which are at the same time economically viable. The need for EIA has been the subject of previous studies during the NEAP process. It, therefore, used not to be the subject of extensive justification here.

LEGAL AUTHORITY AND THE APPROPRIATE FRAMEWORK

The legislative authority of these regulations is found in sections 20,21,22 and 108 of the National Environment Statute, 1995 (See Appendix I)

Section 108 authorises the Minister on the recommendation of any Minister, the policy committee or the Board to make Regulations by statutory instrument for any matter that may be prescribed under the Statute or for giving full effect to the provisions of this statute.

CONSIDERATIONS IN DESIGNING THE EIA REGULATIONS

In designing these Regulations, the consultant had to take into account the following:

(1) <u>The National Environment Policy for Uganda 1994</u> contained valuable policy statements and directions on the appropriate system for EIA in Uganda. These statements were incorporated in the proposed Regulations where possible. In some cases, developments since 1995 dictated that the Consultant take into account contemporary trends and experiences to design the appropriate system.

(2) The NEAP process held various meetings and engaged Consultants to devise an appropriate framework for environmental impact assessment in Uganda. These recommendations were the basis for formulating the appropriate provisions of the Statute and have been taken into account in formulating these regulations. However, the statute, had one particular draw back.

It recommended many levels of assessment which were bound to cause confusion. These regulations provide a more simplified system as will be described below. Since coming into existence NEMA has also retained a consultant for the purpose of formulating guidelines of E.I.A. These guidelines were found instructive and useful. Some of the forms developed by the consultant in that consultancy have been adopted for the purposes of these regulations.

3. Uganda is a developing Country and as such it does not possess limitless financial resources for the management of the environment. Environmental Management has to compete for the scarce resources with other common goods and aspirations of society, (education, health, transport, defence and personal security, economic well being etc). This means, therefore, that the EIA framework designed must be within the means of the Country to afford and yet it should not compromise environmental security. In this regard, the framework provides for a simple three level assessment system; automatic exclusion, project brief and environmental impact study and statement. The system is also flexible by enabling the Authority to make crucial decisions on whether, when, where and how EIA and associated actions are implemented.

4. The system designed should maximise the use of available manpower resources not only in the Authority but also in the various specialised government departments and ministries, local authorities and public corporations through institutional co-ordination. The Regulations attempt to create such a system of institutional co-ordination.

LEVELS OF ASSESSMENT

The framework envisaged under the proposed Regulations has three levels of assessment for projects:-

Level 1 : Automatic Exclusion:

There exist a number of projects which may be undertaken without the need for an environmental impact assessment (e.g. constructing a house in a residential area or developing a farm in a farming area but the same activities may require an EIA if developed in a national park or forest reserve). The Third Schedule to the Statute lists all the categories of projects which require an EIA. The categories left out are automatically excluded from the EIA process unless the Authority decides otherwise. This Schedule, therefore, provided for the automatic screening of projects.

Level 2 Project Brief or Preliminary Assessment:

All projects which fall under the First Schedule require the preparation and submission to the Council of a project brief describing the project and stating its possible impacts in a preliminary report (see Regulations 4 to 9 inclusive). It is the Authority which has the mandate to either approve the project for implementation or require the developer to undertake an environmental impact study. It is hoped that many of the smaller and medium sized projects will be approved at the project brief level provided that the brief is exhaustive and indicative of the anticipated impacts.

It is anticipated that at this stage the preliminary levels of assessment provided for under the Statute, the environmental impact evaluation (IE) and environmental impact review will be covered by the Authority requiring further information depending upon the nature of the project.

Level 3: The Environmental Impact Study (EIS)

Where the project brief shows to the Authority that the project will have significant impacts on the environment then the Authority may require that an EIS be undertaken. Projects often differ in the quantum of effects, territorial extent, or significance of effects (a small project may have more adverse impacts on the environment than a large one depending inter alia on the in-puts, outputs and technology used or the location of the project). This means, therefore, that the EIS must change from project to project to take care of the specific circumstances and setting of the project.

The idea of institutionalising in the Regulations several levels of EIS was considered in the formulation of these Regulations and rejected. Instead what was accepted was that the duration, intensity and extent of each EIS should depend on the terms of reference which should be developed by developer in consultation with the Authority (see Regulation 10). This course of action ensures that there will be flexibility in EIS is that each EIS will respond to the needs of the particular project.

THE ENVIRONMENTAL IMPACT STATEMENT

At the conclusion of the environmental impact study an environmental impact statement should be made by the developer. This statement is intended to be comprehensive and informative (see Regulation 13) for two reasons. First, to enable the Authority appreciate the choice of development alternatives made by the developer and to enable it make a decision whether to approve the project or not. Secondly, the Authority may use the statement as the basis for its post-assessment environmental audit. The statement is submitted to the Authority for consideration and decision.

CREDIBILITY AND RELIABILITY OF THE STUDY AND THE STATEMENT

To ensure that the study will be conducted according to acceptable standards, the Statute and the Regulations employ a variety of mechanisms. The Authority is required to approve the names and qualifications of persons to undertake the study. These persons are required to sign the environmental impact statement before it is submitted to the Authority. These measures are intended to discourage the production of shoddy studies. It is expected that experts who are involved in this activity will ensure that work of commendable quality is produced and presented to the Authority. Shoddy work would carry the added sanction that the Authority may not certify such experts for future work.

To augment these measures, the Regulations further require that the developer in the statement disclose how the information contained therein was generated. (see Regulations 11,16 and 14 (1).

PUBLIC PARTICIPATION IN EIA

The need for public participation in EIA does not require a lengthy justification. In contemporary conditions it is a given. It is already a mandatory requirement under section 21(8)(a) of the Statute.

Democracy requires that all individuals should have a say in how their conditions of life and life chances may be affected by the actions of others. These actions may be in the political, social, cultural and economic fields. It necessarily follows that anything which changes environmental quality must be a subject for public discussion, debate and agreement. The imposition of change in environmental conditions without consultation and consent would be contrary to the generally accepted ethic of democracy.

The EIA framework as provided for in the Regulations conceives this public participation in environmental decision making at two levels. At the first level is the actual public input into the study. The public particularly those persons who would be specifically affected by the project are required to be consulted after prior advertisements of such consultations (see Regulation 12).

At the second level, public participation is provided for after submission of the EIS to the Authority. Public comments on each EIS may be invited by the Authority. Two types of public comments are envisaged. The comments of the general public entailing the recognition of the generality of environmental concerns and the unity of the environment of the Country. The comments of the section of the public which is likely to be directly or most affected by the project are also provided for specifically.

This recognises the particularity of impact and the fact that those whose lives or property are affected deserve particular attention. Where the Authority is of the view that there is need for further consultation, it may require that a public hearing be held. The Council may appoint a qualified person to conduct public the hearing. The qualifications of the person presiding at such a hearing should depend on the nature of the project and the issues in contention (see Regulations 19,20, and 22).

DECISION MAKING

These Regulations see the function of decision making at two levels which serve entirely different purposes.

Level 1: Decision Making by the Developer

The Regulations see the developer as being the person commissioning and meeting the costs of the EIA. Therefore, in the course of the EIA the developer is required to make decisions regarding the terms of reference and the hiring of the study team in consultation with the Authority, and most importantly to make a decision regarding the alternative available for project development. The latter makes sense because the developer knows the means at his disposal and is, therefore, best equipped to make this decision.

LEVEL 2: DECISION MAKING BY THE AUTHORITY

The Authority is called upon to make certain decisions as the key environmental watchdog for public policy. It determines whether or not an EIS is required and by participating in the making of terms of reference and selection of the study team, it determines the depth and extent of the study and, therefore, its results.

The Authority is also called upon to make the vital decision whether to approve the project or require the developer to redesign it taking into account environmental factors or to reject the project altogether. The total rejection of a project is a measure of last resort which should not be reverted to easily.

It should be noted here, that there exist a number of academic works which would exclude this role given to the Authority, thereby making EIA purely a business decision of the developer. To do this would be to make it less relevant in a situation where central government control and direction is still desirable as the centre stage of the national development processes. The democratisation of decision making should not necessarily exclude social engineering by government to foster progress and the protection of the environment

GROUNDS OF DECISION

Decision making within the framework for EIA under the Regulations is premised on one fundamental factor, that the decision maker (the Authority or the developer) will be guided by sound economic analysis.

The economic analysis conceived in the Regulations is one whereby both environmental social, economic and other issues are measured on the same yardstick.

The developer in choosing an alternative, will have to ensure that it is the alternative which will meet the approval of the Authority. In this way, the developer avoids the cost of redesigning the study or the cost of outright rejection. The Authority's decision is predicated on more than the economic analysis. It has to inquire into the credibility of the study and the exactitude of the predictions.

The Authority as a public watchdog must also make a decision based on the welfare of the people and long-term environmental security.

There exist a number of methodologies for economic analysis of EIA. These have been the subject of extensive literature.(see for example World Bank; Environmental Assessment Source book Vol 1 chapter 4, Washington DC, The World Bank 1991.)

The consultant did not deem it necessary to include these methodologies of analysis in the Regulations. To do so would be to limit the employment of better methods of economic analysis when they become available in future. It is hoped that the Authority will keep in constant touch with developments in economic theory in order to adapt its tools of analysis to emergent needs.

CO-ORDINATION OF GOVERNMENT DECISION MAKING

The review of the EIA, whether at the project brief level or the environmental impact statement level requires as wide a range of expertise as the projects themselves in a development situation. It is not anticipated, neither is it feasible, that at any one time the Authority will have all the necessary expertise to review each EIA. Yet it is also true that such expertise exists elsewhere in government within the specialized departments of the various ministries, the local authorities and the public corporations.

The Regulations respond to this dilemma by providing for a system of consultation between the Authority and the lead agencies (as these other agencies are styled in Section 2 and Section 7 of the Statute). The lead agency is required to make comments before the Authority approves the project brief or the EIS.

However if the lead agency fails to respond in the given time, the Authority may proceed to make a decision (see Regulation 18(3)). This latter provision is made to ensure that delays in review of EIAs do not become a bottleneck to investment decisions.

This co-ordination will ensure that the decisions of Government are harmonised and that unnecessary institutional conflicts are avoided.

DELEGATION OF EIA REVIEW FUNCTIONS

The framework which has been devised in the Statute and the Regulations envisages a wide system of environmental impact assessments covering a considerable amount of activities (see the Third schedule to the Statute). To make the system effective, it may not be possible for the Authority to perform all the review functions provided for under the Statute and the regulations. It may, in practice, be necessary for the Authority to delegate some of its functions to local authorities and to sectoral departments which have an environmental management bias.

A pre-requisite for delegation, however, is that the officers to whom functions are delegated should be trained in the techniques of analysis and review. A second issue to consider in delegation is the size or nature of the projects that will be delegated. Important projects with a great potential for affecting the environment should remain within the purview of the Authority.

TIERING OF PROJECTS

In determining whether or not EIA is required for a project, some issues constantly come up. The first of these issues relates to those projects where EIA has been conducted at the wider policy level and a specific project implementing the policy comes up . The Regulations state that such a general previous EIA should not exclude EIA on a specific project. However, the Authority in drawing up the terms of reference for EIA may exclude those aspects already covered under the general policy.

The second issue relates to similar projects. Here each project should be taken as a separate entity and an EIA required for each because nothing should be left to chance in case. The social, economic, cultural and ecological circumstances of the later project may be different (see Regulation 33).

TIME FRAMES FOR ACTIONS

The EIA involves serious business matters and an outlay of substantial sums of money. As a business matter it is necessary that EIA decisions be made in reasonable time so that delay does not unfairly penalise the developer.

The Regulations, therefore, provide specific time frames for the various actions required in the EIA review. Timely actions will ensure that the EIA process does not become a bottleneck to Uganda's investment climate.

It should be noted here that the Investment Code , 1991 provides that the Investment Authority shall issue an investor with an investment licence within seven weeks of application, with general or special incentives, (s.15, 22-28)Uganda (section 15 and 24). . In drawing up these Regulations it was found that the seven weeks time limit in the Investment Code was too short a time in which to synchronise the EIA process with the requirements of the Code [s.19(2)(d)]. The Regulations do not hinder the issuance of an investment licence under the Investment Code. The Investment Code does not relieve the investor from carrying out EIA subsequently in accordance with these Regulations. It is recommended that in practice there should be close co-operation between the National Environment Management Authority and the Uganda Investment Authority which will lead to a practice whereby EIA will be made a condition in the investment licence for appropriate projects.

PAYING FOR EIA

The Regulations put the responsibility for the EIA in the hands of the developer. It, therefore, follows that the developer bears the cost of the EIA as part of his normal business expenses. The issue which begs the question is; who pays for the review process of the EIA? This could be settled in two ways. The first option is to regard environmental management as a key public good and, therefore, require that the expense be met out of the public purse. The second option is to require that the developer defrays some of the cost of reviewing EIA.

The Regulations, while regarding the environment as a key public good nevertheless, recognise the financial constraints within which the Authority has to operate. The Regulations require that certain fees be paid by the developer to defray some of the expenses of the Authority in the review process.

TIMING OF THE EIA

The crucial question here is, when should an EIA be done? EIA should be done right at the inception of project design. If possible, it should be conducted at the same time as the economic feasibility study in order to enable both studies inform each other. It should be noted here, obviously that the economic feasibility study is a task the developer will undertake (if he wishes) to determine the economic viability of the project and is not synonymous with the EIA.

The Regulations only require the latter. Therefore, where a feasibility study is not made, the EIA should be made during the period the project is being designed.

INSTITUTIONAL ARRANGEMENTS WITHIN THE AUTHORITY FOR MANAGING EIA

To date the Authority has made a number of decisions regarding the management of EIA within its structure. The Statute establishes a technical Committee of the Board. The Regulations provide for the functions of this Technical Committee. Authority has a Technical Committee on EIA in its planning and Management Division. This is what occurs in the Authority's current organogram.

HUMAN RESOURCES FOR EIA MANAGEMENT

The proposed two man person team of experts in the Authority should be sufficient to deal with the administration of the proposed Regulations initially. This is because they will mainly co-ordinate a task into which the in-puts of the entire Authority staff are required, in addition to the in-puts of the sectoral departments. The future development of the team should depend on how the EIA functions pick up.

If the institutional co-ordination is achieved, it will be necessary to double the professional staff of the Unit. The team, due to its extensive need for correspondence, will need independent secretarial support when the Regulations come into force.

Training Needs

training needs must be seen at three levels with regard to EIA processes. At the first level, is the training of the officials in NEMA who are required to have a day to day administration in the EIA process. In this regard these officers need to be familiarised with the actual operations of a working system of impact assessment through serving internships in such organisations.

The types of organizations may be considered here;

1) National environmental organisations such as United States Environmental Protection Agency (EPA) or Britains department of Environment (DOE) or any of the other major countries with working systems where the language is English.

2) these officers could serve internships with international organisations which review EIA such as the World Bank, the African Development Bank or the European Union.

In these organisations a body of expertise and case law has already been built up which would assist with historical examples while on-going work would provide a hands-on experience.

At the second level is the training of other officers in NEMA and the lead agencies who will be involved in the review of EIAs of certain relevant projects.

In this regard, it will be necessary to organise training seminars for these officials. This training will involve:

i) workshops for line ministries, local authorities, parastatal bodies and other lead agencies.

ii) attachment of NEMA officials to observe the implementation process. IN the case of some of the more specialized departments with large-scale projects, it will be necessary to attach officers in-charge of EIA to international bodies and also operational national environmental agencies.

iii) specific training will be required for judicial officers in the process of EIA and its legal implications for the public under this comparative analysis would be made to show how other countries' judicial systems have dealt with EIA.

The third level will involve the dissemination of information about EIA to the public. This would require the printing of brochures and posters explaining to the public EIA, especially the rights each one has in relation to the EIA process.

APPENDIX II

PERSONS CONTACTED

	NAME	INSTITUTION
1.	Robert Wabunoha	NEMA
2.	Henry Aryamanya-Mugisha	"
3.	Dick Nyeko	MAAIF
4.	J.R.M. Ojok	NEMA
5.	Justin Ecaat	"
6.	Emmanuel Mukanga	"
7.	P. Buyinza	"
8.	Mai Mulendwa	MLHPP
9.	Festus Beggary	NEMA
10.	E.Kyasimiire	M Gender&CD
11.	G. Tindimwebwa	URA
12.	Ally Lugudo	Govt Chemist
13.	Jackson Twinomujuni	DWD
14.	Enoch Dribidru	"
15.	Moses Okua	MTWA
16.	Blanina Nshakira	MTWA
17.	T. Tindimanyire	Wetlands Programme
18.	J.A. Anywar	UWA
19.	F.N. Sewankambo	NEMA
20.	C. Akol	"
21.	Hope Kamusiime	UNBS
22.	C. Mugoya	UNCST
23.	Sula Kibira	NEMA

24.	F. Kabanda	Petroluem Exploration
25.	Parta Kasoma	MUIENR
26.	H. Lwabi	MOJ
27.	J.B.K. Kavuma	KARI
28.	J.V. Ramaswamy	Madhivani Group
29.	Andrew Karkimpa (Dr)	EIA TC member
30.	C.J. Okullo	MOTI
31.	C. Kanyesigye	MWSC
32.	D. Baranga	MUK
33.	Alex Muhwezi	IUCN
34.	Ray Victorine	USAID APE
35.	Keneth Kakuru	Green Watch
36.	F. Mpabulingi	NEMA
37.	Mugizi-Rwandume	KCC
38.	E. Nsajja-Mwanje	UMA
39.	Eng. Kabagambe	Water Devet Coom
40.	D. Nsalasatta	EAWLS
41.	David Mutekanga	"
42.	E. Bakibinga	MUK

LIST OF ABBREVIATIONS

1	APE	Action Programme for the Environment
2	DWD	Directorate of Water development
3	EAWLS	East African Wildlife Society
4	IUCN	World Conservation Union
5	KARI	Kawanda Research Institute
6	KCC	Kampala City Council
7	LHPP	Land Housing and Physical Planning
8	MAAIF	Ministry of Agriculture Animal Industry and Fisheries
9	MOTI	Ministry of trade and Industry
10	MTWA	Ministry of Tourism Wildlife and Antiquities
11	MUIENR	Makerere University Institute of Environment and Natural Resources
12	MUK	Makerere University
13	NEMA	National Environment Management Authority
14	NWSC	National Water and Sewerage Corporation
15	UMA	Uganda Manufacturers Association
16	UNBS	Uganda National Bureau of Standards
17	UNSCT	Uganda National Council of Science and Technology
18	URA	Uganda Revenue Authority
19	UWA	Uganda Wildlife Authority

P. O. Box 30197
NAIROBI

2nd May 1997

The Director
National Environment Secretariat
P. O. Box 67839
NAIROBI

ATTENTION: MRS JOYCE ONYANGO

Dear Madam,

RE: UNEP/UNDP Joint Project - E. A. Sub-Regional Project on Environmental Law and Institutions

Enclosed please find attached the first draft of my report on "Development and Harmonisation of EIA AND Guidelines" for descussion and comment.

As agreed kindly annex to it the Kenya National Environmental Action Plan's Report of October 1996 on "Environmental Impact Assessment (EIA) (Guidelines and Administrative Procedures)".

Yours faithfully,

DR. ALBERT MUMMA.

UNEP/UNDP JOINT PROJECT: EAST AFRICAN SUB-REGIONAL PROJECT ON ENVIRONMENTAL LAW AND INSTITUTIONS

DEVELOPMENT AND HARMONISATION OF EIA REGULATIONS AND GUIDELINES

I. INTRODUCTION

On 9th December 1996 the Director of the National Environmental Secretariat wrote appointing me to give consultancy services under the East African Sub-Regional Project on Environmental Law and Institutions. The assigned task was in the area of "The Development and Harmonisation of Environmental Impact Assessment Regulations." The Terms of Reference were to:

1. Prepare an appropriate institutional linkage, enforcement and implementation mechanism for EIA at national, regional and district level;

2. Assess existing institutional capacity within sectoral and private sector and for EIA administration;

3. Assess the need and recommend a training programme(s) to build capacity in the EIA process; and

4. Identify a framework for harmonization of EIA legislation at sub-regional level.

Subsequently, by a letter dated 13th January 1997 the Task Manager of the Project wrote, giving "general guidelines and an outline for the presentation of the consultant's report on EIA." The guidelines are, in essence, an interpretation of the above TOR. They are annexed to this Report as Annex 1. They do two things. First, they stress that the three East African project countries may have worked on various aspects of national EIA regulations and, possibly, guidelines. Therefore this consultancy is not aimed at "developing" EIA regulations and guidelines. Its aim is

the "harmonisation" of whatever may have been developed. Secondly the guidelines set out the structure within which the consultant's Report is to be presented. That structure has the following components -

1. Introduction
2. Background
3. Antecedents in Regional Harmonisation
4. Review of EIA Provisions/Typologies in the Laws
5. Draft Regulations
6. Institutional and Functional Arrangements; and
7. Training Requirements.

This Report represents the first draft of the Consultant's Report. It is prepared to meet the above TOR and Project Manager's guidelines. The draft is to be revised following discussions at the national and sub-regional level.

II BACKGROUND

1. The Origin and Functions of EIA

Environmental Impact Assessment (EIA) is essentially a technique for ensuring that environmental considerations are taken into account in any decision on development activities. In principle, EIA should apply to all actions likely to have an environmental impact. This includes policies, plans, programmes and projects. Indeed, it is in the nature of decision making that the form of action at one level is conditioned by prior action, thus limiting feasible alternatives available to subsequent decision-makers. The implementation of a project, for instance, is conditioned by the policy decisions already taken at higher levels which may have preempted some alternative strategies.

Although the benefits of undertaking an EIA are widely acknowledged, for policies, plans and programmes it remains a complex undertaking whose methodology is very much in its infancy. EIA has been undertaken, therefore, mainly at the

project level where the methodology is further advanced. Indeed, it is commonly more narrowly defined as -

> "a technique and a process by which information about the environmental effects of a project is collected, both by the developer and from other sources and taken into account by the decision-making authority in forming a judgement on whether the development should go ahead."

EIA has been in existence since 1970 when it was introduced in the USA following the coming into effect of the National Environmental Policy Act of 1969. It has rapidly spread to other parts of the world. Its use has been formalised by the introduction of national laws and regulations and, in some cases, policies which establish systems of institutionalised procedures to ensure that all proposed physical development with a potentially adverse environmental impact is assessed prior to authorisation. Those systems of linked and integrated procedures set out the rules by which -

1. individual proposed actions are subject to an EIA study;
2. such EIAs are conducted;
3. EIA results and recommendations are used in decision-making; and
4. if an authorisation is obtained, how the results are to be used to guide and assist the implementation and operation of the proposal.

The main benefits of EIA are -

1. improved project design and siting;
2. more informed decision-making;
3. increased accountability and transparency during the development process;
4. improved integration of projects into their environmental and social setting;

5. reduced environmental damage;
6. more effective projects in terms of meeting their financial and/or socio-economic objectives; and
7. a positive contribution towards achieving sustainability.

2. Structure of the EIA Process

Most EIA processes have a similar structure, with the following and in stages, as shown on the diagram annexed as Annex II:-

(i) Screening. This is an initial assessment to decide whether a project requires further investigation in an EIA. It would be time consuming and a waste of resources for all proposals to undergo an EIA. Therefore some screening is done to determine which proposals should go for screening.

Different methods exist for screening. Some designate projects or areas using threshold lists. Others use judgement or initial evaluations to determine environmental significance based on proposal type, size, cost, the sensitivity of the environment to development or the strength of community opinion. But all projects, irrespective of type, scale, thresholds or environmental sensitivity should be subjected to a screening process to determine whether or not they are likely to have serious environmental impacts. Only projects with potentially serious environmental impacts are subjected to detailed environmental assessment leading to the preparation of an EIA.

(ii) Scoping: This is a technique for identifying the key impacts requiring further investigation, and for preparing the Terms of Reference for the EIA study. Scoping should be a mandatory process and the public, affected communities and concerned authorities must be involved in the exercise.

Scoping is an activity designed to identify the key, priority and contentious issues relating to a proposed development or course of action. It forms the

basis of the EIA. It helps in focusing the assessment, thereby saving time and cost.

(iii) Terms of Reference (TOR): These are prepared by the project proponement in consultation with the Environmental Assessment Review authority. The TOR specify the following:-

(a) likely significant impacts to be identified, predicted, evaluated, mitigated and monitored;

(b) alternative designs or locations to be assessed; and

(c) work plan for EIA study and schedule of consultations.

(i) The Environmental Impact Assessment

The EIA is the identification, analysis and evaluation of the significance of impacts. It is concentrated on a systematic prediction and evaluation of the impacts identified in the TOR. It would include a prediction and evaluation of social, economic and health impacts. The study should also consider mitigative measures. These are measures to prevent, reduce or compensate for impacts and to make good environmental damage.

(v) The EIA Report. The Report presents the results of the EIA study in a useable format. It is prepared by the project proponent. Its aim is to provide the authorising agency with sufficient information to enable judgement to be made on whether to issue or refuse an authorisation.

The Report is prepared for the use of non-experts. It therefore must be written in a way which communicates effectively with its audience. It should be brief with a minimum of technical terminology, and be illustrated with good quality maps, charts, diagrams and other visual aids. The Report must also contain an executive or Non-

Technical summary which presents the main conclusions and options for decision-making.

The EIA Report should contain the following:-

- Executive or Non-Technical summary;
- An introduction;
- Descriptions of the aims of the project;
- Discussion of the relationship between the proposed project and current land-use and other relevant policies for the area likely to be affected;
- Description of the proposed project and alternatives (including no development)
- Description of the expected environmental conditions at the time of probable project implementation.
- An evaluation of the impacts of each alternative, with clear information on the criteria used to assign significance;
- Comparative evaluation of alternatives, covering significant adverse and beneficial impacts, mitigation and monitoring measures and identification of the environmentally preferred option if possible using a set of sustainability criteria;
- An Impact Management Plan;
- Discussion of the uncertainties involved in interpreting or using results from predictive methods and analytical techniques and a description of gaps in baseline and other data used in the EIA work and included in the EIA Report;
- Appendices - all technical information and description of approaches or methods used to provide conclusions in the EIA Report should be included in Appendices if not suitable for the main text. Also, Appendices should contain:

♦ a glossary;
♦ explanation of Acronyms
♦ a full list of all reference material
♦ names of the members of the EIA team
♦ TORs for the EIA

- Finally if stakeholder involvement has occurred between scoping and production of the EIA Report, a section may be added on comments received and the responses made.

(vi) The Impact Mitigation Plan

The prevention or control of impacts depends on the implementation of mitigation measures. There should be a clear, written plan of action to guide the impact management work.

The process of impact management has three basic phases -

1. implementation of mitigation measures;
2. monitoring and evaluation; and
3. revision of the Plan.

Impact management requires the following elements to be in place:

- mitigation measures;
- monitoring schemes;
- contingency plans for emergencies;
- liaison arrangements with the relevant statutory agencies and local communities;
- implementation, when considered necessary, of an appropriate environmental management audit system.

In the Plan it is useful to specify the characteristics of the mitigating measures to be implemented, in particular,

- a description of the mitigation action;
- time and place for implementation;
- expected results;
- responsibility for implementation (named individual in operator's organisation);

- monitoring strategy needed to check on implementation and level of performance success; and
- reporting procedures within operator's organisation and to a control authority and community liaison committee.

(vii) Monitoring

There are three main types of monitoring which can be undertaken for a project: compliance monitoring, mitigation monitoring (whether mitigation actions have been implemented in accordance with an agreed schedule and are working as expected, and impact monitoring (scale and extent of impacts caused by the project).

For monitoring to be successful it needs to be technically adequate and be part of an effective institutional framework which can make use of the data to take appropriate action. There is no point in collecting data which is shelved because there is no institutional arrangement within which it can be utilised.

In formulating monitoring programmes the relationship between baseline data collection and impact monitoring programmes needs to be kept in mind.

(viii) Review of EIA Reports

This is the process of assessing the adequacy of the EIA Report in terms of the existing plans, policies and standards. The authorising agency may seek outside technical expertise to assist it with the review.

If the EIA report is not acceptable technically, the agency should require additional work before it can be accepted for decision-making purposes. The revised report should then be further reviewed by the agency until it is considered acceptable.

(ix) Decision-making: this is the step when the authorising agency decides whether the proposal can proceed and, if so, under what conditions.

It is a common failing to focus all attention on the decision-making stage of the EIA process as the main or only way of ensuring an environmentally sensitive project. This stage is important, but if EIAs are undertaken throughout project life cycles then the significance of the decision-making stage may decline.

The significance of the final approval stage lies in the fact that all aspects, including the environment, are considered and trade-offs made. Because of this it is necessary to ensure that decision-makers include EIA results in their deliberations. For this, a special mechanism may be necessary.

Special mechanisms include the requirement that the decision-making body issues, publicly, an account of the decision-making process and how the EIA results were used.

(x) Stakeholder and Public Involvement

The involvement of stakeholders and the public generally is vital to the success of an EIA.

The term "stakeholders" refers to -

1. local people and communities likely to be affected by the project;
2. project beneficiaries (whether local or not);
3. national and local government agencies with responsibility for management of natural resources and welfare of the people likely to be affected by the project;
4. the interested public.

These individuals, groups and organisations represent the minimum to be involved in the EIA.

There are three main types of public involvement in EIA.

First, there is "information dissemination" which occurs when the proponent provides information to stakeholders without providing for responses from them.

"Consultation" involves information exchange between the proponent and stakeholders. Consultation gives stakeholders an opportunity to express views on the proposal. The authorising agency and the proponent are, however, not bound to take such views into account.

"Participation" indicates shared involvement and responsibility. Participation should be the aim when countries are introducing, or amending, EIA procedures.

The timing and nature of public involvement activities plays a crucial role in EIA effectiveness. In scoping, it helps to ensure that likely significant issues are identified and investigated. There are a number of basic principles to be followed when undertaking stakeholder involvement -

- sufficient information must be provided in a form which is easily understood by non-experts;
- sufficient time must be allowed for individuals to read, discuss and consider the information and its implications;
- sufficient time must be allowed to enable views and opinions to be presented;
- a response must be provided to issues raised or comments made by individuals; and
- selection and timing of venues or contexts must encourage the maximum attendance and free exchange of views.

The stages at which public involvement may occur are -

- scoping to prepare the TOR for an EIA;

- project appraisal at release of preliminary EIA report and/or the draft final EIA report;
- project implementation; and
- project evaluation.

3. Institutional Arrangements for EIA

Institutional arrangements deal with -

(a) type and effectiveness of the agency responsible for the EIA system;
(b) its relationships to focal points in government, especially sectoral or lead agencies;
(c) the mechanisms for coordination and cooperation among all agencies; and
(d) the nature and extent of involvement of actors in the EIA process.

Countries have created various kinds of institutional arrangements to promote environmental management objectives. They are of four types -

(a) adding environmental responsibilities to existing sectoral agencies, especially environment related agencies such as Ministry of Natural Resources;
(b) creating environmental departments within sectoral agencies;
(c) establishing a central environmental agency in the form of either an inter-agency committee, a subsidiary part of a ministry, or an independent body placed in the Office of the President as an integral part of national economic planning; and
(d) creating a Ministry of Environment.

It is thought that placement in a high profile Ministry with responsibility for economic planning would be the most effective arrangement.

Institutional arrangements are either centralised or decentralised. Under centralised arrangements, all the activities are concentrated in either the central environmental agency or in a lead agency. Under decentralised arrangements roles in the EIA

process are shared among either various tiers of government (hierarchical decentralisation) or among lead agencies (functional decentralisation).

Complete centralisation of EIA activities in the environmental agency is not desirable as many sectoral agencies have environmental responsibilities. EIA responsibilities should be functionally decentralised in countries with military systems of government. Environmental units should be established in each sectoral agency to assist project proponents in the processing of EIAs.

4. Procedural Frameworks for EIA

EIA procedural frameworks refer to the sequence of tasks among participants in the EIA process. They allocate responsibilities and the timing of the process. EIA can be undertaken without a set of formal procedures. However, formal procedures ensure uniformity and guarantee that all relevant projects are examined in a clearly defined structured manner so that the assessment is thoroughly executed and the results are effectively utilised. Formal procedures also eliminate inconsistencies as well as personal prejudices, whims and caprices of environmental agency or lead agency officials. Further, the absence of a defined assessment procedure creates uncertainties for project proponents regarding the actions they are expected to take.

The following are suggested as basic elements of an EIA procedure :-

1. The assessment should be conducted in two stages in order to save time and costs involved in detailed assessments. All projects, irrespective of type, scale, thresholds or environmental sensitivity should be subjected to a preliminary or initial environmental assessment or screening to determine whether or not they are likely to have serious environmental impacts. Only projects with potentially serious environmental consequences are then subjected to detailed environmental assessment leading to the preparation of an EIA;

2. Scoping should be mandatory, and the public, affected communities and concerned agencies must be involved in the exerc. .e;

3. The Terms of Reference (TOR) is to be prepared by the project proponent in consultation with the EIS Review Committee;

4. The EIA should be conducted "in-house" by the project proponent or by the use of consultants duly registered with the environmental agency;

5. The EIS should be circulated to all concerned government agencies, ensuring inter-agency cooperation;

6. There should be an opportunity for a public hearing;

7. Time limits sh ould be set for EIS reviews, ensuring that project implementation is not unduly delayed as a result of the EIA requirement;

8. In order to ensure that the development is executed in line with measures approved in the EIA, concerned agencies should be involved in monitoring compliance and post-project audits.

Effective incorporation of EIA into the project cycle can only be achieved if EIA is fully internalised as an element of the planning process. EIA should be carried out at the inception of a proposed action when there is a real choice between alternative courses of action. Therefore the EIA system should be integrated into the existing planning or development control framework of the country.

5. Constraints facing the Implementation of EIA

There are some constraints facing EIA as it is commonly administered. These relate to both the scope and the application of EIA.

The constraints relating to scope are as follows -

(a) That EIA's main focus is limited to major physical development projects with little application to national, sectoral or regional development plans;

(b) That small scale projects are not included in most EIA systems although their cumulative impact may be significant over time; and

(c) EIA is not applied to macro-economic initiatives such as structural adjustment programs or budgetary/taxation initiatives.

The constraints relating to applications are as follows -

(a) There are difficulties in ensuring adequate and useful public involvement;

(b) There is insufficient integration of EIA work with feasibility and similar studies in the project life cycle and the major decisions made before EIAs are completed;

(c) There is a lack of consistency in the selection of development projects requiring specific EIA studies;

(d) There are weak procedures for obtaining early agreement on the scope of EIA studies;

(e) There is inadequate understanding of the relative roles of baseline description and impact prediction;

(f) There is poor integration of biophysical environmental impacts with social, economic and health effects;

(g) The EIA Reports produced are not easily understood by decision-makers and the public because of their length and complexity;

(h) There is a lack of mechanisms to ensure that EIA reports are considered in authorisation decisions;

(i) There are weak linkages between the EIA Report recommendations on mitigation and monitoring and project implementation and operation; and

(j) There is limited technical and managerial capacities to implement EIAs.

(k) The Benefits of EIA tend to be long-term, diffuse and widespread whereas the costs tend to be immediate or short-term and are seen to be borne by specific proponents and organisations.

III. ANTECEDENTS IN REGIONAL HARMONIZATION

There are a number of examples of efforts at regional harmonization. The most successful are all operating in Europe. They include -

1. Recommendations by the Economic Commission for Europe (ECE) to governments for establishing EIA procedures;

2. The Espoo (Finland) Convention on environmental impact assessment in a transboundary context; and

3. The European Union Directive on the assessment of the effects of certain public and private projects on the environment (85/337/EEC).

1. The ECE Recommendations

These are as follows -

(i) That priority should be accorded to the implementation of EIA through legislation which should -

(a) In the case of separate legislation, provide for linkage with other legislation which governs, inter alia, land use planning and planning in different economic sectors, licensing and permit systems and environmental management;

(b) provide for the analysis and evaluation of possible environmental impacts of activities before a decision is taken, as well as in the construction and operation phases;

(c) Contain provisions to promote the integration of environmental considerations into planning and decision-making processes;

(d) Promote integrated environmental management in relation to sustainable economic development;

(e) Allow for the necessary resources to be allocated to the EIA process.

2. The ESPOO Convention

This Convention was agreed in Espoo, Finland on 25th February 1991 under the aegis of the United Nations Economic Commission for Europe (ECE) whose members include the European countries, Canada and the United States of America. Its aim is to enhance international cooperation in assessing environmental impact, in particular in a transboundary context. It is the only international convention on EIA, although it is not yet in effect.

The Convention imposes an obligation on State Parties, either individually or jointly, to take all appropriate and effective measures to prevent, reduce and control significant adverse transboundary environmental impact from proposed activities. Parties are required to take the necessary legal, administrative or other measures, inter alia, to establish an EIA procedure that permits public participation and preparation of stipulated environmental impact assessment documentation. The Convention lists in Appendices activities which should be subjected to EIA, and the documentation which should be prepared. The list is a list of activities likely to cause significant adverse transboundary impact.

At the initiative of any party, concerned parties shall enter into discussions on whether one or more proposed activities not listed in the Appendix is or are likely to cause a significant adverse transboundary impact and thus should be treated as if it or they were so listed. Where these parties so agree the activity or activities shall be so treated. General guidance for identifying criteria to determine significant adverse impact is set forth in an Appendix to the Convention.

The Convention requires that EIA shall, as a minimum requirement, be undertaken at the project level. It states also that parties shall endeavour to apply the principles of EIA to policies, plans and programmes.

The Convention protects the right of parties to implement national laws, regulations and administrative provisions or accepted legal practices protecting information the supply which would be prejudicial to industrial and commercial secrecy or national security. It also preserves the right of Parties to implement more stringent measures than those in the Convention.

3. The European Union Directive

This Directive introduces general principles for the assessment of environmental effects with a view to supplementing and coordinating development consent

procedures governing public and private projects likely to have a major effect on the environment.

The premise of the Directive is that principles for the assessment of environmental effects should be harmonised, in particular with reference to:-

1. the projects which should be subject to assessment;
2. the main obligations of the developers;
3. the content of the assessment.

The Directive stipulates that development consent for public and private projects which are likely to have significant effect on the environment should be granted only after a prior assessment of the likely significant environmental effects of those projects have been carried out. This assessment must be conducted on the basis of the appropriate information supplied by the developer, which may be supplemented by the authorities and by people who may be concerned by the project in question.

The Directive stipulates that projects belonging to certain types of categories have significant effect on the environment and must as a rule be subject to assessment. Other projects which may not have significant effects on the environment in every case should only be assessed where the Member States consider that their characteristics so require. For projects which are subject to assessment a certain minimum amount of information must be supplied concerning the project and its effects.

The Directive stipulates that Member States shall adopt all measures necessary to ensure that, before consent is given projects likely to have significant effects on the environment by virtue of their nature, size or location are made subject to an assessment with regard to their effects. It lists the classes of the projects in an Annex.

The Directive provides that the EIA may be integrated into the existing procedures for consent to projects in the Member States or, failing this, into other procedures or into procedures to be established to comply with the aims of the Directive.

The Directive allows Member States, in exceptional cases, to exempt a specific project in whole or in part from EIA. In that case it shall -

(a) consider whether another form of assessment would be appropriate and whether the information thus collected should be made available to the public;

(b) make available to the public the information relating to the exemption and the reasons for granting it; and

(c) inform the Commission, prior to granting consent, of the reasons justifying the exemption granted, and provide it with the information made available where appropriate, to their own nationals.

The EIA needs to identify, describe and assess the direct and indirect effects of the project on -

(a) human beings, fauna and flora;
(b) soil, water, air, climate and the landscape;
(c) the interaction between these factors; and
(d) material assets and the cultural heritage.

The Directive lists projects which must be subjected to EIA and projects which shall be assessed where Member States consider that their characteristics so require. It permits Member States to specify certain types of projects as being subject to an assessment, or to establish the criteria and/or thresholds necessary to determine which of the projects of the classes listed as subject to an assessment if Members States so decide are to be subject to mandatory EIA.

The Directive requires that in the case of projects subject to mandatory assessment Member States shall adopt measures to ensure that the developer supplies information specified in an Annex to the Directive. The information shall include at least -

(a) a description of the project comprising information on the site and design of the project;

(b) a description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects;

(c) the data required to identify and assess the main effects which the project is likely to have on the environment; and

(d) a non-technical summary of the information supplied.

Additionally, the Directive requires Member States to ensure that any authorities with relevant information make it available to the developer.

Further the Directive requires Member States to ensure that authorities likely to be concerned by the project by reason of their specific environmental responsibilities are given an opportunity to express their opinion on the request for development consent. Member States shall designate the authorities to be consulted for this purpose in general terms or in each case when the request for consent is made. The information gathered shall be forwarded to these authorities. Additionally, Member States shall ensure that -

(a) any request for development consent and any information gathered are made available to the public;

(b) the public concerned is given the opportunity to express an opinion before the project is initiated;

A second weakness was that the content of information submitted by developers has varied greatly in the absence of minimum standards; most developers submit only a bare minimum of information. The amendment introduces the concept of scoping, enabling an indication to be given of the nature of information to be gathered.

IV. REVIEW OF EIA PROVISIONS IN KENYAN LAWS

Kenya did not have any provision for EIA in its laws until the enactment of the Physical Planning Act 1996. This statute however is not yet in force.

The Physical Planning Act of 1996 is "An Act to provide for the preparation and implementation of physical development plans." It provides for the preparation of Regional Physical Development Plans and Local Physical Development Plans.

The Act empowers local authorities to control development including the power to consider all development applications and grant all development permissions." Section 30 prohibits carrying out development within the area of a local authority without development permission granted by the local authority. Section 36 provides that "if in connection with a development application a local authority is of the opinion that proposals for industrial location, dumping sites, sewerage treatment, quarries or any other development activity will have injurious impact on the environment, the applicant shall be required to submit together with the application an Environmental Impact Assessment Report."

Separately the Government is currently finalising a bill known as the Environmental Management and Coordination Bill. Among other things the Bill establishes the National Environmental Management Authority (NEMA). The functions of this authority include -

"To identify projects and programmes, plans and policies for which environmental impact assessment, environmental audit or environmental monitoring must be conducted under the Act." (Article 9(j)).

Part VII of the Bill is devoted to Environmental Impact Assessments. Article 72 provides that "notwithstanding any approval, permit or licence granted under this Act or any other law in force in Kenya, any person, before taking or financing any new project specified in the 2nd schedule, shall submit a Project Report to the Authority in the prescribed form."

The second Schedule to the Act specifies the following projects:- urban development; transportation, dams, rivers, and water resources; aerial spraying, mining, including quarrying and open cast extraction; forestry related activities; agriculture; processing and manufacturing industries; electrical infrastructure; management of hydrocarbons; waste disposal; natural conservation areas; nuclear reactors; major developments in biotechnology.

The Bill provides that the proponent shall undertake at his own expense an EIA study and submit a report to the Authority. The EIA shall be conducted in accordance with the guidelines and procedures provided for in the 4th Schedule to the Act. This provides that, the Report should contain the following:-

(i) an introduction;
(ii) a title, with a description of the project;
(iii) a description of the Project Initiator;
(iv) a statement of need for the project;
(v) a project description;
(vi) a project options description;
(vii) a description of the existing environment;
(viii) a descriptions of the results of preliminary assessment;
(ix) a detailed examination of the impacts;

(x) suggested mitigation and abatement measures;

(xi) a description of residual impacts;

(xii) an evaluation of the project;

(xiii) a summary of conclusions;

(xiv) an indication of data sources, consultations and public participation;

(xv) a list of references.

The full guidelines are annexed as Annex III to this Report.

The Bill stipulates that the Director General shall respond to applications for environmental impact assessment licences within six months. If no communication is received from the Director General within six months the applicant may within nine months of his application start his undertaking.

The Bill provides for publicity. It stipulates that upon receiving an EIA Report the Authority shall publish in the Gazette and in two daily newspapers having the largest circulation in the area, a notice which shall state -

(a) a summary description of the project;

(b) the place where the project is to be carried out;

(c) the place where the EIA Report may be inspected; and

(d) a time limit not exceeding ninety days for the submission of written comments by any Member of the public on the EIA Report. The Authority may, on the application of any person, extend the period stipulated so as to afford a reasonable opportunity for such a person to submit comments.

Article 74 provides that the Authority may, after being satisfied as to the adequacy of an EIA Report, issue an environmental impact licence on such terms and conditions as it deems fit.

Article 75 provides for the possibility of a fresh EIA. It states that the Authority may, at any time after the issue of the licence, direct the holder to submit at his expense a fresh EIA Report where -

(a) there is a substantial change or modification in the project or in the manner in which the project is being operated;

(b) the project poses an environmental threat which could not reasonably be foreseen at the time of the submission of the Report;

(c) it is established that the information or data given by the licensee in support of his application was false, inaccurate or intended to mislead.

Finally Article 78 stipulates that the Authority may cancel, revoke or suspend any EIA licence for upto 24 months where the licensee contravenes its provisions. And under Article 79 the Authority is responsible for carrying out an environmental audit of all activities that are likely to have an effect on the environment.

V. DRAFT REGULATIONS

Following the drafting of the Environmental Management and Coordination Bill the Kenya National Environmental Action Plan Secretariat (NEAP) drafted in October 1996, a Report on "Environmental Impact Assessment (EIA) (Guidelines and Administrative Procedures)."

The Report covers the following areas:-

(i) Definitions of "EIA", "project" and "environment";
(ii) Objectives of EIA;
(iii) A description of the EIA process;
(iv) The legal framework in Kenya for EIA;
(v) A description of the important considerations in EIA;

(vi) Procedures for assessment;

(vii) The EIA review process;

(viii) Guidelines for preparing EIA Reports;

(ix) EIA sector checklist.

The NEAP Guidelines notes that the application of EIA in Kenya has been on ad hoc basis due to various limitations, including:-

(i) inadequate finance and human resource capacity;

(ii) absence of comprehensive legal provisions to guide project proponents to comply with EIA requirements;

(iii) absence of comprehensive administrative procedures to ensure that EIA study recommendations are complied with and that performance standards are monitored during implementation and decommissioning;

(iv) absence of, or inadequate policies for, integrating environment and development at the planning and management levels.

In the absence of legislation EIA activities are implemented through a variety of instruments including sectoral laws, policy statements, and other administrative means, for instance, permits and licences.

The Environmental Management and Coordination Bill provides that the EIA process will take the format reproduced below as Annex IV to this Report.

The Guidelines provide a summary description of EIA procedures. The first step is for the project proponent to put in a development proposal. Secondly, the proposal is classified into one of three categories as follows -

(a) All Schedule II activities must do an EIA when it is clear from the development of the proposal that there will be significant impacts;

(b) If it is uncertain whether the proposal could result in significant impacts, an Initial Environmental Review is carried out;

(c) If no formal assessment is required an Environmental Authority Review is conducted.

The third step is the Environmental Impact Assessment itself. Before the commencement of the EIA the proponent is given the Terms of Reference by the line department in consultation with the Authority. This gives an outline of key areas of concern, methods proposed, type of data expected, the depth of investigation required and the reporting method. The Authority shall maintain a register of EIA specialists, who may be used.

The EIA study is followed by a Review Process. This is conducted by an Independent Review Panel comprised of persons from relevant disciplines and chaired by an appointee of the Director General of the Authority.

The Panel will review the EIA study for technical soundness. The Authority provides a Secretariat for it.

The EIA Report must be written in a specified format. It should have -

(a) A front cover page showing the title and project proponent;
(b) A table of contents;
(c) The project justification;
(d) The Project Description;
(e) The Project Options;
(f) A description of the project's existing environment;
(g) An indication of potential significant impacts;

(h) Mitigation measures;

(i) A monitoring and evaluation plan;

(j) Conclusions and Recommendations;

(k) Sources of Data, Consultations and public involvement;

(l) A list of references.

The Decision Stage follows the Review Process. If approval is given the conditions of approval must be reflected in the Record of Decision. One of the conditions may be a Management Plan to be followed in implementing the project. A proponent can appeal to the Environment Tribunal and/or a court of law if not satisfied with the decision.

This process is depicted in the chart annexed as Annex V to this Report.

Checklists

The final section of the Guidelines contain checklists. This provides guidance on the likely environmental impacts and possible mitigation measures that development projects in ten selected sectors may have. The checklists are to assist the agencies in doing the following:-

(i) identifying and scoping environmental implications of proposed development projects;

(ii) preparing adequate Terms of Reference;

(iii) reviewing the results of an EIA study;

(iv) determining the project's viability.

Each checklist comprises seven aspects of an EIA study:-

(i) sources of impacts;

(ii) project inputs;

(iii) project activities;

impacts;

mental impacts;

mental guidelines or standards; and

n measures.

pacts refers to elements of a project that may lead to significant
the type of project; its inputs and its activities (project siting,
peration and decommissioning).

provides information on the natural and human environments most
cted by the project impacts. They include land, water, air, flora and
habitats, wildlife, migratory routes, mineral resources, areas
nificant biodiversity, human settlements, land use, sites of historical
importance, infrastructural facilities, public health and safety and
es and values.

Impacts discusses the principal impacts on the environment:

Guidelines and Standards lists the pertinent national legislations,
d standards, and international guidelines, conventions and treaties.

asures discusses the measures necessary for the prevention or
e potential impacts and may include a Mitigation Plan. The measures
d at all stages in the project cycle, i.e. in planning, siting, designing,
n, operation, monitoring, auditing and decommissioning.

sted are Agriculture; Industry; Transport; Human Settlement and
Water Resources; Mining; Forestry; Energy; Wildlife Management and
Fisheries and Aquaculture.

VI INSTITUTIONAL AND FUNCTIONAL ARRANGEMENTS

At present there is no dedicated institutional arrangements for the management of EIA procedures in Kenya.

The institutional structure proposed in the Environmental Management and Coordination Bill is reproduced as Annex VI to this Report.

The Bill provides for the establishment of a National Environmental Council (NEC) as the policy making and coordination institution, and a National Environmental Management Authority (NEMA). The Authority is to be responsible, inter alia, for standard setting, enforcement, over-sight of EIAs and rehabilitation of degraded areas. Also to be established is an Environmental Tribunal in which decisions of the Authority may be challenged.

The NEC would be chaired by the line Minister (such as the Minister for Environment and Natural Resources). Its membership would include other line Ministers, the private sector, Non-Governmental Organisations and Universities. NEMA would be a parastatal, reporting to the Minister of Environment and Natural Resources. It would be managed by a Director General and three deputies.

The Authority's statutory functions are to be carried out through a number of specialised committees established by the Bill. Among the Authority's statutory functions is to preside over EIAs and issue environmental licences. Also, the existing provincial and district environmental committees would become a part of the Authority's committee structure.

The third component of this institutional structure is the Environmental Tribunal.

The institutional framework contained in the Bill is likely to improve vertical coordination and integration within government. The means for doing so is the District Environment Committee, which is designed to transfer decision-making to local levels. Institutional framework provides for the incorporation of the public into decision-making at all levels. The framework, finally, provides for the Authority to coordinate between the several institutions which may be involved in the EIA process.

ANNEX 1

UNEP/UNDP JOINT PROJECT:
East African Sub-Regional Project

Development and Harmonization of EIA Regulations and Guidelines

The following are general guidelines and an outline for the presentation of the consultants' report on Environmental Impact Assessment (EIA). It is suggested as a framework for reports which are eventually to be compared and possibly, harmonized. Thus, the outline presents the key features within which the various requirements in the consultant's terms of reference may be prepared.

The three countries may have worked on various aspects of national EIA Regulations and, possibly guidelines. This outline should offer a context within which such details may be explained. It is desirable that whatever has been developed within different contexts should be explained fully so that the aspects of harmonization can be discussed. It will be recalled that the possibility was clearly understood for the development of EIA to have been done through national initiatives other than this Joint Project. That is why the emphasis and focus in here is with harmonization rather than development as such.

For that reason whatever has been done on the basis of other national initiatives should be presented. It will be understood that it is not a new task performed within this Joint Project. However, the aspects which require harmonization should be identified and highlighted for discussion.

An outline which sets out the context for the presentation and eventual discussion may be as follows:

I. INTRODUCTION

This section should simply introduce the report, stating what it is all about and the sections in which it is presented.

Clear reasons should be given for why harmonization of EIA regulations and/or guidelines within East African context is desirable. That it is desirable is a settled question because the Meeting of Government Representatives said so, in February 1996.

II. BACKGROUND

This section should give the origin and function of EIA regulations and guidelines. The concept of EIA should be clearly defined. It should be clearly distinguished from Environmental risk assessment, environmental audit and environmental monitoring. Their relation as concepts applying to precaution and prudence should be clearly discussed.

In discussing the origin there should be a clear assessment of the practice in different jurisdictions in order to set the scene for subsequent explanation of what the

consultant considers as the ideal practice among the East African countries. For instance, clear distinction should be made between the practice in, say USA and Canada and, eventually what is suitable in East Africa. The place of technology, institutional framework and expertise should be explained here because they will be relevant in subsequent sections.

III. ANTECEDENTS IN REGIONAL HARMONIZATION

The ultimate interest in the Sub-Regional Project is harmonization. Therefore, after the consultant has given the background, but before settling on East African typologies, there should be discussions of any instances known to the consultant where attempts at regional harmonization has been attempted.

To start you off, the Task Manager has already sent to you the work of the Polish Environmental Law Association which discussed harmonization of EIA in Europe. The Espoo Convention which deals with EIA in Europe is also sent to you. Try to find other examples. It is suggested that you examine the precise items which are identified for harmonization and determine if they offer analogies for the East African region.

IV REVIEW OF EIA PROVISIONS/TOPOLOGIES IN THE LAWS

The consultant is to review the existing EIA laws or typologies in the laws. If there is already a proposed EIA law/regulation conduct a thorough review which also identifies the elements which are amenable to harmonization.

Assess the existing normative prescriptions and the institutional frameworks which would operate the EIA requirements and procedures. Discuss the strategies for promoting efficiency and efficacy of the law.

V DRAFT REGULATIONS

If there is already a prepared EIA Regulations, simply place it as an Annex to your report.

On the other hand, if there is none, draft one and place it as an Annex to your report.

In either case, this section should simply outline the principal features.

VI INSTITUTIONAL AND FUNCTIONAL ARRANGEMENTS

This section should present detailed institutional arrangements and linkages. It should constitute the guidelines to the EIA Regulations discussed in V above.

Outline the arrangements for enforcement and implementation mechanisms, at national level - and how the EIA objectives would be achieved at local and district levels.

Show how the foregoing national procedures could promote regional objectives in East Africa.

Identify and highlight the framework for harmonization of the institutional arrangements and procedures at the regional (EA) level.

It is presumed that this section will benefit from the indepth analysis done in sections II and III above. Therefore, the consultant is urged to seek further examples, beyond the two documents already provided.

Prepare a glossary of terms used in EIA.

VII. TRAINING REQUIREMENTS

Discussions in Section II above will have suggested the level of expertise necessary for operation of EIA regulations and guidelines. Section III will have explored the national institutional capability. The succeeding sections will have outlined what the consultant is proposing for the realization of the objectives of EIA.

All these will have suggested the scope of expertise necessary for the implementation of the regulations. Therefore, this section should provide a concise outline of the training needs as well as suitable programme for achieving it. The analysis should also summarize the type and level of technology which may be essential either from the beginning or as longterm objectives.

Procedure

The consultants should work out the schedule of work and forward it to the Task Manager through the National Coordinator.

As soon as the draft report is complete, let it also be forwarded to the Task Manager as above. A sub-regional meeting will be organized so that the three teams can discuss harmonization. But note that if any of the draft reports need further work, it will delay the other two. Therefore, it is urged that the canons of professional rigour be strictly applied. Each report which is received will be sent to the other teams for study and comparison. Adjustment in the reports may be effected immediately since the reports will have been prepared in computers.

After the sub-regional meeting then the reports will be further revised to take the comments into account. The national consensus-building seminar will then be convened.

The task will be completed only after the recommendations of the national workshop have been incorporated into the report.

ANNEX 4

GUIDELINES FOR PREPARING DETAILED ASSESSMENT REPORTS

INTRODUCTION

The introduction should give a summary of the project and should include:-

- name of the client
- project location and its regional setting
- scope of the study and aspects contained therein
- the office and person(s) conducting the study
- whether Preliminary Environmental Impact Assessment was carried out and by whom
- format

TITLE OF THE PROJECT

First, the project title should be clearly indicated on the report cover. Then, in the body of the report:-

- description of the project
- location
- size in magnitude and production
- beneficiaries or anticipated benefits
- details of the development team viz. client, Consultants, Contractor (if known) and if not mode of implementation (contracting), supervising approving agent
- whether new or expansion to an existing programme

PROJECT INITIATOR

The name of the client would be on report cover. In the body of the report, the following should be given:-

provided in light of the prevailing economic, technical, social and environmental considerations. The alternatives should detail out the costs and benefits of the project including related costs to the neighbouring local communities as a basis of evaluating the various alternatives, as well as specific necessary environmental interventions for each alternative.

DESCRIPTION OF EXISTING ENVIRONMENT

Description of existing environment should identify:-

(i) in qualitative and quantitative terms the physical environment prior to project implementation, with an indication as to whether it was in its best state or it would have required conservation intervention in the absence of the proposed project;

(ii) the spatial boundaries within which the environment has been considered, and nature and state of the immediate neighbourhood;

(ii) environmentally sensitive areas of special or unique scientific, socio-economic, cultural or ecological value etc.

RESULTS OF PRELIMINARY ASSESSMENT

At the final reports, results of preliminary assessment will be summarised in enough detail and degree of severity to highlight a comprehensive picture of the salient environmental issues.

These will include, among others:-

(i) detailed description of all the impacts

(ii) analysis of the source of impact with a clear description of the causative factors;

(iii) nature of the impacts both in the short and long run

(iv) identified possible mitigation / abatement measures.

(v) In case of impacts that are not immediately quantifiable, possible monitoring methods and processes should be given. It should also indicate the expected results after the mitigation measures have been instituted.

(vi) Areas identified and recommended for detailed assessment as well as those approved at preliminary assessment stage.

(vii) Aspects or factors that would require special consideration and immediate decisions.

DETAILED EXAMINATION ON IMPACTS

Each impact will be analysed and discussed in light of all the data and information obtained at all the stages of assessment. A progressive catalogue of the impacts identification process, including conclusions and recommendations arrived at each stage, together with factors influencing them.

The entire assessment process including methods and techniques applied will be analysed and every impact evaluated viz a viz the possible mitigation(s). This will then be referenced in the conclusion(s) and recommendation(s).

SUGGESTED MITIGATION AND ABATEMENT MEASURES

Measures that will reduce or eliminate identified or predicted potential adverse environmental impact that were incorporated in the project plan be outlined. This should include all measures considered and giving reasons why some were accepted and others rejected.

RESIDUAL IMPACTS

All data sources consulted during preliminary and/or detailed EIA studies will be clearly reported by the project proponent. Where the proponent has had to generate his data, he will report on the method(s) used.

Any consultations with specialist(s) will be quoted indicating the name of the specialist(s) and organization(s) thereof, and the data obtained. The information shall be given an appropriate acknowledgement.

The nature, extent and results of public participation in the preliminary and detailed EIA will be reported, and any written statements received from such public consultations be appended.

LIST OF REFERENCES

References made or quoted on all sources of information will be documented clearly in the EIA report.

ANNEX 5

PROPOSED EIA PROCESS

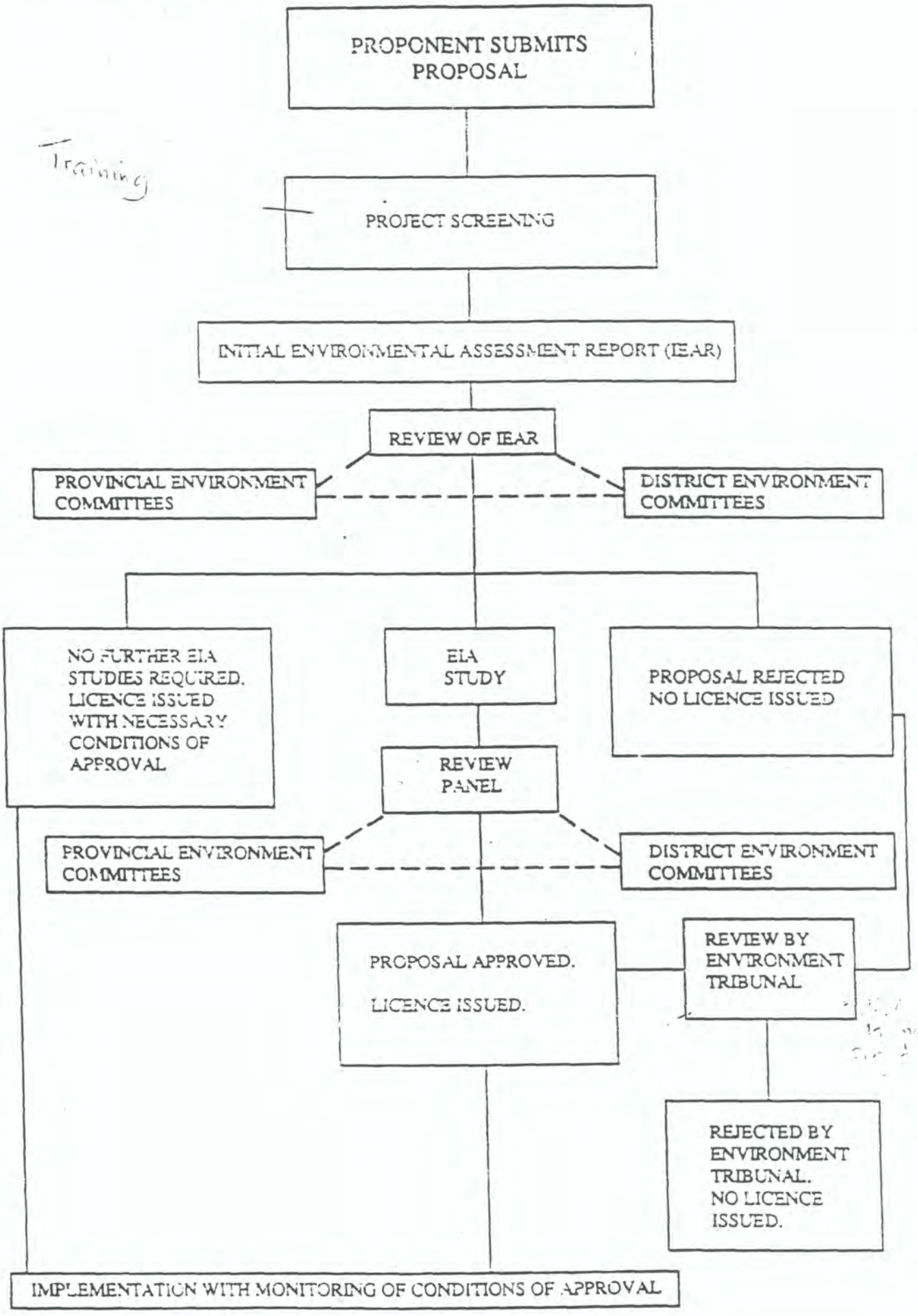
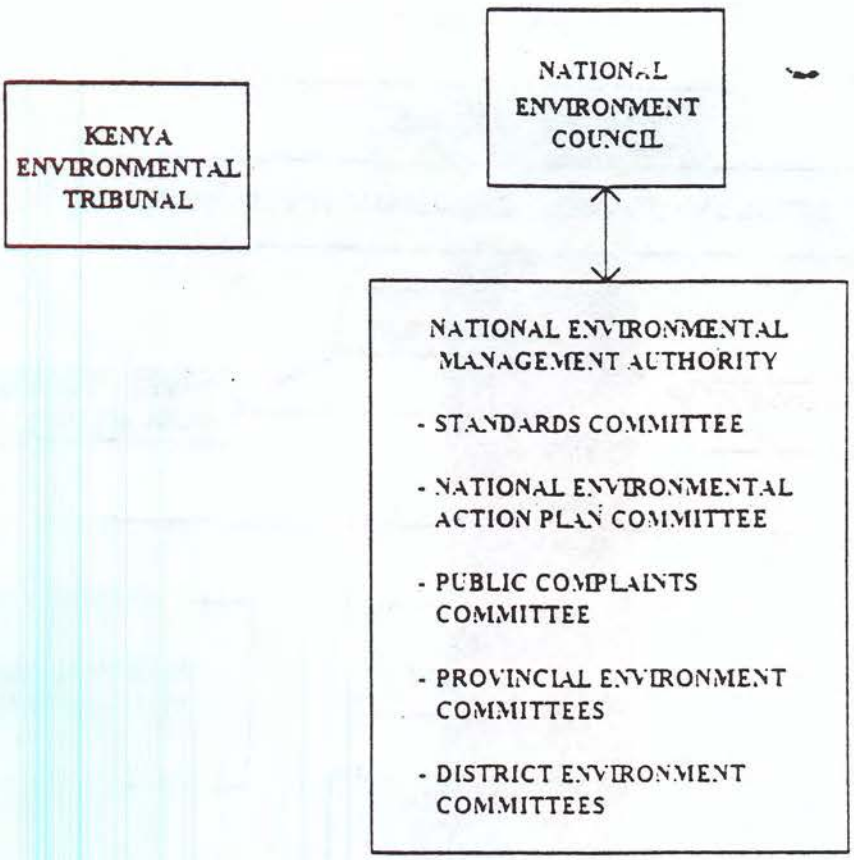


Figure 3: OPTION (2)



REPUBLIC OF KENYA

DRAFT REPORT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) (GUIDELINES AND ADMINISTRATIVE PROCEDURES)

NATIONAL ENVIRONMENT ACTION PLAN (NEAP) SECRETARIAT
MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES
P.O. BOX 30126
NAIROBI, KENYA

October, 1996

FOREWORD

The Government of Kenya has recently approved the National Policy on Environment and Development whose primary goal is sustainable development. To achieve this laudable goal, it is important to develop and implement appropriate mechanisms. One such mechanism for sustainable environmental management is the institutionalization of Environmental Impact Assessment (EIA) in our development projects and programmes.

Experience from many parts of the world has shown that many otherwise viable development projects and programmes have failed often with disastrous consequences because insufficient consideration was given to their impacts on the environment. Some became unsustainable because of limitations due to resource availability, public resentment and damage to natural resources. In this regard both the Kenya National Environment Action Plan (1994) and 8th National Development Plan recommend the establishment of an EIA system as an integral part of all development activities. Indeed, the EIA should be a requirement for development activities at all stages, from planning through to the operation stage.

In the past, EIAs have been conducted for some development proposals, usually at the initiation of funding agencies. Currently, some sectoral agencies have made EIA a requirement for their development programmes. There have also been other initiatives by the Government to develop EIA guidelines, but they lacked an institutional framework for implementation and enforcement.

The National Environment Action Plan Process initiated an ambitious programme to develop national EIA guidelines. The draft guidelines have been prepared by an intersectoral environmental committee compromising of representatives from government ministries and departments, parastatals, non-governmental organizations (NGOs), and the private sector. The Committee collected information from persons representing activities and programmes which would adequately represent a wide cross-section of national life. The observations and actual experiences of the persons were invaluable in drafting the guidelines. Indeed the intersectoral committee reflects the strong commitment of the government to involve all interested and affected parties in issues related to environment management and hence the broad-based consultation.

These draft guidelines outline the steps necessary to ensure that environmental considerations are incorporated in the project and programme planning and implementation process. The guidelines have been prepared taking into considerations the Environment Management and Co-ordination Act, the main tool for enforcing compliance.

Part 1 of the draft guidelines describes procedures for use in environmental planning and management in Kenya. The second part contains sector checklists, which would provide guidance to the public and private sector agencies responsible for development projects and programmes; they also highlight likely environmental impacts and suggest potential mitigation measures.

CHAPTER 1

OVERVIEW

1.1 INTRODUCTION

Environmental Impact Assessment (EIA) guidelines and procedures in Kenya have been developed primarily to aid environmental planning and sustainable resource use. The EIA identifies both negative and positive impacts of development activities and how they affect the people, their property and the environment. EIA, in addition identifies measures to mitigate the negative impacts, while maximising on the positive ones. EIA is essentially a preventive process which seeks to minimize adverse impacts on the environment.

Kenya has since independence pursued policies and strategies aimed at achieving reasonable levels of development for its rapidly increasing population. The policies which have guided development activities have not adequately addressed the environmental problems.

Utilization of natural resources such as soils, forests, water, and wildlife have often been unsustainable, wasteful, and environmentally damaging. Consequently, it has become necessary to develop EIA guidelines for all activities, development projects and programmes. The National Environment Action Plan (GoK, 1994), the National Policy on Environment, and the Environment Management and Coordination Bill all emphasize the need for EIA on all projects.

In the National Environment Action Plan (GoK, 1994) the Government proposes to "integrate environmental conservation in economic development to provide sustainable development for posterity. This includes, integration of environmental considerations in development planning at all levels; promotion of environmentally sound use of both renewable and non–renewable resources in the process of national development; establishment of an institutional framework for co–ordinating, monitoring, and enforcing environmental regulations and standards; and finally providing human and financial resources to support the environment and development co–ordinating agency and an EIA institution".

The application of EIA in Kenya has been on ad hoc basis due to the following limitations:

(a) Inadequate finance and human resource capacity.

(b) Absence of comprehensive legal provisions to guide project proponents to comply with EIA requirements.

(c) Absence of comprehensive administrative procedures to ensure that EIA study recommendations are complied with and that performance standards are monitored during implementation and decommissioning.

(d) Absence or inadequate policies for integrating environment and development at the planning and management levels.

1.2 DEFINITIONS

1.2.1 Environmental Impact Assessment

There is divergence of opinions on the exact concept of environmental impacts. In the developed countries, the concept refers primarily to wildlife and natural ecology. But in the developing countries the concept has different connotation because of the significance of socio–economic and ecological changes.

Generally, Environment Impact Assessment (EIA) refers to a critical examination of the effects of a project on the environment before its implementation. Impact describes any negative and positive environmental influence caused by a project. EIA is applied on the principle that the effect on the environment of the project needs to be established before it is implemented. The basic assumption is that if a proper EIA is carried out, then the safety of the environment can be properly managed during the project's implementation, commissioning, operation, and decommissioning.

1.2.2 Project

A project is defined as a specific set of human activities in a particular location and time frame and intended to achieve an objective(s).

1.2.3 Environment

The term "environment" is used in its broadest possible sense to embrace not only physical and biological systems, but also socio–economic systems and their inter–relationships.

1.3 OBJECTIVES OF EIA

The general objective of an EIA process is to ensure that environmental impacts are accounted for by all decision makers throughout the entire life–cycle of all projects and activities including planning, designing implementing, operating, and decommissioning.

1.3.1 Specific Objectives

(a) To identify the significant impacts of a project on the environment.
(b) To predict the size of changes occurring in the environment as a result of development.
(c) To evaluate the relative importance of the impacts of alternative plans.
(d) To propose mitigation measures for the significant negative impacts of the project on the environment.
(e) To generate baseline data for monitoring and evaluation of the application of mitigation measures during the implementation, operation, and decommissioning of the project.
(f) To present information on the impact of alternative development project plans.
(g) To present results of the EIA in such a way that they can guide policy makers, planners, stakeholders, and government agencies to help them understand the implications of project proposals and make the necessary decisions.

1.4 EIA PROCESS

The process of EIA requires a number of steps, including:

(a) Identify and examine alternative development plans, including demand forecasts, types of activities, processes, locations, and mitigating measures;

(b) Identify significant impacts requiring investigation;
(c) Predict the size of changes occurring in the environment as a result of development;
(d) Evaluate the relative importance of the impacts of alternative development plans;
(e) Compare alternatives; and
(f) Present information on the impacts of all project options.

1.4.1 Identification of Significant Impacts

There are two steps in identifying significant impacts, namely:

(a)Identification of all possible impacts of a development and its alternatives; and
(b)Selection of those impacts which are significant to decision making on the best alternative, and which therefore require investigation in the EIA.

1.5 LEGAL FRAMEWORK

1.5.1 Existing Legal Framework

Environmental legislation, including EIA requirements for all projects are currently being prepared by the Government. At present, EIA activities are being implemented through a variety of instruments including sectoral laws, policy statements, and other administrative means, e.g., permits and licenses.

There are 77 statutes relating to the management and conservation of the environment (Annex). Some of these laws have not been adequately enforced by the relevant authorised agencies owing to a number of reasons such as: poor or weak administrative structures, absence of provisions to specify standards of performance, inadequate deterrents, and inadequate incentives.

In the National Environment Action Plan (GoK, 1994) the Government proposes to "Review all provisions of laws relating to environment in various statutes, with a view to harmonizing, updating, and strengthening the statutes." Additionally, "review or examine laws relevant to land use in order to incorporate standards of performance, remove obsolete provisions, enhance deterrents, ensure effective implementation of provisions, provide incentives, and repeal sections that directly promote environmental destruction."

1.5.2 Environmental Policy and Legislation and the EIA

The EIA Guidelines and Procedures will provide for public review. NEMA will have the power to order for a public review at any stage of the project's screening or EIA study. NEMA will also refer the project directly to the public review before EIA study begins or at any time thereafter if and when public review will be deemed necessary.

The Environment Management and Co–ordination Act, proposes to harmonize the various statutes touching on the environment. Part VI of the bill deals with EIA, and outlines procedures for EIA application.

1.5.3 Administration Of The EIA Guidelines and Procedures

- The EIA will be administered by the National Environment Management Authority (NEMA) on behalf of minister responsible for the environment. EIA will be applicable to both public and private sector development projects and programmes.

- The projects to be subjected to EIA scheduled activities' are specified in the First schedule of section 72 (1) of the Environmental Management and Co–ordination Act. Besides the scheduled activities, the Act empowers the minister to prescribe any other activity which in his view cause significant environmental impacts.

- The NEMA will have co–ordination powers over all public and private sectors but every sector will play a role in the implementation of the EIA Guidelines. This will require establishment of Environment Liaison Units (ELU) mail use agencies. Each agencies will meet the costs of maintaining the unit.

- NEMA will designate environmental committees to oversee implementation at Provincial and District levels.

- NEMA will initiate Public participation through uses of public notices with regard to proposed EIA studies and review of reports.

- A scheduled activity will not receive the necessary authorisation from NEMA to proceed, until all EIA requirements have been fulfilled and accepted by the NEMA and the relevant line agencies.

- EIA license will be grated when NEMA and the minister are satisfied that an EIA has been satisfactorily conducted and an Environmental Management Plan of an activity has sufficiently been developed.

- All formal submissions under the EIA guidelines will be made to NEMA through the relevant line agencies. NEMA will maintain a register of all projects and programmes currently being appraised under the EIA Guidelines.

- The undertaking of all EIA and reporting will be the responsibility of the project proponents. NEMA will, on behalf of the government, provide the procedures and technical advice to project proponents on how to comply with the EIA requirements.

- The EIA studies will be carried out and reports submitted during the project feasibility study phase.

- The Environment Management and Co–ordination Act and the Environment Policy require that the Government agencies administer their respective statutes in accordance with the NEMA powers, and implement the actions enforcing the provisions of the Act. Sectors will be expected to comply with the Act to the fullest. The NEMA will ensure environment protection is a legally binding mandate of every development sector.

- NEMA will appoint individuals to an independent review panel and decide on the panel's Terms Of Reference. It will ensure that the panel has the required information before proceeding with public hearings. The panel may require further studies from proponents and prepared reports to ensure adequacy of deliberation. The panel will ensure that EIA

information is made available to the public and the hearings are covered in a manner that offers the public an opportunity to participate. The panel report will be submitted to NEMA that shall make it public.

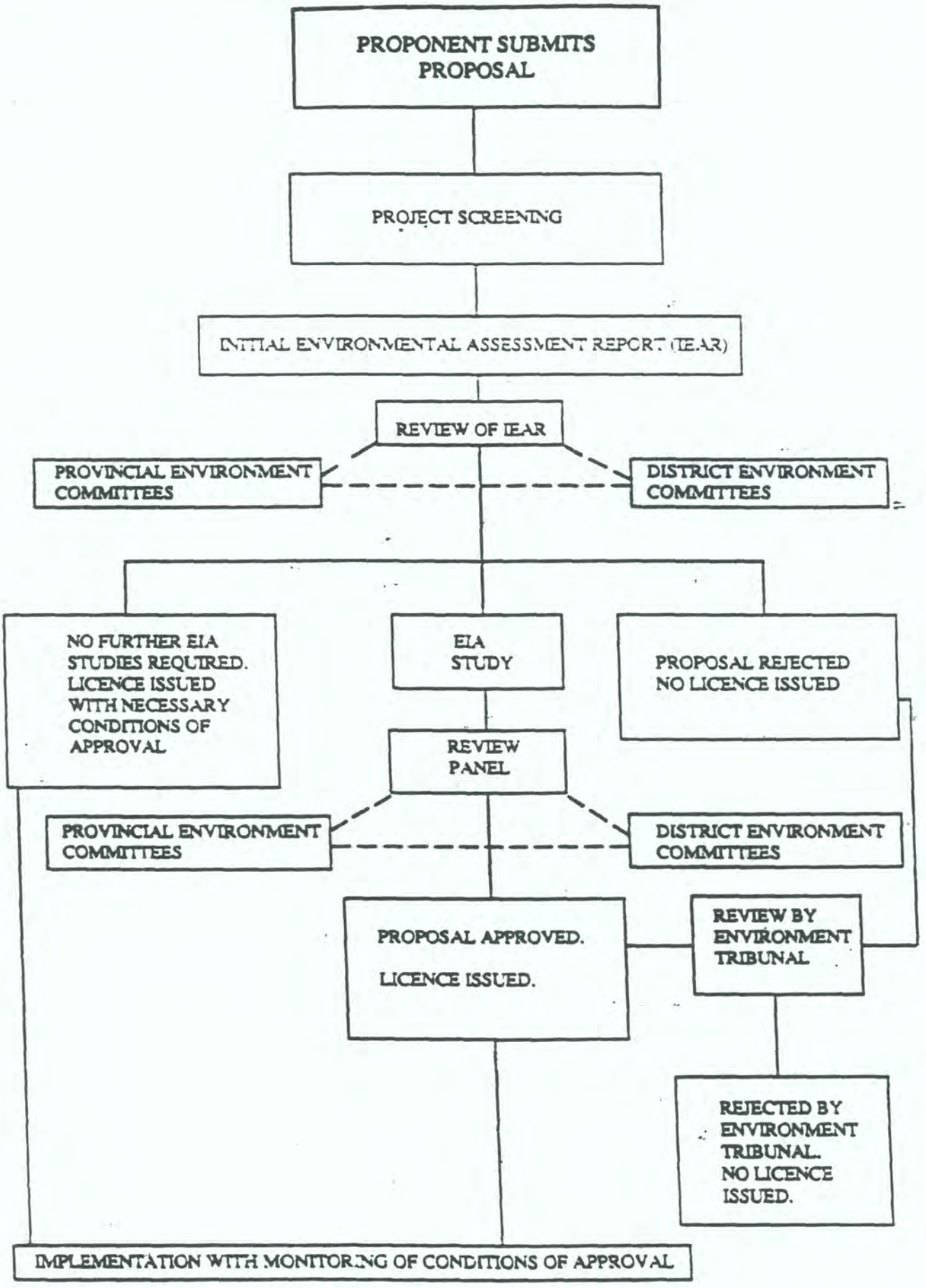
- The relevant line agencies and NEMA will ensure that all appropriate mitigation measures are implemented.

- NEMA will provide a framework for dispute resolution, this resolution will deal with the following:

  - dispute within and between Central Government departments
  - dispute between Central Government and Local Authorities
  - dispute involving the public sector, private enterprise and the general public.

- Any complains with regard to compliance with EIA requirements and procedures which NEMA may not resolve will be subject to a review by the Environment Tribunal, with provision to bring proceedings in a court of law where necessary, for judicial review by third parties including concerned citizens and/or organisations other than the Government.

PROPOSED EIA PROCESS



1.6 IMPORTANT CONSIDERATIONS IN EIA

1.6.1 Need for a Project

A project proposal must establish clearly the need for the project. Project justification should highlight the social, cultural, economic, or other benefits that will accrue from the project.

1.6.2 Project Options

An assessment of options available for a project are important considerations at the project planning stage. The environmental implications of each option should be considered before commitments are made. Project options including sitting should be assessed and eliminated. and an outline plan formulated in the project feasibility study.

An assessment should identify technical, economic, and environmental reasons for selecting a preferred option. It should include the "no project" option by providing a list of benefits which would result from the project and which would be denied if the project does not proceed.

1.6.3 Mitigating Measures

A further reason for assessment at an early stage of project planning, is to identify and to incorporate into the plan any design components or modifications which will mitigate or abate potential adverse environmental impacts. Assessors must not only identify environmental protection measures but must also seek to evaluate those measures.

1.6.4 Environmental Data Collection

Data collected is used to estimate the extent of an environmental effect and possible impact on the environment and community. Sources of information required include agencies dealing with environmental matters such as universities, research institutions, and government ministries. Additional information can often be supplemented by field data collection programmes. In principle, data collected at public expense should be made available to legitimate development project planners in both the public and private sectors. Agencies dealing in environmental matters if they are unable to provide the data required can also provide advice on environmental data that should be collected for EIA. Environmental data collection programmes must be kept within manageable proportions. Three general principles apply:

(a) Environmental data collection programmes (baseline studies included) should be based on the length of time available for the study.

(b) Inference, extrapolation, or prediction of environmental conditions and responses from base–line studies in other but similar areas may be necessary where actual data is lacking. Although such information may only be of indeterminate reliability as regards the project being evaluated, it is nevertheless often adequate for assessing impacts until such time when directly relevant data becomes available.

(c) Comprehensive, high quality data is necessary for decision–making and implementation management. However, protracted or excessive environmental data collection can be an impediment to decision–making if it confuses the decision–maker or distracts him from key environmental issues.

1.6.5 Public Participation

Public participation in environmental impact assessment procedure is an aid to project planning. It enables the project initiator to:

(a) Identify community needs and ensure that those needs are satisfied.

(b) Identify both material and psychological impacts of the project on the community.

(c) Measure and promote the social acceptance of the project in the community and avoid costly modifications or abandonment of the project at a later stage.

(d) Monitor changing environmental values in the community.

(e) Obtain additional environmental information known to the local population.

An EIA report cannot be made without some form of public participation, which should be carefully planned to obtain the maximum benefit from it.

1.6.6 Costs and Benefits in EIA

It is often not possible to place an economic value on all environmental losses or gains resulting from a development project. Consequently, decisions (project planners and project approving authorities) must take into account implied environmental values in their decisions. Therefore, EIA assessors must identify environmental impacts as well as provide information on the implied values of the environmental losses and gains. Procedural steps to meet the latter requirement are given in Sections 2.4 and 3.4.5.

1.6.7 Monitoring Environmental Impacts

Baseline studies may be initiated as part of the environmental data collection programme. Data collected should facilitate an EIA monitoring process during project implementation and operation. Monitoring are used to:

(a) Ensure that proponents meet conditions of approval.

(b) Provide feedback to improve the data base for future project planning and management.

1.7 SUMMARY DESCRIPTION OF EIA PROCEDURES

1.7.1 Objective

To assess and ensure that environmental consequences of development proposals are well understood and adequately considered in the planning and management processes of projects by both the public and private sectors.

1.7.2 Development Proposal

(a) Identify interested and affected parties;
(b) Notify interested and affected parties;
(c) Establish policy/legal and administrative requirements;
(d) Establish need for the proposal;
(e) Consult with environmental authority and others like Investment Promotion Centre

(IPC);
(f) Identify and consider alternatives;
(h) Identify and consider issues, opportunities, and constraints;
(i) Consider mitigating options;
(j) Consider management plan options.

These steps ensure that a proponent integrates the planning and assessment stages thereby expediting the process and facilitating informed decision–making.

1.7.3 Classification of Proposal

This assessment for classification is done by proponent, in consultation with the environmental authority. The proposals will go through one of three (3) routes:

(a) All scheduled activities must be subjected to EIA as spelt out in the Environment Act Schedule II, when it is clear during the development of proposal stage that there will be significant impacts.
(b) An Initial Environmental Report (IER): If it is uncertain whether the proposal could result in significant impacts, a proponent would carry out an Initial Environmental Report (IER) in consultation with environment authority.
(c) If no formal assessment is required, as the proposal meets planning requirements, and development will not result in significant impacts, an environment authority review would be required.

1.7.4 Project Screening

When the project proposal meets planning requirements as given in the guidelines, the proposal should be reviewed by a specialist and or the public. Initial assessment will be conducted, if further information is required to facilitate informed decision.

1.7.5 The Initial Environmental Assessment

If no significant impacts have been identified during the proposal development stage an initial assessment must be undertaken. The initial assessment which must be undertaken by the proponent should result in:

(a) A report is produced. If the report concludes that the proposal will result in significant impacts, then an EIA is required. The report will form background information for the scoping stage of the EIA.
(b) If however no significant impact is expected, the proponent will address all relevant questions as detailed in the guidelines, and attach the relevant specialist report that led to the finding of no significant impact.

The Environment Authority may at this stage involve a specialist and/or the public in the review. The proposal may be taken back for further investigation if the Authority is not satisfied with information so provided and is therefore unable to make an informed decision.

1.7.6 Environmental Impact Assessment

This is a must for all scheduled projects. The objectives are:

(a) To analyse the significant environmental impacts, as detailed in the proposal;
(b) To propose mitigating measures for implementation of the project; and
(c) To identify and quantity benefits of project to the community.

Details of the process include:

(a) Issuance of standard guidelines and specific terms of reference for each project;
(b) Determination of the alternatives, issues to be investigated, the procedure to be followed and reporting requirements by the proponent in consultation with the Environment Authority, Provincial and District Environmental Committees and other interested and affected parties;
(c) Investigation requirements guided by scoping decisions. and which provides the authorities with enough information on both positive and negative aspects of the proposal and possible alternatives to guide decision making;
(d) Guidelines for reporting requirements, as given by the Environmental Authority;
(e) The report writing should follow guidelines provided by the Environmental Authority.

1.7.7 Decision Stage

(a) Review Process

(i) Preview critically the detailed assessments;
(ii) Evaluate the development and environmental costs and benefits in the final project plan;
(iii) Review is conducted by an independent panel;
(iv) Approve project proposal after satisfactory completion of EIA and based on conditions of approval which must be clearly specified, including a management plan;
(v) The management plan, should describe implementation procedures, and conditions for implementation, decommissioning, and restoration.

(b) Record of Decision: Conditions of approval must be reflected in the Record of Decision. This will be made whether a proposal is approved or not.

(c) Appeal: A proponent can appeal to the Environment Tribunal and/or to a court of law if not satisfied with decision or if malpractice is suspected.

1.7.8 Implementation

(a) Proposal is implemented on approval:

The conditions of approval may require that a management plan and/or environment contract be drawn up.

(b) Monitoring of conditions of approval: According to the guidelines, what should be done, who should do it, and who should finance it. Aspects to be covered in monitoring include:

(i) Verification of impact prediction;
(ii) Appraisal of mitigation measures;
(iii) Adherence to approved plans; and
(iv) Compliance with conditions of approval.

(c) Audits:

(i) Periodic assessments of both positive and negative impacts of projects.
(ii) To serve as feedback for the adequacy of planning made at the proposal

development stage; and

(iii) Re–assess development since the implementation of the project.

CHAPTER 2

PROCEDURES FOR INITIAL ASSESSMENT

2.1 INTRODUCTION

An initial assessment is undertaken when a project has not been cleared at screening stage. The objectives of initial assessment for prescribed projects/activities are as follows:

(a) To identify the project's likely impacts on the environment;
(b) To describe and predict likely impacts;
(c) To identify and incorporate into the project plan abatement or mitigating measures; and
(d) To identify significant residual environmental impacts.

An initial assessment report is used both as a planning tool and as a mechanism of decision making. As a planning tool, the initial assessment presents methodologies and techniques for identifying, predicting, and evaluating environmental impacts of the project during the pre-feasibility stage. It is also at this stage that various alternatives will be considered and a decision made on whether or not a project should be implemented. An initial assessment is useful in early project planning, especially in selecting the most suitable site and providing warnings on serious environmental impacts of a project. This step is quite vital as it will clear projects of the need for a full EIA. In addition, an initial assessment is carried out as part of an input to the EIA assessment.

2.2 TIME FRAME

Environmental consequences of a project should be recognized early in the project cycle. At that stage, it is easier to expand, reject, or substantially modify a project proposal. On this basis, an initial assessment shall be initiated at the early stages of project planning at the pre-feasibility or project identification stage. Care should be taken to ensure that the assessment is accomplished within the work plan.

2.3 MANPOWER REQUIREMENTS

The proponent will certify that those appointed to conduct the assessment are EIA specialists as confirmed by their CVs.

2.4 IDENTIFICATION OF PROJECTS FOR INITIAL ENVIRONMENTAL IMPACT ASSESSMENT

Initial assessment shall be applied to all development projects, activities, programmes and policies shown by preliminary screening as likely to have significant environmental, social or economic impacts. Exception for initial assessment shall not exclude monitoring of projects in line with the conditions of approval. (Fig.2).

2.5 SCREENING

Screening is the first step in project proposal evaluation. Screening is used to check whether a project should undergo an initial assessment. One way to check this is to use past experience that may show the likely environmental impacts.

The exercise may take on several forms:

(a) Measuring against simple criteria such as size or location;

(b) Comparing the proposal with project types rarely needing an EIA (e.g. schools) or definitely needing one (e.g. hydro power dam);

(c) Estimating general impacts (e.g. increased infrastructure needed) and comparing these impacts against set thresholds;

(d) Analyses of available data.

2.6 THE INITIAL ASSESSMENT PROCESS

The nature and complexity of the technical, economic, and environmental aspects of a project shall determine the best approach to be used in the assessment process. At this level, sufficient research is done to identify the project's key impacts on the environment, description and prediction in general terms of the extent of the impacts, followed by an evaluation of their importance to decision makers. This initial level should be at the early project planning stage (feasibility study) in order to narrow down alternatives and also serve as an early warning on adverse environmental impacts.

2.7 INITIAL ASSESSMENT METHODOLOGY

Experience has shown that in an initial assessment, it is not necessary to use a method in its entirety, but it may be instructive to use portions of methodologies for certain activities. As in many other real life situations, no methodology can provide complete answers to all questions related to impacts. An initial assessment method is site and project specific. The project evaluation factors employed should be relevant; not too many to cause confusion or distract attention from the key issues, and not too few to be inadequate for assessment.

A specific matrix has been prepared for each scheduled prescribed activity which relates project activities to components of the physical, chemical, biological, and human environment. The matrices can be modified to suit the requirements of a particular project.

The purpose of each matrix is to help the project proponent to:

(a) Identify specific sources of potential environmental impact;

(b) Provide a means of comparing the predicted environmental impacts of various project options available;

(c) Indicate significant negative environmental impact(s) for which a design solution(s) has been identified;

(d) Indicate adverse environmental impacts that are potentially significant but about which insufficient information has been obtained to make a reliable prediction; and

(e) Indicate expected significant environmental improvement.

2.8 SCOPING

Scoping refers to the pre-study period with particular reference to identifying the following:

(a) Type of facility available for the study;
(b) Size and location of the project;

(c) Impacts to be considered on various components to the natural, social, cultural and economic environment;
(d) Methods to be applied for the preliminary assessment;
(e) Selection of alternatives and agreements on the terms of reference (TOR) for the EIA; and
(f) Type of manpower requirement.

2.9 THE BASE LINE STUDY

This study mainly focuses on the following two areas:

(a) The area where the project is to be located, and
(b) Areas outside the site of the project where further impacts are expected.

2.10 THE AD-HOC METHOD

This is a quick and effective method that compares basic characteristics of several possible alternatives for a given project.

2.11 THE CHECKLIST METHOD

These are comprehensive lists of environmental effects and impact indicators designed to stimulate the analyst to think broadly about possible consequences of the contemplated actions.

Checklists range from simple listings of environmental factors to descriptive approaches which, include information on measurements, predictions, and interpretation of changes. Scaling and weighting is used to rank impacts in order of importance and magnitude.

Impacts have spatial and temporal attributes which can occur near or far and whose effect may vary with time. Other impacts are irreversible while others are cumulative. The long term irreversible impacts are given higher weighting than short term reversible ones. Scaling and weighting takes into account the impact characteristics. (See Annex).

2.12 THE MATRIX METHOD

These are tables with the Y-axis showing the potentially affected environmental features or characteristic of the physical-chemical, biological, and human environment. The X-axis shows the project components that would have impact on the environment.

2.13 NETWORK METHOD

This is an approach for investigating and presenting higher order impacts. Its key objective is to display in an easily understood format the intermediary links between a project and its ultimate impacts.

The network permits the analyst to visualize the connection between action and impact as is best suited in a single project assessment. Network and matrices are most suited for the identification of impacts but are cumbersome in evaluating different alternatives. In addition, networks are difficult to apply requiring high skilled manpower and computers.

2.14 COST-BENEFIT ANALYSIS

The procedures for conducting economic evaluation for the best alternative requires the conversion of quantified impacts to monetary terms. Impact evaluation presents varying

degrees of deficit. Some impacts, such as construction, maintenance and operation costs are already expressed in monetary terms. Environmental impacts both positive and negative must be converted into money equivalent. All the possible alternatives including the cost of the different mitigating measures must be considered before a decision is made on the economic viability of the project.

2.15 PUBLIC PARTICIPATION

Public participation in the development of an initial environmental assessment is necessary and indeed highly desirable to ensure public support for the favoured alternatives and to ensure that no major omissions or mistakes are made in the analysis. Public participation shall be encouraged as early as possible in the EIA planning process to minimize rejection risks and also facilitate useful contribution. Public participation has the following benefits:

(a) Establish common needs and ensure that the project continues to satisfy these needs or even enhance the needs;

(b) Provide background information which forms an important part of base line data; and

(c) Create awareness in the community and sensitize it on environmental issues related to the project.

Public participation shall be achieved by the following methods: opinion surveys and barazas/workshops.

2.15.1 Public Opinion Surveys

Opinion surveys are used to reach a large or diverse community. Public opinion sampling must be carefully planned and managed to obtain valid results. This method may not be suitable for dealing with complex issues.

2.15.2 Public Barazas and Workshops

Public barazas enable people who might be affected by the project or people who might have any interest to put forward their views and debate issues openly. Workshops are good for individuals or interest groups with expert knowledge who have a genuine interest but may not like to express their opinion in public. This also avails more time for participation and tackling of issues in depth and exhaustively.

It is important to involve local communities throughout the initial stages of planning, design, and implementation of the project.

CHAPTER 3

1 INTRODUCTION

Following a satisfactory Initial Environmental Impact Assessment (IEIA), it is mandatory to carry out EIA to confirm the significance of the impacts identified.

3.2 TIME FRAME

The duration of EIA studies would depend on the nature and character of each project, including identified information gaps in the initial assessment report and the complexities of the projects. However, an assessment should be completed during the feasibility stage of the project cycle so that any mitigation plans may be incorporated in the design of the project.

3.3 MANPOWER REQUIREMENTS

The human capacity and capability requirements would depend on the project type, size and the environment condition of the project areas. The qualifications of the persons to undertake the studies would be clearly described in the Terms of Reference (TOR). For each EIA study the proponent should appoint a co–ordinator for the entire EIA study and to facilitate interaction with the Environmental Authority responsible for EIAs and the team.

The Environmental Authority will assess the quality of reports and retain a register of all persons or firms that have demonstrated competence in carrying out satisfactory EIA studies. Such a register would help the authority in providing names to any interested clients in future.

3.4 THE ASSESSMENT PROCESS

The full EIA Process will encompass all the stages of the EIA process except for the screening stage for which certain criteria will have been established for deciding what projects will mandatorily undergo EIA. Depending on the deficiencies found in the initial environmental impact assessment and any other issues that may have arisen after the review of the IEIA, a full assessment of the project/programme will be undertaken in order to provide any extra information that is required. The initial scope of the EIA as well as the TOR may be modified in order to include any new issues that may not have been covered initially. After the TORs have been defined again, the other stages of the EIA process i.e. collection of more baseline information, identification of impacts, prediction, mitigation, analysis of alternatives, monitoring and evaluation will follow for all issues not adequately addressed in the IEIA.

3.5 EIA METHODOLOGY

The following methods can be applied:

(a) Review of the existing literature;
(b) Designing of checklist or questionnaire or both;
(c) Matrices;
(d) Network;
(e) Simulation modelling;
(f) Observation and recording;
(g) Experimentation;
(h) Map overlays;
(i) Analysis in the laboratory; and
(j) Photographic technique.

The relevant method which is standard and documented by organizations like the International Commission on Irrigation and Drainage (ICID) will depend on the type of project and terms of reference.

3.6 TERMS OF REFERENCE (TOR)

Before commencement of environmental assessment, the project proponent will be given TOR by the line agency in consultation with the NEMA. This will give an outline of the key areas of concern, as identified during scoping or the initial environmental impact assessment. The method proposed, type of data expected, depth or extent of research or investigation required and the method of reporting that will be acceptable to the line agency and NEMA. The TOR will include but not limited to:

- Introduction
  - Purpose of the Terms Of Reference
  - Identification of the project to be assessed
  - Responsible party for preparing the EIA report

- **EIA Guidelines:** The general guidelines to be followed should be provided, complete with the procedure to be used in preparing the EIA report.

- **Project Background:** This will give the history of the project, the parties involved and justification of the project in terms of demand or lack of the same and the project area.

- Relevant policy and legislation should be mentioned.

- Identification of any associated projects, or any other planned within the region which may compete for the same resources.

- the project including products, by-products, processes both at implementation and operation level, resources required for successful implementation and operation of the project.

- A brief history of the project including the options considered.

- **Project Objectives:** State the objectives of the project

- **Present Environmental Condition:** Description of the project area, ecological zoning as well as the state of environment in the project area and its surrounding should be given. It should also be established whether the current environment condition is in its natural state or it had already suffered degradation. If the latter is true, the causes of the original degradation should be established and if possible, the state of the environment before the observed degradation; this could be established by:

  - researching into development activities in the project area including its surrounding;
  - Observing the physical conditions;
  - Assessing environmentally sensitive areas; and
  - Observing any special characteristics

- Observing the socio–cultural environment(population dynamics, land use, planned development activities)

- **Identification of Environmental Impacts:** In this analysis distinguish between significant positive and negative impacts, direct and indirect impacts, and immediate and long–term impacts. Identify impacts which are unavoidable and/or irreversible.

  (i) At implementation (highlight sources of environmental impacts)
  (ii) At commissioning (highlight the sources of pollution as well as by–products and their levels of toxicity)
  (iii) During operation (highlight impacts and their sources that will require monitoring during operation life of the project).
  (iv) At decommissioning stage (highlight any impacts and their sources).

- **Analysis of the Alternatives to the Proposed Project:** Describe alternatives that were examined in the course of developing the proposed project and identify other alternatives which would achieve the same objectives. The concept of alternatives extends to sitting, design, technology selection, construction techniques and phasing, and operating and maintenance procedures. Compare alternatives in terms of potential environmental impacts; capital and operating costs; suitability under local conditions; and institutional, training, and monitoring requirements. Indicate which impacts are irreversible or unavoidable and which can be mitigated. To the extent possible qualify the costs and benefits of each alternative, incorporating the estimated costs of any associated mitigation measures. The alternatives should include a no project alternative, in order to demonstrate environmental conditions without it.

- **Community:** It should also be spelt out how the affected community will be involved in the project formulation either through public barazas, questionnaires and direct interviews depending on the interest groups identified at the initial environmental impact assessment.

- **Cost Benefit Analysis:** Environmental impact assessment should also look into the economics of the project and establish its viability in terms of the expected environmental concerns and measures. Environmental costs should be treated as part and parcel of the necessary investment costs (disbenefits in case of SCBA) and not an addition. The communities' capacity to pay or shoulder the necessary cost or effect of environmental conservation measures should also be established.

- **Evaluation:** Indication should be given on how the information gathered will be evaluated to give optimum results. Required or necessary comparisons should also be spelt out and where possible areas of further investigation for continued monitoring should be identified.

- **Development of Management Plan to Mitigate Negative Impacts:** Recommend feasible and cots–effective measures to prevent or reduce significant negative impacts to acceptable levels. Estimate the impacts and the costs of those measures, and of the institutional and training requirements to implement them. Consider compensation to the affected parties for impacts which cannot be mitigated. Prepare a management plan including proposed work programmes, budget estimates, schedules, staffing and training requirements, and other necessary support services to implement the mitigation measures.

- **Development of a Monitoring Plan:** Prepare detailed plan to monitor the implementation of mitigation measures and the impacts of the project during construction and operation. Include in the plan an estimate of the capital and operating costs and a description of other inputs (such as training and institutional strengthening) needed to carry it out.

- **Inter–Agency Coordination and Public/NGO Participation:** Coordinate the environmental assessment with relevant government agencies, local NGO's and affected groups and records of meetings and other activities, communications, comments and their disposition.

In conclusion, the salient points of concern, their effects, possible mitigation measures both in the short as well as long run should be clearly spelt out. Recommendations for necessary action should be given. In addition to TOR more information needs to be supplied as follows:

(i) **Introduction to include:**

- Purpose of TOR;
- Comments on TOR; and
- Responsible party for preparing the EIA Report.

(ii) **Execution of EIA Guidelines**: General guidelines and procedure to be followed in preparation of EIA report needs to be outlined, including the following:

- Each planned task should be sufficiently described;
- A study plan incorporating a schedule for EIA should be prepared; and
- Periodic review of work during the study should be specified.

(iii) **Schedule:** specify dates for progress reviews, interim and final reports, and other significant events.

- The deadline for EIA proposals and tenders to be submitted should be stated.
- The time required for EIA report to be completed (e.g. 3–9 months) needs to be stated.

- **Personnel:** The type of expertise required for successful research and investigation should be included in the TOR. This should include area of specialization as well as experience.

- **Budget:** Budget for the EIA study should be given.

- **EIA Report Format:** The format of the report should be given e.g Executive Summary, Introduction, Project description, project options, Environment Impacts mitigation measures, conclusions, and references(see chapter 5 for details).

3.7 SCOPE OF WORK

Full EIA shall be a thorough study on the major environmental issues associated with the proposed project. In this regard and taking into account the results of IEIA, TOR shall be

drawn by the EIA coordinating authority in consultation with the project proponent, to require inter alia, that the detailed EIA shall seek and critically analyse available relevant baseline information, including environmental profiles of the area in which the proposed project will be located.

Close contact will be maintained between the project proponent and the Environmental Authority to ensure that the environmental data collection activities remain relevant. The data to be collected and analysed shall comprise the general environmental information relevant to the project and its proposed location and project specific data. The project proponent shall hence explore all avenues that would make this data available. These may include the national Environmental Authority, DDCs, line ministries, parastatal organization, NGOs, donor agencies, academic institutions, and community based organizations. The avenues may also include existing projects/programmes.

Where relevant environmental information/data is inadequate or totally lacking the project proponent shall in consultation with the national EIA coordinating authority carry out in-depth studies to establish meaningful environmental data to guide both the proponent and the Environmental Authority in the decision making process on the project. Where the Environmental Authority has reason to doubt the accuracy of the environmental data submitted by the project proponent, the authority may require further research and data from the proponent as per the TOR.

3.8 PUBLIC PARTICIPATION

EIA shall require public participation whether the proposed project is in the public or private domain. Participation will enhance sourcing of information, its analysis and appropriate interpretation. It will also improve public perception on the project, its environmental, social and economic implications, and the project options and proposed impacts mitigating measures. The public involvement at this stage may be extended beyond the affected community in the project area, to involve any member of the public that may be knowledgeable on the impacts of the project or may be better informed on environmental trends of the project area. This may require consultations with experts and interested parties.

In order to have a successful EIA, the project proponent will facilitate and ensure public participation through meetings/barazas, participatory research, and interviews. The Environmental Authority should take special active role in this area to ensure and satisfy itself that the public has been mobilised as required.

3.9 ENVIRONMENTAL COSTS - BENEFITS ANALYSIS

After the preparation of an environmental impact assessment, the review panel will evaluate the environment and development benefits and costs of a project. The details required from the assessor is the economic benefits and costs to the community and should include:

(a) Technically and financially feasible site and design options including mitigation costs and EIA cost which should be part of the investment cost;

(b) Selection of technically and financially feasible mitigation measures to abate the predicted environment impacts; and

(c) The total project plan.

The assessors may list the environmental gains and losses of a project where quantification of environmental and economic changes is not possible.

3.10 PREPARATION OF AN EIA REPORT

An assessment report would help to integrate environmental concerns in project planning. The project proponent shall bear the cost of preparation and distribution of the report. The costs should be internalised within the investment cost. The detailed assessment report should contain the following among other components:

(a) Project Impact Identification: This will involve naming all sources of impacts, e.g. smoke emissions, water consumption, construction jobs, using checklist or questionnaires. These will be matched with possible receptors of the impacts e.g. crops, communities using the same water.

(b) Prediction: The impacts on the environment and the local communities will be analysed. The analysis shall examine biological, social, economic, and physical anthropological effects of the project. The analytical process will involve use of physical, socio–cultural, mathematical, and economic models including an evaluation of costs and benefits. The models will require expert judgement for accurate predictions.

(c) Evaluation Presentation and Interpretation: The evaluation will compare impacts of different options in order to facilitate selection of the best option. This will involve determining the importance of impacts relative to one another. The presentation should include cross–tabulation diagrams, graphics and maps. The degree of severity of these impacts will be assessed in economic terms through use of techniques such as the cost benefit analysis that must take into account both qualitative and quantitative aspects.

(d) Mitigation Measures: The detailed report will identify fully the proposed measures that shall be implemented to address the identified adverse effects. Similarly, the effectiveness of these measures towards achieving desired objectives shall be assessed. A wide range of options will be proposed to prevent, reduce, remedy, or compensate for the various adverse effects.

These may include:

(i) Changing project sites, routes, processes, locations, engineering designs, raw materials, operating methods, disposal routes, timing, etc.;

(ii) Introduction of pollution control, waste treatment, monitoring, special social services, personnel training, etc.;

(iii) Compensation and restoration of damaged resources. Monetary compensations can be made to the affected persons or concessions on other issues and offsite programmes made to enhance other aspects of the environment or quality of life of the affected community.

Effective mitigation and abatement measures will be indicated to include an action plan that lends out technical control measures, an integrated management scheme, monitoring, contingency measures, operating practices, project scheduling, joint management with affected groups, cost benefits analysis, and value judgement.

(e) Monitoring and Evaluation Plan: Based on the baseline data of the EIA, a comprehensive monitoring and evaluation plan should be designed. This would be important in implementation and operation stages of project as a measure of compliance.

3.14 THE PUBLICATION OF DETAILED ASSESSMENT REPORTS

Impact assessment reports should be availed to the general public, especially to the affected and interested parties. Sufficient copies of the report will be made available to the Environment Authority and/or any other body vested with the responsibility of vetting the assessment reports. The proponent shall be responsible for providing and distributing copies of the report to relevant parties. Copies for the general public may be sold to defray costs of production and mailing of such reports. The cost and place where the report can be obtained shall be made public, through advertisement in the press, radio, Kenya Gazette, etc.

If for any reason the proponent feels/believes that an environmental impact assessment report should not be made public, he will apply to the Environment Tribunal for exemption and where the tribunal is satisfied with the reasons given for keeping the report away from public scrutiny, it will grant such exemption.

After receiving the assessment report, the NEMA shall, unless otherwise directed, let its availability be publicly known and give notice that within thirty days any comments or objection by those affected or interested be made in writing to the Authority.

CHAPTER 4

EIA REVIEW PROCESS

4.1 INTRODUCTION

4.1.1 Objectives

The review of the EIA Report will be conducted by an independent review panel comprising of persons from relevant disciplines and chaired by an appointee of the Director General. The main objectives of the review are:

(a) To critically review the EIA reports in reference to the TOR;
(b) To evaluate development and environmental costs and benefits and indicate their implications for final project plan; and
(c) To confirm the recommendations contained in the report and establish their implications for the implementation of the project.

4.1.2 Review Criteria

In reviewing the EIA Reports important issues to be addressed will include:

(a) Extent to which the EIA report covers the Terms of Reference presented at the beginning of the study;
(b) Whether the EIA report concurs with the national EIA guidelines;
(c) Extent to which key environmental issues of interest to decision makers have been addressed;
(d) Whether the findings of the report are scientifically and technically sound and organized in a manner that can easily be understood by the decision makers and the general public;
(e) Whether the study properly identified all likely significant adverse environmental impacts of the project as well as mitigation measures for the impacts;
(f) The adequacy of description of the methodology used, techniques applied, assumptions made, and limitations encountered;
(g) Whether the study has suggested reasonable alternatives to the proposed action; and
(h) The relevance of sources of information cited in the report.

4.1.3 Review Factors

The Review Panel should carefully check if the following parameters, among others, have been adequately addressed: impact identification, impact assessment, evaluation of options mitigation measures, implementation; procedures, and time frame.

(a) **Impact Identification**

(i) Does the project have an impact on any environmentally sensitive area?
(ii) Is there a clear statement of significant beneficial adverse impacts?
(iii) Have the risks been evaluated?
(iv) Has attention been paid to off-site effects, including trans-boundary effects, and to the possible time-lag before effects are manifested? and
(v) Have possible residual impacts been clearly stated?

(b) **Mitigation Measures**

(i) What mitigation measures are proposed and what alternative designs or sites have been considered?
(ii) What lessons from previous similar projects have been incorporated into this EIA?
(iii) Are there any significant impacts whose mitigation or abatement cannot be prescribed.
(iv) Have interested parties and affected communities been effectively involved?
(v) Is adequate consideration given to provision of compensation for loss of or damage to property, or for resettlement?

(c) Procedures

(i) Have the EIA procedures complied with national and sectoral guidelines, regulations, and terms of reference?
(ii) How have the beneficial and adverse effects of the project been integrated into the economic analysis of the project?

(d) **Implementation**

(i) Are institutional arrangements adequate to implement recommended mitigation measures?
(ii) Does the EIA report specify who will be responsible for the monitoring and the standards enforcement programme?
(iii) Have environmental protection measures been costed and are there funds and technical capacity to implement them?

(e) **Time Frame**

Initial assessment report review should be completed within two weeks, while EIA Report should be reviewed in one month.

4.2 THE REVIEW PANEL

This is an independent body appointed by the Director General from time to time. Its composition will be determined by the nature of the proposed project and will include persons from relevant disciplines. The panel may consult relevant experts for specialist advice on specific aspects of any project under review.

The main responsibilities of the review panel are to review EIA reports and to evaluate the environment and development costs and benefits to the community. It advises the NEMA on the EIA report recommendations concerning project implementation.

The review panel will consist of a multi–disciplinary membership including:

(a) EIA specialist
(b) Ecologists
(c) Chemist
(d) Sociologist
(e) Hydrologist
(f) Lawyer
(g) Geologist

(h) Engineer
(i) Physical planner
(j) Resource economist
(k) Environmental economist
(l) Climatologist
(m) Public health officer
(n) Agriculturalist

4.3 Secretariat to the Review Panel

The Director General will have a secretariat to facilitate the review process. Responsibilities of the Review Panel Secretariat are to:

(a) Provide full-time facilitatory service to the Review Panel;
(b) Provide standard guidelines and procedure for conducting EIA to project proponents;
(c) Assist the Review Panel in identifying experts for specialist advise, as well as obtain and compile their contributions;
(d) Undertake any informal consultations with the project proponent and the public as may be directed by the Review Panel;
(e) Review preliminary assessment reports and to determine whether or not the project shall be subjected to detailed assessment and consult the approving authority; and
(f) Perform any other duties that may be assigned by the Review Panel from time to time.

4.4 PUBLIC PARTICIPATION

Individuals and groups with legitimate interest in or affected by the projects will have unrestricted access to all formal EIA documents unless there are reasons for restriction. The Director General will publish in the Kenya Gazette and local daily newspapers a notification to the general public to inspect EIA study and Review reports. Written comments should be submitted within one month. The comments on detailed EIA reports will be taken into account by the Review Panel.

4.5 REVIEW PANEL DOCUMENTATION

The NEMA will establish a documentation unit. Both hard copies and electronic records of the following EIA and Review documents will be maintained:

(a) Guidelines and procedure for conducting EIA studies;
(b) Initial EIA reports;
(c) Comments from the public (interested and affected parties);
(d) Preliminary EIA review reports;
(e) EIA reports;
(f) Detailed EIA review reports; and
(g) Annual abstracts of EIA studies.

CHAPTER 5

GUIDELINES FOR PREPARING EIA REPORTS

Environmental assessment reports will have the following:

5.1 Front Cover Page

The following information is contained in front

a. **Title of the Project**: The project title should be clearly stated so that the type of project being proposed can easily be identified. e.g. Multipurpose Irrigation Project. The title should indicate the following:

   (i) The project's general location including its regional and national setting; and
   (ii) Phase of the project, if applicable

(b) **Project Client**: It is important that project client be clearly stated. The report should also include name of the consultant(s) or other organizations that were called upon to carry out the initial assessment [who should have experience in related field]

(c) Consultant

(d) Date

5.2 Table of Contents

This will be the entire format of the report.

(a) List of Tables

(b) List of Figures

(c) Acknowledgement/Preface

(d) Acronyms

(e) Executive Summary

(f) Chapters, which will consist of:

   (i) Introduction
   (ii) Methodology
   (iii) Presentation of baseline condition
   (iv) Actual analysis of impacts
   (v) Mitigation measures
   (vi) Conclusions and recommendations
   (vii) List of references/Consultancy/Appendixes

5.4 PROJECT JUSTIFICATION

Under the statement of need, a highlight of the proposed project's activity's background should be given. In addition, the following should be outlined:

(a) Background

(b) Reasons or justification for the proposed project;
(c) Justification should point out possible economic, social, and/or environmental benefits foreseen from the project; and
(d) A brief and clear statement of the aim for the project proposed.

5.5 Project description

The following issues should be addressed:

(a) A detailed description of a selected project option (particularly during the pre-feasibility study); or

(b) A detailed description of the project concept wherever necessary;

(c) Illustrations including maps, diagrams, and photographs should be used in describing project;

(d) A detailed description of project inputs such as raw materials, energy, infrastructure, market conditions, and other equipment should be carried out;

(e) The products and by products of the project activities; and

(f) An analysis of the economic, environmental, and technical features of the project.

5.6 PROJECT OPTIONS

In the light of the prevailing technical, economic, environmental, and other related factors, a number of available project alternatives (options) should be provided under this section. These options/alternatives should be stated in terms of their size, technology, layout, inputs (e.g. raw materials, energy and outputs/products, and even by-products).

In addition, the main principal features of each alternative option should be availed as well as possible advantages and disadvantages (such as economic, social, environmental, and technical) of each discussed and evaluated as described in chapter two.

(a) The deliberations here should also include "no project" option.

(b) This section provides an assessor with the chance of outlining any socio-economic and environmental benefits that could accrue from the project and which would be forfeited by the community should the project be abandoned or not be effectively implemented.

(c) If several location options exists, then this section should also point out this; then discuss and compare them (the methodology used to make a recommendation should be included as well).

5.7 Description of project's existing environment

Description of the projects existing environment should appropriately identify:

a) Present management practice e.g. farming systems in the area etc.
b) The spatial boundaries within which the environment has been considered;
c) The quantitative and qualitative conditions of the physical, human, and biological environments before the implementation of the project; and

(d) Environmentally sensitive areas such as those of special/unique scientific, socio–economic, and cultural value (these could be physically delineated on a map).

5.8 POTENTIAL SIGNIFICANT IMPACTS

This section of the report should identify and explain clearly positive and negative significant impacts of the proposed project. The analysis of these impacts should state, amongst others, the:

(a) Nature of the impact;
(b) Source of the impact;
(c) Nature and magnitude of the impact
(d) Unknown impacts.

5.9 MITIGATION MEASURES

The main objective is to maximize project benefits while at the same time, minimizing undesirable impacts. The discussions here should also include:

(a) Lessons from previous similar projects that have been incorporated in the EIA;
(b) How the concerned, interested, or affected populations, groups, and parties have effectively been involved in the mitigative process (both formulation and EIA);
(c) Consideration given to provision of compensation for loss or damage to property, or for resettlement, rehabilitation, or restoration;
(d) The consideration and appropriate compliance with existing national and sectoral regulations for respective projects;
(e) Whether or not the existing institutional arrangements and funding are adequate to implement recommended mitigative measures; and if not;
(f) What new suggestions have been put forward and how appropriate are they?

5.10 MONITORING AND EVALUATION PLAN

The project initiator or client should be able to describe the necessary monitoring required and design a monitoring and evaluation plan (as described in Chapter One).

5.11 CONCLUSIONS AND RECOMMENDATIONS

The conclusions drawn appropriately from all the sections highlighted above in the environmental assessment report should be summarized in a series of brief comments which refer to relevant parts of the chapter. The report should recommend further line of study, particularly, the side of residual impacts.

5.12 SOURCES OF DATA, CONSULTATIONS, AND PUBLIC INVOLVEMENT

This section will highlight and document all (individuals, agencies, institutions) consulted for information or specialist knowledge. The compilation/documentation of the above should include:

(a) Name of person and/or parent organization;
(b) Form/type of communication and date;
(c) Field data collection programmes;
(d) Form and extent of public involvement.

5.13 LIST OF REFERENCES

All publications used and quoted in the report should be appropriately listed including maps, photographs, figures, tasks, charts drawings and checklists.

PART II

ENVIRONMENT IMPACT ASSESSMENT (EIA) SECTOR CHECKLIST

INTRODUCTION

This annex presents checklists for ten specific development sectors in Kenya. The sector checklists have been tailor–made taking into account the various national development needs, the desire to preserve the diverse socio–cultural heritage, the national commitment to sustainable utilization of the natural resources in order to ensure intergenerational equity; and our national obligations to the international community.

The checklists are meant to provide guidance to the public and private sector agencies responsible for development projects and programmes, on the likely environmental impacts and their potential mitigation measures, that development projects may have in each sector. The checklists will hence assist the agencies in undertaking the following tasks:–

(i) identifying and scoping environmental implications of proposed development projects and programmes.

(ii) preparing adequate Terms of Reference (TOR) for guiding the EIA practitioners in the Environmental Impact Assessment Studies if and where they are required.

(iii) reviewing and appraising the results of an EIA report and related Environmental documents.

(iv) determining the project viability in environmental terms.

The checklists are annexed to the Environmental Impact Assessment (EIA) Guidelines and Administrative Procedures, in which definitions of the key terms and descriptions of procedures to be followed in conducting and reporting on EIA studies have been given.

Structure of Checklists

The sector checklists have a common structure. Each checklist comprises of seven recognised and definite aspects of an EIA study, namely: sources of impacts, project inputs, project activities, areas of impacts, environmental impacts, environmental guidelines/standards and mitigation measures.

The environmental impacts section, describes in general, impacts to the general and human environments. However, in some sectors, impacts to specific natural resource such as wetlands and forests have been discussed.

Sources of Impacts

Sources of impacts in these checklists refer to elements of a project or programme that may lead to significant environmental impacts. The elements include, the type of the project, its inputs and its activities, which mainly comprise project siting, construction, operation and decommissioning.

Areas of Impacts

This sub–section provides information on the natural and human environments most likely to be affected by the project impacts.

Such impact receptors may include:–

- Land

- Water
- Air
- Flora and Fauna
- Critical habitats
- Wildlife migratory routes
- Mineral resources
- Areas supporting significant biodiversity
- Human settlements
- Land use
- Sites of historical and cultural importance
- Existing infrastructural facilities
- Public health and safety
- Cultural practices and values

Environmental Impacts

While linking the impacts with the receptors, this sub–section discusses the principal environmental impacts to the natural environment. Similarly principal positive and negative socio–economic impacts are listed.

Environmental Guidelines/Standards

In order to assist in the assessment and determination of the significant environmental impacts, various international , national and local planning guidelines and regulations can be used as reference points upon which the threshold of impacts can be assessed. The pertinent national legislation, national regulations and standards, the international guidelines, conventions and treaties have been listed.

Mitigation Measures

Finally, a sub–section on measures necessary for prevention or reduction of the potential adverse impacts has been given. Mitigation measures may constitute a mitigation plan for the project impacts. These measures may be applied at all stages in the project cycle, that is, planning, sitting, designing, implementation, operation, monitoring and auditing; and at project decommissioning stage.

A Sample Checklist

As described in Part I of this document, a sample checklist of positive and negative environmental impacts of water resources development project is given in the Annex.

SECTOR CHECKLIST I

AGRICULTURE

1.1 SOURCES OF IMPACT

- Agricultural programmes and projects have the potential to lead to certain negative and positive environmental impacts. These include the following:

- Moving from shifting to settled agriculture and/or from subsistence farming to cash crop farming.
- Introduction of unfamiliar/exotic crops not previously grown in the region.
- Crop intensification programmes and crop diversification programmes with new farming systems.
- Moving from pastoral nomadic practice to sedentary agriculture.
- Introduction of mechanised farming.
- Aerial spraying (an activity).
- Soil and water management programmes.
- Irrigation.
- Livestock.
- Agro-processing (*For details refer to industry sector checklists*).
- Road programmes for improved accessibility (*For details refer to transportation sector checklists*).
- Breeding/Biotechnology.

1.2 PROJECT INPUTS

- Land (Land tenure, land suitability)
- Capital (Machinery, equipment)
- Labour
- Farm inputs (fertilizers, fumigants, pesticides, seeds and livestock
- Inputs to agro-processing (refer to industry sector)
- Genetic material

1.3 PROJECT ACTIVITIES

- Land clearing and preparation (harrowing by hand, mechanical, chemical, levelling, terracing, draining) for settlement, resettlement and pest control
- Farming Operations

  - Methods of weeding (mechanical, manual, chemical)
  - Use of fertilisers and pesticides (types, storage, methods and rate of application)
  - Mechanical farming practices (for instance, tillage, harvesting)
  - Crop and soil management practices
  - Livestock management practices
  - Crop storage

- Collection and preservation of germplasm and genetic engineering *(For details refer to forestry and fisheries)*
- Agro-processing *(For details refer to industry sector)*
- Conversion of crops and livestock to marketable products
- Use of woodfuel

1.4 AREAS OF IMPACT

The natural and human environments likely to be affected by agricultural programmes and projects include the following:

1.4.1 The Natural Environment

- Air
- Protected areas
- Areas supporting significant biodiversity e.g. the Kakamega Tropical Rain forests
- Areas supporting critical habitat e.g. wetlands and mountain ecosystems
- Environments already significantly degraded
- Sites of significant cultural or historical importance e.g. Kaya forests
- Terrestrial or aquatic flora and fauna
- Soil
- Surface and ground water (quality, flow regimes)
- Fragile ecosystems (e.g. Arid and Semi Arid Lands (ASAL) and Wetlands)

1.4.2 The Human Environment

- Human settlements in proximity to the project
- Human population
- Existing land-use to be displaced/converted (e.g. forestry reserves, and recreational areas
- Existing provisions of goods and services (e.g. health, agricultural extension services, investment capital and education)
- Land tenure system
- Labour market, division of labour and labour availability for food production
- Security of livelihoods/cash income generation
- Traditional livelihoods (e.g. pastoralism, fishing and indigenous knowledge)
- Public health issues
- Gender issues
- Squatters

1.5 ENVIRONMENTAL IMPACTS

The following are some of the potential environmental impacts arising from agricultural programmes and projects.

1.5.1 General Impacts on Natural Environments

- Loss of vegetation cover
- Destruction of wildlife habitat
- Loss of biodiversity
- Soil erosion
- Desertification
- Increased climate variability/climate change
- Change and loss of aesthetic value
- Pollution (soil, water and air)
- Changes in hydrology
- Salinization
- Water logging
- Damage to historical artifacts and landforms
- Water use conflicts
- Accumulation of non-degradable material
- Eutrophication

1.5.2 Specific Impacts on Natural Environment

- ***Impacts of wetlands***

  - Loss of habitat and biodiversity
  - Loss of functional goods and services produced by wetlands
  - Drainage of wetlands reduces fisheries production, ground water recharge, river base flows and water supplies
  - Mangrove clearing causes adverse impacts on estuarine fisheries, reduction in wildlife habitats, loss of a natural barrier against flooding and erosion, and salt intrusion

- ***Impacts on Forests***

  - Destruction of wildlife habitats and loss of biodiversity
  - Disturbance of the hydrological regimes
  - Logging operations and access roads cause increased run-off, siltation of water course, water bodies and man-made reservoirs, reduction in water supply and quality
  - Physical damage to historical artifacts, landforms and cultural sites
  - Changes to the micro and meso-climates (e.g. temperature and precipitation)

1.5.3 Impacts on Human Environment

- Generation of employment opportunities
- Contribution towards the attainment of food security and nutrition
- Provision of raw materials for industry
- Strengthening of local economy and linkages
- Generation of Cow dung for biogas production, making houses and farm manure
- Safe disposal of crop residues through stall feeding of livestock

- Provision of infrastructure
- Loss of use of traditional forest products
- Loss of farm labour to cash crop agriculture
- Social conflicts of local population with new farmers
- Social conflicts within local population due to increased wealth differentials
- Increased land values and rents for vulnerable
- Increased poverty due to change in landuse and land tenure
- Dependence on cash crops to the exclusion of subsistence crops leading to malnutrition
- Increased incidence of water borne diseases
- Women and children's livelihoods and status adversely affected (e.g. agricultural projects increasing burdens without providing additional assets or income)
- Spread of pests and diseases.
- Loss of disease resistant to humans, crops and animals Public health and safety
- Increased foreign exchange earnings

1.6 ENVIRONMENTAL GUIDELINES/STANDARDS

Environmental guidelines and standards in the agricultural sector are meant to assist the EIA agency, project proponent, EIA practitioners and other interested parties in determining the significance of environmental impacts. They are a reference point upon which the threshold of impacts can be assessed. The pertinent guidelines/standards governing environmental quality with respect to agriculture activities

include the following:

National Legislation

- Agriculture Act, Cap. 318
- Crop Production and Livestock Development Act, Cap. 321
- Irrigation Act, Cap. 347
- Land Control Act, Cap. 302
- The Government Lands Act, Cap. 280
- The Wildlife Conservation and Management Act, Cap. 376
- The Forest Act, Cap. 385
- The Fisheries Act No. 5 of 1989
- The Plant Protection Act, Cap. 324
- The Seed and Plant Varieties Act, Cap. 326
- Suppression of Noxious Weeds Act, Cap. 325
- Coconut Preservation Act, Cap. 332
- Science and Technology Act, Cap. 250
- National Museums Act, Cap. 216
- The Water Act, Cap. 372
- Lakes and Rivers Act, Cap. 409
- The Public Health Act, Cap. 242

- Fertilisers and Animal Foodstuffs Act, Cap. 345
- Radiation Protection Act, Cap. 243
- Pest Control Product Act, Cap. 346
- National Drinking Water Standards*a
- National Effluent (Waste water) Discharge Standards*b
- The Clean Air Act*c
- Air Quality Standards*d

*a The Standards are being formulated
*b The Standards should be formulated
*c The Clean Air Act is yet to be enacted
*d The Air Quality Standards are yet to be formulated
* The Environmental Management and Coordination Act is yet to be enacted

International Guidelines that may be applied

- W.H.O. Drinking Water Guidelines (1993)
- W.H.O. Environmental Guidelines and Standards for Industrial Discharge (1983)
- W.H.O Air Quality Guidelines
- UNEP International Register for Potentially Toxic Chemicals (IRPTC)
- FAO's Code of Conduct in Agriculture

International Conventions and Treaties that may be applicable

- The Ramsar Convention on Wetlands, 1972
- The CITES Convention on Trade in Endangered Species
- The Convention on Biological Diversity, 1992
- The Eastern Africa Regional Seas Convention
- The United Nations Framework Convention on Climate Change, 1992
- The Basel Convention on Trans-boundary Movement of Hazardous Wastes, 1989
- The Bamako Convention on the ban of Trans-boundary Movement of Hazardous Wastes into the Continent of Africa

1.7 MITIGATION MEASURES

In order to minimize environmental degradation and to promote sustainable development there are a number of mitigation measures and management options that may be used. These include the following:

1.7.1 Mitigation Measures Related to Natural Environment

- Avoid clearing of vegetation on steep slopes and near water courses and water bodies
- Promote agroforestry practices in appropriate areas using suitable tree spp. and management options
- Use good quality water and appropriate irrigation technology

- Promote appropriate soil and water conservation methods on lands under threat of soil erosion
- Promote appropriate use of agrochemicals and integrated pest management
- Use materials capable of being recycled for packing agricultural inputs and outputs
- Use appropriate equipment in farming operations
- Promote measures to prevent land degradation
- Minimize loss of species diversity by avoiding areas with high spp. concentrations
- Ensure proper processing and storage of grains and other foodstuffs
- Control grazing by maintaining sustainable stocking levels.
- Reduce water velocity in canals to reduce carrying capacity
- Minimize production of methane gas
- Promote Research and Development

1.7.2 Mitigation Measures Related to Human Environment

- Integrate local communities in project planning and implementation
- Compensate for losses due to agricultural projects
- Minimize conflict through comprehensive water needs assessment
- Introduce health and safety measures including medical monitoring
- Train fanners and other people involved in the project in safe use of equipment and agrochemicals
- Cultural promotion and education programmes, information dissemination services
- Strengthen law enforcement mechanism.

1.7.3 Monitoring and Auditing

Environmental monitoring is required to:

- Check that planned mitigation measures are implemented
- To ensure that guidelines/standards for pollutants are not exceeded and
- To provide early warning of environmental damage

Environmental auditing should be carried out after a project has been in operation for some time. The auditing should assist to assess actual impacts, accuracy of prediction, effectiveness of environmental impact mitigation and enhancement measures and the performance of monitoring mechanisms. The monitoring and auditing may involve:

- Gaseous discharges at designated points and time
- Micro-climatic changes
- Effluent and solid waste discharges
- Sessional monitoring of water quality
- Monitoring ground water
- Monitoring biological indicators
- Monitoring health problems that may be assisted with project implementation

- Radioactivity
- Socio-economic indicators

SECTOR CHECKLIST 2

INDUSTRY

2.1 SOURCES OF IMPACTS

Industrial Programmes and Projects have the potential to impact significantly on human health, the existing industrial and infrastructural activities and on the natural environment. The sources of such environmental impacts may include the following:

- Large Scale Industrial Complexes (e.g. oil refineries, cement manufacturing, pulp and paper mills, chemical plants, nuclear, thermal and geothermal, power plants, mineral and metal processing plants)
- Small and medium sized industries (e.g. tanneries, breweries, alcohol distilleries, agro-chemical plants, sugar factories, textile mills, rubber tyre plants, wood timber plants, paint, synthetic resins, plastic and fibres plants, iron and steel foundries, electroplating plants, soap and detergent, pharmaceutical plants and glass processing)
- Concentration of a large number of smaller plants in the same locality (e.g. export processing zone and jua kali projects)
- Rural Industrial Projects (e.g. bricks and gravel making, salt and sand harvesting and mineral refining)
- Agro-based Industries (e.g. fruit/vegetable canning, cotton ginneries, coffee pulping, tea processing, grain milling, slaughterhouses, poultry processing, dairy plants and fish processing)
- Forestry related industries (e.g. pulp and paper, furniture, charcoal, tannin, and timber)

2.2 PROJECT INPUTS

- Primary raw materials (e.g. fibre, minerals, food crops, hides and skins, rubber and petroleum products)
- Secondary raw materials (e.g. organic fluids, solvents, dyes, mineral acids and alkali)
- Water (either for processing, cooling, cleansing or conveyance)
- Energy (oil, wood, gas, electricity and solar)
- Labour (skilled and unskilled)
- Capital (machinery and equipment)
- Land (tenure and suitability)

2.3 PROJECT ACTIVITIES

- Site selection
- Site preparation and construction
- Operation of industrial processes:
  - Oil refining (ferrying crude oil, distillation, storage and distribution of oil products)
  - Pulp and paper milling (logging, pulping, bleaching, storing and transportation to market)
  - Chemical processing (extraction, formulation and/or re-formulation, refining, packaging, storage and distribution)
  - Agro-based processing (e.g. food processing, milling, alcohol extraction, drying, pulping, canning and/or packaging)
  - Mineral and metal processing (e.g. smelting, refining, alloying, hardening, fabricating)

- Agro-chemical processing (e.g. formulation and/or reformulation and packaging of fertilisers, pesticides and soil conditioners)

- Management of wastes

2.4 AREAS OF IMPACT

Industrial programmes and projects are likely to affect the following natural and human environments, among others:

2.4.1 The Natural Environment

- Air, Climate (gaseous and particulate matter composition)
- Surface and groundwater (quality and flow regimes)
- Protected areas
- Areas supporting critical habitat (e.g. wetlands)
- Areas supporting significant biodiversity (e.g. forests and marine ecosystems)
- Soil
- High potential agriculture areas
- Terrestrial and aquatic ecosystems
- Areas of scenic beauty

2.4.2 Human Environment

- Human settlements in proximity to the industrial project
- Existing infrastructural services and facilities
- Human population dynamics
- Existing land-uses to be displaced/converted (e.g. agricultural, recreational, residential)
- Labour market and labour availability
- Public health and safety
- Industrial accidents
- Land tenure and land pricing
- Sites of significant historical and cultural value

2.5 ENVIRONMENTAL IMPACTS

Industrial development programmes and projects may lead to a variety of environmental impacts that include the following:

2.5.1 General Impacts on the Natural Environment

- Loss of biodiversity
- Loss of vegetation cover
- Destruction of wildlife habitats
- Soil erosion
- Changes in hydrology

- Pollution (soil, water and air)
- Accumulation of non-biodegradable materials
- Damage to artifacts and land forms
- Change and/or loss of scenery

2.5.2 Specific impact on Natural Environment

- ***Impacts on air quality and climate***

Most industrial processes consume raw material and fuel resulting in emission of substances that can have impacts on the atmosphere. Such emission include:

- Carbon Dioxide (CO_2)
- Nitrogen Oxides (NO_x)
- Sulphur Oxides (SO^x)
- Methane (CH^4)
- Chloro-fluoro carbons (CFCs)
- Particulate matter

The emissions may cause the following atmospheric/climatic impacts:

- Photochemical smogs
- Global warming (increased climate variability/climate change)
- Depletion of stratospheric ozone
- Acid rains

- ***Impacts on Water Resources***

- Depletion of dissolved oxygen
- Contamination of surface water
- Siltation of water courses and water bodies
- Changes in turbidity and transparency which may interfere with photosynthetic processes of aquatic flora
- Increase of water temperature
- Increase of nutrients to the aquatic ecosystem leading to eutrophication
- pH changes
- Contamination of groundwater
- Changes in hydrological regimes
- Damage to sewerage systems
- Hazardous material accidents and spillages

- ***Impacts on Soil***

- Contamination of soil through deposition of contaminated industrial solid wastes
- Soil erosion
- Soil toxicity due to leachet from waste dumps

2.5.3 Impacts on Human Environment

- Creation of employment opportunities
- Introduction of secondary business
- Improvement of infrastructural services and facilities
- Increase in wealth and hence improvement of social status
- Damage to facilities due to corrosion and degradation of cultural sites
- Displacement of local population
- Conflicts with existing land uses
- Social-cultural disruption of the local population
- Labour conflicts between existing labour market and industrial project(s)
- Impacts on public health and safety:
  - Respiratory problems
  - Skin and eye problems
  - Chemical/industrial accidents
  - Spread of sexually transmitted diseases (STDs), and other communicable diseases
- Gender characteristics
- Conflicts in resource use
- Stress on existing social amenities
- Increase foreign exchange earnings

2.6 ENVIRONMENTAL GUIDELINES/STANDARDS

Environmental guidelines and standards in the industrial sector are meant to be a reference point upon which the threshold of impacts can be assessed. The pertinent guidelines/standards governing environmental quality with respect to industrial activities include the following:

National Legislation

- Factories Act, Cap. 514
- The Forests Act, Cap. 385
- Seed and Plant Varieties Act, Cap. 326
- Land Control Act, Cap. 302
- The Water Act, Cap. 372
- The Maritime Zones Act, Cap. 371
- The Public Health Act, Cap. 242
- Lakes and Rivers Act, Cap. 409
- The Fisheries Act, No. 5 of 1989
- The Wildlife (Conservation and Management) Act, Cap. 376
- The Science and Technology Act, Cap. 250
- The National Museums Act, Cap. 216
- The Agriculture Act, Cap. 318
- The Irrigation Act, Cap. 321
- The Government Lands Act, Cap. 280

- The Pest Control Product Act, Cap. 346
- The Radiation Protection Act, Cap. 243
- The Fertiliser and Animal Foodstuffs Act, Cap. 245
- The Food, Drugs and Chemical Substances Act, Cap. 254
- Mining Act, Cap. 306
- Land Planning Act, Cap. 303
- Local Government Act, Cap. 265
- Clean Air Act*c
- The Air Quality Standards *d
- National Drinking Water Standards *a
- National Effluent (wastewater) Discharge Standards *b

*a The standards are being formulated

*b The standards should be formulated

*c The Clean Air Act is yet to be enacted

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- W.H.O. Drinking Water Guidelines (1993)
- W.H.O. Air Quality Guidelines
- UNEP International Register of Potentially Toxic Chemicals (IRPTC)
- FAO's Code of Conduct in Agriculture
- ILO Guidelines

International Conventions and Treaties that may be applicable

- The United Nations Framework Convention on Climate Change (1992)
- Vienna Convention on Protection of the Ozone Layer
- Montreal Protocol on substances that deplete the Ozone Layer
- Ramsar Convention on Wetlands of International Importance especially as waterfowl habitat (1971)
- The CITES Convention on trade in endangered species
- The Convention on Biological Diversity (1992)
- The World Heritage Convention
- The Eastern Africa Regional Seas Convention
- Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal (1989)
- The Bamako Convention on the ban of Trans-boundary Movement of Hazardous Wastes into the Continent of Africa (1992)
- Convention concerning the protection of workers against occupational
- Hazards ~~in the~~ Working Environment due to Air Pollution, Noise and Vibrations

- Convention on protection of workers against radiations
- Convention on protection of workers against occupational hazards of air and water pollution at the working place

2.7 MITIGATION MEASURES

Implementation of industrial programmes and projects should be planned with a view to ensuring that they do not cause public resentment. They should be compatible with the existing developments and optimise on resources use, while minimising negative impacts. Mitigation measures should be formulated in consultation with project proponent, beneficiaries and other interested parties. Some of the mitigation measures include the following:

2.7.1 Mitigation Measures Related to Site Selection

- Physical plans based on the ecological zones among other factors should be prepared and complied with by all developers to avoid landuse conflicts
- Within urban areas, physical zoning for various land uses should be planned and enforced. Sitting of industries should seek to maintain compatibility with existing industrial development to avoid incidences of product contamination and especially with regard to food products
- Location of industrial projects should be based on the provision of adequate infrastructural services, including water supply, waste management facilities, accessibility to raw materials and market outlets. Sitting of industrial projects should avoid environmentally sensitive areas, historical and cultural sites
- Industrial projects should take into account public health and safety. They should not produce gaseous emissions beyond allowable levels, and should be located upwind from populated areas
- Involve local community in the planning stage of the project development to secure project acceptance
- Create public awareness on the project, its implications and the necessary adaptations Work out
- Work out compensation regimes taking into account various options such as land for land, monetary compensation conunensurate with the level of negative socio-economic impacts, and community assistance to better its living standards
- Consideration should be given to the efficiency of wastes collection, re-use and/or disposal

2.7.2 Mitigation Measures Related to Site Preparation And Construction

- Site preparations involving removal and exposure of soil should be limited to the dry season to minimise soil erosion
- Balance should be maintained between cut and fill on the site to minimise extent of exposure
- Landscaping and revegetation of exposed surfaces should be done as early as possible within the preparation and construction stage
- Any disused sedimentation basins and borrow pits made during this stage should be filled or drained to avoid creating disease vectors habitats
- Contingency measures should be established to deal with accidental spillages, particularly of oils and hazardous materials

2.7.3 Mitigation Measures Related to industrial operations

- Improve or provide social facilities such as schools and health centres to accommodate increasing local population
- Increase health and safety in the industrial work-place through well established health and safety procedures. safety training and on-site management of the services and clinical check-ups.
- Promote use of cleaner technologies.
- Provide and apply Material Safety Data Sheets (MSDS)
- Improve energy use efficiency to reduce on fuel consumption.
- Use alternative and/or renewable sources of energy where applicable.
- Provide green spaces in urban areas and promote afforestation. reafforestation and agro-forestry programmes
- Improve water use efficiency
- Conserve water catchment areas
- Incorporate water recycling
- Provide for containment, treatment and disposal of gaseous, liquid and solid wastes
- Provide for hazardous wastes containment and safe disposal
- Reduction use of toxic chemicals and provide appropriate technology for their removal from effluents
- Use secure storage facilities for toxic materials
- Provide facilities for accidental spillages in order to combat risk of industrial hazards
- Promote Research and Development

(See also checklists on mining)

2.7.4 Environmental Monitoring and Auditing

Environmental monitoring and auditing shall be conducted to ensure that the predicted project impacts are within the engineering and environmental acceptable limits, and in order to build-in early warning and improvement on the mitigation measures from the information obtained.

- Monitoring of projects will be done to establish baseline conditions, information at the implementation, operation and decommissioning stages
- The monitoring and auditing may involve:
  - Gaseous discharges at designated points and times
  - Any indicators of micro-climatic changes
  - Effluent and solid waste discharges
  - Monitoring upstream and downstream from the point of effluent discharge in any receiving water body
  - Seasonal monitoring of water quality
  - Monitoring groundwater
  - Monitoring of biological indicators
  - Monitoring health problems that may be associated with the project implementation

SECTOR CHECKLIST 3

TRANSPORTATION

3.1 SOURCES OF IMPACTS

The transportation sector falls into three sub-sectors, that is air, land and water transport. Some of the programmes and projects in this sector that may lead to significant environmental impacts include the following:

- Road transport network and related facilities
- Railway transport network and related facilities
- Air transport network and the related facilities
- Water transport network and related facilities
- Oil and gas pipelines and related facilities

3.2 PROJECT INPUTS

- Labour (skilled and unskilled)
- Machinery (e.g. excavators, dredger, and earth-moving equipments)
- Construction materials (e.g. gravel, stones), steel and cement
- Fuels and lubricants
- Land
- Air space
- Passengers and cargo
- Capital
- Water resources

3.3 PROJECT ACTIVITIES

- ***Route/Site Selection***

  - Surveying project route/site
  - Seismic and ground stability testing
  - Land acquisition
  - Resettlement

- ***Project Construction***

  - Establishing related works and supporting infrastructure (e.g. construction camps, clearing of vegetation, impounding, river regulation and/or diversion, diking, access roads)
  - Raw materials acquisition (e.g. dredging, mining, quarrying, water abstraction)
  - Excavation works and land filling
  - Transportation of raw materials, machinery and labour to site
  - Transportation of waste materials from site
  - Rehabilitation of affected surfaces including areas from which some raw materials have been obtained (e.g. quarries and mines)
  - Construction supervision
  - Levelling and landscaping

- ***Project Operations***

  - Route/site maintenance including rehabilitation
  - Passengers and cargo handling and transportation
  - Docking and parking
  - Storage and warehousing of goods including oil products
  - Servicing of machinery and equipments
  - Pumping and conveyance of liquid and gaseous products
  - Removal of wastes (e.g. domestic sewage, spillages, bilge, ballast, antifouling materials and dredging spoils)
  - Planned and unplanned activities (e.g. local transportation, hotels, tourism, mining, other formal and informal commercial activities)

3.4 AREAS OF PROJECT IMPACTS

Although the development of transport infrastructure enhances communication and economic activities, transport programmes and projects have the potential to impact on the following:

3.4.1 The Natural Environment

- Areas supporting critical and fragile habitats (e.g. wetlands, forests, coral reefs)
- Protected areas
- Areas supporting significant biodiversity
- Air
- Areas of scenic beauty
- Degraded environments
- Cultural and historical sites
- Lakes, rivers and other surface water bodies
- Terrestrial and aquatic flora and fauna
- Rocks and soils
- Groundwater aquifers
- Wildlife habitats and migration routes

3.4.2 The Human Environment

- Human settlements in proximity to the project
- Human population
- Land tenure system
- Existing land-use to be displaced/converted (e.g. settlements, farms, pastoral land, recreational areas, forest reserves)
- Existing provision of goods and services (e.g. market, health, education, commerce)
- Traditional livelihoods (e.g. fishing, farming, pastoralism)
- Cultural practices and values
- Public health and safety
- Gender characteristics
- Labour market and availability

- Existing infrastructural facilities and services (e.g. housing, water supply, means of communications, sewerage, electricity)
- Increase foreign exchange earnings

3.5 ENVIRONMENTAL IMPACTS

Transport programmes and projects may lead to a variety of environmental impacts that include the following:

3.5.1 General Impacts on natural Environment

- Loss of vegetation
- Loss or degradation of wildlife habitats
- Loss of areas of scenic beauty
- Creation of an imprevious surface
- Alteration of sorm drainage patterns and recharge of groundwater aquifers
- Loss of biodiversity
- Water, air and land pollution
- Incidences in ground vibrations
- Loss of natural routes for migratory species
- Noise pollution
- Soil erosion
- Salt intrusion
- Invasion of alien species of flora and fauna
- Accumulation of inorganic and organic materials
- Eutrophication
- Loss/degradation of historical and cultural sites

3.5.2 Specific Impacts on the Natural Environment

- ***Impacts on air/climate***

  - Increase in gaseous emissions
  - Increase in particulate matter
  - Increase in ambient temperature
  - Global climate change, modification of micro and meso climate
  - Increase of hydrocarbons
  - Increase frequency and intensity of photochemical smog (particularly in urban areas)

- ***Impacts on Inland Aquatic Ecosystems***

  - Surface water pollution
  - Change in hydrology
  - Change in groundwater recharge
  - Contamination of groundwater
  - Eutrophication
  - Degradation of estuarine and freshwater habitats

- Obstruction of migratory fish
- Increase in water salinity
- Siltation of water bodies
- Loss and degradation of wetlands

- ***Impacts on the Marine Environment***

  - Interference with the natural sea currents
  - Coastal erosion and siltation
  - Loss/degradation of biodiversity in the coral reef and lagoon
  - Pollution of the sea

3.5.3 Impacts on Human Environment

- Creation of employment and increased income
- Enhancement of communication, handling, storage and transfer of cargo
- Introduction of secondary developments
- Enrichment of social and cultural values
- Enhancement of technology transfer
- Loss of land and its uses
- Improvement of goods and services
- Enhanced capacity of the existing infrastructural facilities to support increased demands
- Change in the land value/prices
- Displacement and the need for resettlement
- Increased noise and air pollution, in proximity to the project and/or along the route
- Social and cultural disruption and/or erosion
- Increase in disease transmission
- Creation of habitats for disease vectors through stagnant water in borrow pits and quarries
- Contamination of surface and groundwater
- Increase in traffic accidents on land, at sea and in air
- Increased risks of explosions and fires
- Increased risks of spillages of oil and/or hazardous materials in transit
- Accident risks during construction
- Increased risks of hazardous chemicals and toxic substances
- Occupational health risks to workers

3.6 ENVIRONMENTAL GUIDELINES/STANDARDS

Environmental guidelines/standards are important in all considerations of railway, pipeline and road transportation. They are also important for site selection for the location of ports/harbours, aerodromes and the related facilities. The guidelines are applicable in the project implementation, operations, rehabilitation and decommissioning.

National Legislation

- Traffic Act, Cap. 403
- Maritime Zones Act, Cap. 371
- Merchants Shipping Act, Cap. 389
- Land Planning Act, Cap. 303
- Land Acquisition Act, Cap. 295
- Local Government Act, Cap. 265
- The Agriculture Act, Cap. 318
- The Water Act, Cap. 372
- The Mining Act, Cap. 306
- The Public Health Act, Cap. 242
- The Forests Act, Cap. 385
- Coast Development Authority Act, Cap ...
- Lake Basin Development Authority Act, Cap 441
- Tana and Athi Rivers Development Authority Act, Cap 443
- Kerio Valley Development Authority Act, Cap ...
- Ewaso Ngiro South Development Authority Act, Cap 447
- Ewaso Ngiro North Development Authority Act, Cap 448
- Wildlife (Conservation and Management) Act, Cap. 376
- The Petroleum (Exploration and Production) Act Cap. 308
- The Fisheries Act No. 5 of 1989
- The Coast Development Authority Act No. 20 of 1990
- The Radiations Protection Act, Cap. 243
- The Factories Act, Cap. 514
- The National Museums Act, Cap. 215
- The Antiques and Monuments Act, Cap. 215
- Ports/harbours building code
- Aerodromes design code
- Town/city Planning by-laws
- The Clean Air Act*c
- The Air Quality Standards*d
- The National Drinking Water Standards *a
- The National Effluent (wastewater) Discharge Standards*b

*a The standards are being formulated
*b The standards should be formulated
*c The Clean Air Act is yet to be enacted
*d The standards should be formulated
* The Environment Management and Coordination Act is yet to be enacted. It will apply in all the areas stated above.

International Guidelines that may be applied

- Highway design code
- W.H.O. Air Quality and Emissions Guidelines
- W.H.O. Drinking Water Quality Guidelines (1993)
- W.H.O. Environmental Guidelines and Standards For Industrial Discharge (1983)
- The International Maritime Organisation (I.M.O) Guidelines

International Conventions Applicable

- The CITES Convention on Trade in endangered species
- The Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat
- The Convention on Biodiversity (1992)
- The World Heritage Convention
- The United National Framework Convention on Climate Change (1992)
- The Vienna Convention for the protection of the Ozone Layer
- The United Nations Convention on the Law of the Sea (1982)
- The Convention for the Prevention of Pollution of the Sea by Oil
- Convention on the High Seas
- The Convention concerning the protection of workers against occupational hazards in the working environment
- The London Convention for Prevention of Maritime Pollution by Dumping of Wastes and Other Matters
- The London Convention for the Prevention of Pollution from Ships
- The Basel Convention on Control of Trans-boundary Movement of Hazardous Wastes (1989).
- The Bamako Convention on the ban of Trans-boundary Movement of Hazardous Wastes into the Continent of Africa (1994).
- The Eastern Africa Regional Seas Convention

3.7 MITIGATION MEASURES

The main objective of mitigation measures is to minimise the severity of negative impacts arising from development projects in the transportation sector. For programmes and projects in this sector, the following mitigation measures may be applied:

3.7.1 Mitigation Measures Related to Routing and Site Selection

- Routing for roads, railways and oil/gas pipelines should be done in accordance with physical plans that should be prepared, taking into account the uniqueness of various ecological zones. Similarly, siting of the ports/harbours and aerodromes should coincide with the physical plans and be developed only in areas designated for such developments.
- Activities in the transportation sector should avoid environmentally sensitive and geologically unstable areas.
- Migratory routes for animals including fish and birds should not be interfered with. Also migratory corridors and fish ladders should be provided, and activities that may attract birds close to airports avoided.

- Avoid historical and cultural sites
- Provide alternative routing and project sites in the project designs
- Establish buffer zones along transport corridors
- Provide for the needs of the affected communities including health, socio-economic and transport
- Promote public awareness on the project and its implications

3.7.2 Mitigation Measures Related to Route/Site Preparations and Construction

- Limit earth movement to dry season
- Dispose dredged material in areas meant for rehabilitation
- Balance cut and fill to avoid deposition
- Provide for adequate drainage
- Borrow pits should be rehabilitated
- Exposed slope should be revegetated to minimise soil erosion and landslides
- Storm drainage and stream crossings should be well planned to reduce frequency of flooding and to enhance surface flow and groundwater recharges
- Spillages should be contained and safely disposed
- Provide bundwalls, oil interceptors and windsocks at oil terminals
- Provide anti-pollution measures at service points (e.g. oil interceptors and other facilities for pollution abatement)
- Highway designs should provide for cut and fill that blends with the surrounding landscape.
- After construction, all unwanted structures, wastes, and unused materials should be removed to facilitate the recovery of the affected area to its original status
- Control dust and noise
- Compensate communities for land and other resources taken from them at project sites

3.7.3 Mitigation Measures Related to Route/Project Operation

- Plan for contingency
- Provide a maintenance plan for the infrastructure, machinery and equipments
- Strict compliance with the relevant environmental regulations in this sector
- Provide for efficient traffic management particularly in the urban centres
- Provide for collection, recycling, treatment and safe disposal of wastes
- Provide shoreline receptors to receive wastes from ships
- Training on handling and maintenance of machinery and equipment should be provided
- Provide adequate services including water supply, sewerage, health services
- Promote Research and Development

3.7.4 Environmental Monitoring and Auditing

Environmental Monitoring and Auditing in the transportation sector, like in many other sectors, is an important tool in determining compliance with the mitigation measures recommended for projects and programmes in this sector. It will be necessary also in the improvement of the mitigation measures undertaken or proposed for existing and future projects and programmes in transportation.

The monitoring and auditing in the sector may involve:-

- Gaseous discharges from various machines and equipment used in the project and/or programme.
- Gaseous compositions at designated points, to determine air quality trends.
- Monitoring indicaters of micro-climatic changes.
- Water quality trends.
- Monitoring biological indicaters.
- Monitoring health problems they may be associated with the project implementation.
- Monitoring soil, vegetation and animal changes in proximity to the project.

SECTOR CHECKLIST 4

HUMAN SETTLEMENT AND INFRASTRUCTURE

4.1 SOURCES OF IMPACT

Certain types and components of human settlements and infrastructure programmes and projects have the potential to give rise to significant environmental impacts. These include the following:

- Housing Development
- Water supply and sanitation
- Public purpose buildings (e.g. health and education institutions, recreational and facilities)
- Transport infrastructure (see transport sector checklist)
- Industries (see industry sector checklist)
- Energy (see energy sector checklist)
- Export processing zones, business parks, commercial developments and markets
- Ports and harbours
- Urban renewal
- Dams and reservoirs (see water sector checklist)
- Telecommunications
- Informal sector development (e.g. street markets and slums)
- Urban agriculture
- Irrigation schemes (see agriculture and water sector checklists)
- Settlement schemes
- Resettlement camps for refugees and displaced persons
- Upgrading of urban centres

4.2 PROJECT INPUTS

- Land
- Water
- Plant and equipment
- Labour (skilled and unskilled)
- Capital
- Construction materials (e.g. gravel, sand, ballast)
- Energy
- Policy and enforcement instruments

4.3 PROJECT ACTIVITIES

4.3.1. Planning

- Site selection and plan preparation
- Surveying and related activities
- Land acquisition
- Appraising baseline conditions to determine supply and demand for infrastructural services

4.3.2 Construction

- Relocation of residents and squatters
- Resettlement of displaced persons
- Establishing associated works and supporting infrastructure
- Acquisition and transportation of raw materials
- Construction of public utilities
- Excavation and filling works
- Transportation of waste materials from construction site
- Waste management
- Landscaping

4.3.3 Operation

- Waste disposal
- Servicing of plant and equipment
- Transportation
- Farming operations (see sector checklist I - agriculture)
- Hawking
- Agro-processing (see sector checklist 2 - industry)

4.4 AREAS OF IMPACTS

4.4.1 The Natural Environment

- Land
- Surface and ground water
- Air
- Flora and fauna (rare, endangered, threatened, species of special concern and species of economic importance)
- Protected areas (parks and reserves)
- Wildlife migratory routes
- areas supporting significant biodiversity
- Critical habitats

4.4.2 The Human Environment

- Human settlements in proximity to the project
- Existing land use
- Existing provision of goods and services
- Social cultural values
- Urban and rural populations (especially the poor, elderly, and those with physical disabilities)

- Areas, sites or buildings of historical, cultural, archeological and recreational importance

4.5 ENVIRONMENTAL IMPACTS

Human settlement and infrastructure programmes and projects may lead to a variety of environmental impacts that include the following:

4.5.1 General Impacts on The Natural Environment

- Loss of vegetation cover
- Loss of biodiversity
- Pollution (land, water and air)
- Destruction of water catchment areas, agricultural lands and national parks
- Destruction of wildlife habitats
- Increased climate variability/change
- Soil erosion
- Desertification
- Change of land use
- Improvement of the urban environment (through urban renewal programmes which incorporate important environmental concerns - e.g. replacing building environment with more open-spaces, greenery and playgrounds)

4.5.2 Impacts on The Human Environment

- Improved housing and public utilities
- Improved transportation services
- Increased formal and informal employment and income opportunities
- Rehabilitation and conservation of buildings/neighbourhoods
- Redevelopment (creation of more parking space, widening of roads, increased accommodation and creation of more open spaces)
- Improved land values and aesthetics (in planned settlements)
- Capital appreciation (in planned areas)
- Increased foreign exchange earnings
- Improvement of infrastructure in peri-urban areas
- Increased revenue base following upgrading of urban centres
- Increased development potential due to upgrading of urban centres and urban renewal
- Improved public health
- Displacement of people
- Social conflicts due to landlessness and squatting
- Movement of people to ecologically fragile areas (straining resources)
- Unplanned secondary development
- occupational hazards
- Erosion of cultures and introduction of diseases and pests
- Public health hazards

- Increase in noise, odour, insect and dust nuisance
- Land use conflicts
- Loss of urban open spaces, recreation facilities, way-leaves and buffer zones (due to lack of enforcement of planning regulations)
- Loss of scenic beauty
- Damage to artifacts and landforms
- Change of land use
- Disasters (fire, floods, earth quakes, landslides and failure of structures)
- Avian hazards
- Aircraft hazards
- Increase in crime, insecurity and other social ills

4.6 ENVIRONMENTAL GUIDELINES AND STANDARDS

Environmental Guidelines/standards in the human settlement and infrastructure are meant to assist the EIA agency, project proponent, EIA practitioners and other interested parties in assessing and determining the significance of environmental impacts. They are a reference point upon which the threshold of impacts can be assessed.

The pertinent guidelines/standards governing environmental quality with respect to human settlement and infrastructural activities include the following:

National Legislation

- The Government Lands Act, Cap 280
- The Local Government Act, Cap 265
- Land Planning Act, Cap 303
- Land Acquisition Act, Cap 295
- Public Health Act, Cap 242
- Land Control Act, Cap 302
- Chief's Authority Act, Cap 128
- The Town Planning Act, Cap 134
- The Registration of Titles Act Cap 281
- The Land Consolidation Act Cap. 283
- The Land Adjudication Act Cap 244
- Registration of Documents Act Cap 285
- Food, Drugs and Chemical Substances Act,Cap...
- Land (Group Representatives) Act Cap 287
- Way Leaves Act Cap 292
- Survey Act Cap 299
- The Water Act
- Registered Land Act Cap 300
- Town/City Planning and Building By-Laws and regulations
- The Antiques and Monuments Act, Cap 215

- Traffic Act Cap 403
- Fisheries Act No.5 of 1989
- The Agriculture Act Cap 318
- The Factories Act Cap 514
- The Mining Act Cap 306
- Irrigation Act, Cap 347
- Ports/Habours Building Code
- Aerodromes Design Code
- The Street Adophiar Act - Cap 406
- The Sectional Properties Act - No 21 of 1983
- Wildlife (Management and Conservation) Act, Cap 376
- Housing Act, Cap 117
- Local Authorities Service Charge Act, Cap 274
- The National Museums Act, Cap 216
- The Lake Basin Development Authority Cap 441
- The Tana and Athi Rivers Development Authority Act, Cap 443
- The Ewaso Ngiro South River Basin Development Authority Act Cap. 447
- The Ewaso Ngiro North River Basin Development Authority Act Cap 448
- The Coast Development Authority Act, Cap....
- Kerio Valley Development Authority Act Cap...
- The Forests Act Cap 385
- Science and Technology Act Cap 250
- Kenya Posts and Telecommunications Act Cap 411 Kenya Power and Lighting Company Act Cap 48 Occupiers Liability Act Cap 34
- The Kenya Bureau of Standards Act Cap 496
- High Way Design Code
- The Human Settlement Strategy for Kenya - 1978 Ports/harbours building code
- Aerodromes design code
- Town/city Planning by-laws
- The Clean Air Act*c
- The Physical Planning Act Cap...
- The Air Quality Standards*d
- The National Drinking Water Standards *a
- The National Effluent (wastewater) Discharge Standards*b

*a The standards are being formulated

*b The standards should be formulated

*c The Clean Air Act is yet to be enacted

*d The standards should be formulated

*e The Physical Planning Act is yet to be enacted

* The Environmental Management and Coordination Act is yet to be enacted. It will apply in all the areas stated above.

International Guidelines that may be applied

- W.H.O. Environmental Guidelines and Standards for Industrial Discharges (1983)
- W.H.O. Drinking Water Guidelines (1993)
- W.H.O. Guidelines on Air Quality
- UNEP International Register of Potentially Toxic Chemicals(IRPTC)
- FAO's Code of Conduct in Agriculture
- ILO Guidelines
- I.M.O Guidelines

International Conventions and Treaties that may be applicable

- The United Nations Framework Convention on Climate Change (1992)
- Vienna Convention on Protection of the Ozone Layer
- Montreal Protocol on substances that deplete the Ozone Layer
- Ramsar Convention on Wetlands of International Importance especially as waterfowl habitat (1971)
- The CITES Convention on trade in endangered species
- The Convention on Biological Diversity (1992)
- The World Heritage Convention
- The Eastern Africa Regional Seas Convention
- Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal (1989)
- The Bamako Convention on the ban of Trans-boundary Movement of Hazardous Wastes into the Continent of Africa (1992)
- Convention concerning the protection of workers against occupational hazards in the Working Environment due to air pollution, noise and vibrations
- Convention on protection of workers against radiations
- Convention on protection of workers against occupational hazards of air and water pollution at the working place
- The United Nations Convention on the Law of the Sea (1982)
- The Convention for the Prevention of Pollution of the Sea by Oil
- Convention on the High Seas
- The Convention concerning the protection of workers against occupational hazards in the working environment
- The London Convention for Prevention of Maritime Pollution by Dumping of Wastes and Other Matters
- The London Convention for the Prevention of Pollution from Ships

4.7 Mitigation Measures

The implementation of human settlements and infrastructural programmes and projects should ensure the conservation of natural environment and enhanced development of habitable and sustainable built environment. To achieve this challenging task mitigation measures should be

determined through cross participation of those for who the project is intended and other interested parties likely to be adversely affected. The following are some of the mitigation measures:

4.7.1 Mitigation Measures Related to Planning

- Plan appropriate project site to avoid conflict with other users
- Avoid sitting projects in an environmentally sensitive areas. cultural. archaeological and historical sites
- Take due consideration of the potential social problems of the local population in utilizing project facilities
- Design appropriate infrastructure systems to enhance use ability maintenance and reduce conflict
- Promote neighbourhood planning in new settlement to ease traffic congestion in the central business district areas
- Incorporate integrated planning and management
- Strengthen the capacities to enhance management
- Encourage public participation and other interested parties in project planning, design. and implementation to avoid conflict
- Comply with land use plans
- Provide incremental standards for housing and infrastructure development
- Revise regularly planning and building regulations and by-laws to ensure their appropriateness in promoting planned development
- Ensure accessibility and use of buildings and infrastructure by all people including people with special disabilities
- Resurface and revegetate exposed services
- Integrate informal sector in physical plans
- Develop contingency plans for disaster management
- Develop clean-up plans for wastes and spills (e.g. maritime and harbour area spills)
- Provide appropriate and adequate refuse and waste collection measures and facilities
- Provide for waste segregation for efficient management
- Provide health, education and recreational facilities
- Incorporate health, sanitation and safety education programmes addressing Operation of facilities Hygiene
- Provide for toxic and hazardous materials containment and disposal
- Encourage community association to promote neigbournood management of appropriate human settlement issues
- Provide and facilitate self financial schemes such as revolving funds and land readjustment approaches
- Encourage adherence to professional ethics
- Reduce/prevent resource depletion through:
  - Improved pricing
  - Integrated watershed management
  - Improved technologies e.g. waste water reuse
  - Improved operation and maintenance

- Appropriate regulation
- Public education programmes
- Use of energy saving cook stoves
- Promotion of agro-forestry

- Rehabilitate quarries/mines
- Resettle displaced and landless people in appropriate areas
- Compensate displaced people taking into account various options such as land for land, monitoring compensation, commensurate the level of negative social economic impact
- Assist the communities in adjusting to the new condition
- Provide alternatives sources of energy in refugee camps
- Promote research and development

4.7.4 Environmental Monitoring and Auditing

In the development of human settlements and infrastructure, environmental monitoring and auditing will be conducted to ensure that the anticipated project impact and predictions are within the planning, engineering and environmentally acceptable limits. The information obtained will provide early warning and help in the improvement of the proposed mitigation measures. Monitoring and auditing in this sector may involve:

- Number of people employed
- Income levels/ per capita income
- Number and types of enterprises started
- Gross Domestic Product
- Distribution of generated income
- Availability and types of infrastructure and services
- Area covered and value of land/landuse
- Capacity of facility
- Quality of facility
- Maintenance of facility/service
- Congestion/overcrowding
- Amount of energy (see energy sector checklist
- Types and numbers started
- Scale/capacity
- Benefits to workers and secondary development/multiplier effect
- Capacity for waste treatment
- Rate of population increase and distribution
- Number of people to be displaced/resettled
- Area/density
- Occupation of people
- Public outcry/complaints/conflicts
- Availability of approved plans/development plans/site plans
- Involvement of interested parties

- Number of illegal subdivision and extensions
- Number of illegal change of user (e.g. conversion of recreation and wayleavaes to other uses)
- Pressure on existing facilities
- Loss of vegetation cover
- Loss of biodiversity
- Pollution (land, air, water, noise and oduor)
- Increase in surface run-offs
- Increase in crime rates
- Disasters

  - Type and location
  - Area covered
  - Value of property affected
  - Number of people/property affected
  - Availability of contingency plans/measures (monetary compensation)
  - Disaster preparedness
  - Frequency

- ***Traffic congestion***

  - Types/location
  - Volume of vehicles/pedestrians
  - Modes/means of transport
  - Adequacy of related facilities (e.g. roads)
  - Pollution types and levels

- ***Recreation***

  - Area of land covered
  - Type
  - Number of visits/frequency
  - Tourist attraction
  - Revenue generated
  - Maintenance of facility
  - Number employed
    –Control measures

- ***Waste management***

  - Volume of solid /liquid waste generated

SECTOR CHECKLIST 5

WATER RESOURCES

5.1 SOURCES OF IMPACTS

- Dams and reservoirs
- Cross-drainage (interbasin water transfer)
- Irrigation and drainage (see agriculture checklist)
- Flood control schemes
- River diversions
- Groundwater abstraction
- Rural sanitation (pit latrines, sceptic tanks and cesspool)
- Water purification plants
- Household water supply (e.g. boreholes. shallow wells and rainwater harvesting)' Water conveyance and distribution
- Agriculture (see sector checklist 9 - Fisheries and Aqriculture)
- Urban sanitation (sewage collection, treatment, storm drainage)
- Energy generation projects (hydroelectric power and geothermal projects)
- Water navigation and recreation

5.2 PROJECT INPUTS

- Land
- Construction material, Labour (skilled and unskilled) Surface and ground water Water treatment chemicals Energy
- Capital
- Plant and equipment

5.3 PROJECT ACTIVITIES

5.3.1 Project Sitting

- Identifying of sites for water supply sources, storage, waste treatment and disposal
- Estimating water supply and consumption demands
- Determining the quantity and quality of water
- Determining the reliability of water source(s)
- Determining the existing water and sewerage facilities

[1]Household include institution

5.3.2 Construction

- Surveying project site/routes
- Seismic and ground stability testing
- Land acquisition
- Resettlement

- Site and route preparation
- Establishing related works and supporting infrastructure
- Excavation works and land filling
- Acquisition and transportation of raw materials to site
- Construction and supervision
- Transportation of waste materials from site
- Landscaping
- Collection system involving a dam of reservoir, with intake, a catchment basin for a river, or a well field
- Conveyance system consisting of a pipeline or an open channel, constructed to distribute water
- by gravity or pumping
- Treatment system, e.g. slow sand infiltration of disinfection
- Distribution system embracing public standpipes or fountains
- Metering system to determine total consumption and to monitor demand variations
- Sewage collection treatment and disposal system,
- Sludge management

5.3.3 Operations and Maintenance

- Reservoir and flow control
- Treatment of water and sewage
- Waste recycling, reuse and/or disposal
- Maintenance of system integrity
- User education on health, sanitation and conservation
- Vegetation clearing
- Decommissioning

5.4 AREAS OF IMPACTS

The natural and human environments likely to be affected by water resources projects and programmes include the following:

5.4.1 The Natural Environment

- Protected areas
- Aquatic flora and fauna (rare endangered, and threatened species)
- Land (soil and vegetation)
- Air
- Mineral resources
- Geological formations
- Wetlands
- Critical habitats

- Surface and ground water

5.4.2 The Human Environment

- Human Settlements in proximity to the project
- Land use
- Existing infrastructural facilities and services
- Water use rights
- Public health and safety
- Cultural, historical and archaeological sites
- Traditional livelihoods and food security
- Human population
- Areas of scenic beauty
- Cultural practices and values

5.5 ENVIRONMENTAL IMPACTS

Adverse environmental impacts of projects and programmes in the water sector are associated primarily with project location, oversights in planning and design, construction works and deficiencies in project operations and decommissioning.

5.5.1 Impacts on the Natural Environment

- Pollution (air, land and water)
- Changes in surface and ground water hydrology
- Inundation of mineral resources
- Decrease in downstream and delta fisheries
- Siltation of water bodies
- Soil erosion
- Invasion of water bodies by aquatic weeds
- Eutrophication
- Loss of biodiversity and vegetation cover
- Desiccation of vegetation and soils
- Loss of habitat
- Habitat modification
- Saline water intrusion
- Drying up of marginal wells
- Land subsidence
- Desertification (land degradation)
- Flood and bank control
- Alteration of drainage patterns
- Water logging, salination and alkalinization

5.5.2 Impacts on the Human Environment

- Provision of water for multiple use
- Creation of employment opportunities and increased income
- Provision of clean safe water
- Flood control or alleviation
- Revenue generation
- Promotion of secondary development
- Enhanced multiplier effects
- Increased risks of occupational hazards
- Noise and dust pollution
- Displacement of people
- Loss of land use
- Increased risks of water related diseases
- Enhanced development of flood prone areas
- Increased access to portable water (especially for women)
- Reduced access for livestock due to dykes
- Improved sanitation
- Risks of poisoning from agro–chemicals
- Increased risks of malnutrition (particularly in irrigation schemes)

5.6 ENVIRONMENTAL GUIDELINES/STANDARDS

Environmental guidelines/standards in the water resources sector are meant to assist the EIA agency, project proponent, EIA practitioners and other interested parties in assessing and determining the significance of environmental impacts. They are a reference point upon which the threshold of impacts can be assessed.

The pertinent guidelines/standards governing environmental quality with respect to water resources development activities include the following:

National Legislation

- The Water Act Cap 372
- The Irrigation Act, Cap 347
- The Fisheries Act No. 5 of 1989
- The Public Health Act, Cap 242
- The Malaria Prevention Act Cap 246
- The National Water Conservation and Pipeline Corporation Act L/No.270/1988
- The Factories Act, Cap 514
- Lakes and Rivers Act, Cap 409
- The Maritime Act, Cap 371
- The Continental Shelf Act, Cap 312
- The Land Planning Act, Cap 303
- The Government Lands Act, Cap 280

- The Land Control Act, Cap 302
- The Land Acquisition Act, Cap 295
- The Mining Act, Cap 306
- The Chief's Authority Act, Cap 128
- The Pest Control Product Act, Cap 346
- Food, Drug and Chemical Substances Act, Cap 254
- The Suppression of Noxious Weeds Act, Cap 325
- River Authorities Act, Cap 443
- The Local Government Act, Cap 265
- The Kenya Power and Lighting Company Act, Cap
- Kenya Railways Act, Cap
- Lake Basin Development Authority Act, Cap 442
- Kerio Valley Development Authority Act, Cap 441
- Tana and Athi Rivers Development Authority Act Cap 443
- Coast Development Authority Act, No. 20 of 1990
- Ewaso Ng'iro South River Basin Development Authority Act Cap 447
- Ewaso Ng'iro North River Basin Development Authority Act Cap 448
- Wayleaves Act, Cap 292
- Kenya Bureau of Standards Act Cap. 496
- Kenya Bureau Standards for Mineral and containerized water
- The Air Quality Standards *d
- The National Drinking Water Standards*a
- The National Effluent (wastewater) Discharge Standards*b

*a The standards are being formulated

*b The standards should be formulated

*c The Clean Air Act is yet to be enacted

*d The standards should be formulated

* The Environmental Management and Coordination Act is yet to be enacted. It will apply in all the areas stated above.

International Guidelines that may be applied

- W.H.O. Environmental Guidelines and Standards for Industrial Discharges (1983)
- W.H.O. Drinking Water Guidelines (second edition 1993)
- W.H.O. Guidelines on Air Quality
- UNEP International Register of Potentially Toxic Chemicals (IRPTC)
- European Union Standards (EEC 78/769 and 79/923)
- European Union Waste Water Discharge Guidelines (EEC 76/160, 78/658 and 79/923)
- FAO's Code of Conduct in Agriculture
- FAO's Guidelines for Irrigation Water Quality
- ILO Guidelines
- I.M.0 Guidelines

International Conventions and Treaties that may be applicable

- The United Nations Framework Convention on Climate Change (1992)
- Vienna Convention on Protection of the Ozone Layer
- Ramsar Convention on Wetlands of International Importance especially as waterfowl habitat (1971)
- The CITES Convention on trade in endangered species
- The Convention on Biological Diversity (1992)
- United Nations Framework Convention on Desertification and Drought (1994)
- The Eastern Africa Regional Seas Convention
- Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal (1989)
- The Bamako Convention on the ban of Trans-boundary Movement of Hazardous Wastes into the Continent of Africa (1992)
- Convention concerning the protection of workers against occupational Hazards in the Working Environment due to air pollution, noise and vibrations
- Convention on protection of workers against radiations
- Convention on protection of workers against occupational hazards of air and water pollution at the working place
- The United Nations Convention on the Law of the Sea (1982)
- The Convention for the Prevention of Pollution of the Sea by Oil
- Convention on the High Seas
- The London Convention for Prevention of Maritime Pollution by Dumping of Wastes and Other Matters
- The London Convention for the Prevention of Pollution from Ships

5.7 Mitigation Measures

- Soil conservation
- Noise (sound screens, dumpers, silencers)
- Restrict access to waste water and sludge disposal sites

- Plan sitting of shallow wells taking into account the location of pit latrines
- Protect springs and shallow wells from contamination through service runoff
- Clear and remove vegetation prior to inundation of reservoirs
- Provide for multi-level intake to avoid anoxic water
- Limit retention time in reservoirs
- Regulate abstraction of water from wells (especially in coastal areas) to avoid overpumping Maintain compensation flow in water courses
- Provide fish ladders and bypasses
- Line waste disposal site to prevent ground water contamination
- Treat recycle/reuse waste water
- Promote water use efficiency and conservation
- Compensate displaced people taking into account various options such as land for land. monitoring compensation, commensurate the level of negative social economic impact
- Assist the communities in adjusting to the new condition
- Select project site taking into account mineral deposits
- Control disease vectors (e.g. through periodical flushings, reservoir level control and clearing of weeds)
- Comply with water regulations on sitting of boreholes
- Encourage rain water and stormy water harvesting
- Regulate interbasin water transfer taking into account the water needs of the basin of origin and the assimilative capacity of the receiving basin
- Incinerate/bury screenings from sewage filters
- Provide on site health facility and undertake periodic clinical checkup for the staff
- Provide sluices, dykes-toes and drain canals to avoid drainage
- Problems in flood control schemes
- Design dykes with flatter
- Embarkment slopes and provide access paths for livestock
- Use lined.water delivery canals and channels or pipes
- Plan irrigation schemes taking into account water quality, soil
- Characteristics and climatic conditions
- Maintain system integrity
- Ensure efficient process control to avoid oduor nuisance from sewage systems
- Involve communities in the planning, operation and maintenance of water supply
- Provide contingency plans for disaster management (e.g. in case of dam overtopping, gross pollution, gas leak)
- Provide for strategic water storage and protect all water supply installation
- Incorporate health, safety and sanitation and education programmes:

  - Operation of facilities
  - Hygiene

5.7.3 Monitoring and Auditing

Environmental monitoring and auditing will be conducted to ensure that potential project impacts are minimized through adequate implementation of mitigation measures and also to provide early warning on unforeseen impacts. Monitoring and auditing in this sector may involve:

- Noise level
- Dust level
- Plant and animal species composition and numbers
- Water depth, current velocity, river flow
- Ground water flow rate, water table and hydraulic gradient
- Fish species composition, diversity and fish yield
- Changes in ground level and slopes
- Soil texture, bulk density and pore size
- Soil chemical characteristics
- Type and characteristics of aquatic weeds
- Phosphorus loading, other nutrient levels, chlorophyll and dissolved oxygen level
- Incidence and prevalence of vectorborne diseases
- Ground water recharge rates and yields
- Soil moisture contents
- Electrical conductivity
- Water quality parameters
- Area under stagnant water
- Nutritional status of the community
- Sewage generation vis-a-vis the design capacity of sewerage system

SECTOR CHECKLIST 6

MINING

6.1 SOURCES OF IMPACT

Some types of mining activities and programmes have potential to cause significant environmental impacts. These include the following:

- Quarrying (surface mining of rock e.g. marble, granite, slate, limestone, etc.)
- River sand scooping
- Surface mining of mineral deposits
- Underground mining
- Ore processing and concentrating
- Exploration for petroleum and natural gas
- A mining operation can be a major industrial complex with many workers and appreciable processing, transport and service facilities.

6.2 PROJECT INPUTS

6.2.1 Inputs to Mining

- Boring and lifting equipment
- Excavating and transporting equipment
- Transport infrastructure and equipment (e.g. track, rail, pipeline, conveyor belt) Bulk storage, blending and loading facilities
- Support and workforce service facilities
- Skilled and manual labour
- Capital
- Land

6.2.2 Inputs to on-site Mineral Processing

- Land
- Raw Materials
- Processing machinery
- Transport and storage facilities
- Energy
- Water
- Labour
- Capital

6.2.3 For inputs to industrial process, see sector checklist for Industry

6.3 PROJECT ACTIVITIES

- Removal and processing of mined material
- Drainage of mine area and discharge of mine waters
- Storage/disposal of mining material wastes

- Operation of mining equipment
- Transportation of the mined material
- Bulk storage, blending and loading
- Transportation of the processed product to markets

6.4 AREAS OF IMPACT

Mining programmes and project have the potential to impact on the environment as follows:

- Local populations in the proximity of mining project areas
- Existing landuses to be changed/displaced
- Ecologically sensitive environments
- Areas of historical or cultural significance
- Surface water bodies
- Groundwater
- Terrestrial habitats
- Atmospheric air
- Rocks/soils

6.5 ENVIRONMENTAL IMPACTS

The potential environmental impacts due to mining programmes and projects include:

6.5.1 Impacts On The Natural Environment

- Disruption to and modification of landscapes
- Changes of surface and underground drainage
- Land subsidence
- Loss of existing landuses
- Disturbance to population
- Loss/degradation of habitats
- Destruction of vegetation to produce charcoal for smelting
- Stream siltation and other forms of degradation of surfacewaters by soil erosion
- Contamination of surface and underground waters
- Disruption of local aquifers
- Competition for local water resources
- Water pollution
- Soil contamination
- Degradation of air quality
- Loss of amenity

6.5.2 Impacts on the Human Environment

- Increased noise levels, dust, vibrations
- Increased employment opportunities
- Improved infrastructure
- Landuse conflicts/displacement
- Resettlement
- Subsidence risks with and damage to livelihoods and cultures
- Health and safety impacts
- Disruption of social fabrics and livelihoods

6.6 ENVIRONMENTAL GUIDELINES/STANDARDS

The pertinent guidelines/standards governing environmental quality with respect to mining activities include the following:

National Legislation

- Mining Act, Cap. 306
- The Wildlife (conservation and management) Act, Cap. 376
- Science and Technology Act, Cap. 250
- The Forests Act, Cap. 385
- The Fisheries Act. No. 5 of 1989
- The Maritime Zones Act, Cap. 371
- The Plant Protection Act, Cap. 324
- The Seed and Plant Varieties Act, Cap. 326
- Suppression of Noxious Weeds Act, Cap. 325
- Coconut Preservation Act, Cap. 332
- The Petroleum (Exploration and Production) Act Cap. 308
- National Museums Act, Cap. 216
- The Water Act, Cap. 372
- Pest Control Product Act, Cap. 346
- Irrigation Act, Cap. 347
- Lakes and Rivers Act, Cap. 409
- The Agriculture Act, Cap. 318
- The Government Lands Act, Cap. 280
- Crop Production and Livestock Act, Cap. 321
- Seed and Plant Varieties Act, Cap. 326
- Land Control Act, Cap. 302
- The Clean Air Act*[c]
- The Air Quality Standards *[d]
- The National Drinking Water Standards *[a]
- The National Effluent (wastewater) Discharge Standards*[b]

*a The standards are being formulated
*b The standards should be formulated
*c The Clean Air Act is yet to be enacted
*d The standards should be formulated
* The Environmental Management and Coordination Act is yet to be enacted.

International Guidelines that may be applied

- W.H.O. Air Quality and Emissions Guidelines
- W.H.O. Drinking Water Quality Guidelines
- W.H.O. Environmental Guidelines and Standards for Industrial Discharges (1983)
- UNEP International Register of Potentially Toxic Chemicals (IRPTC)

International Conventions and Treaties that may be applied

- The Ramsar Convention on Wetlands of International
- Importance especially as waterfowl habitats (1971)
- The CITES Convention on trade in endangered species
- The convention on Biological Diversity
- The Eastern Africa Regional Seas Convention
- The United Nations Framework Convention on Climate Change
- The Basel Convention on Trans-boundary Movements of Hazardous Wastes
- The Bamako Convention on the ban of Trans-boundary Movement of Hazardous Wastes into the Continent of Africa

6.7 MITIGATION MEASURES

umber of mitigation and management measures can be taken to protect the environment from adverse effects of mining programmes and projects. The mitigation measures can constitute an action plan. Mitigation measures should be determined in a participatory manner with those for whom the project is intended and those others likely to be adversely affected.

6.7.1 Mitigation Measures Related to Project Sitting

- Conduct predevelopment study communities likely to be affected to identify possible impacts on services, infrastructure and predict dislocations and conflicts
- Resource surveys should be conducted to identify significant flora and fauna, cultural and historic sites, surface and groundwater quality and quantity, landuses and topographic features
- Minimise disturbance to significant habitats
- Identify and resolve resource use conflicts

6.7.2 Mitigation Measures Related to Mining Operations

- ***Mitigation of socio-economic impacts***

- Consult with local landusers regarding sitting access roads, air fields, utility lines and mining and processing facilities
- Mining operations should be made compatible with existing land uses
- Compensate communities for opportunity cost and assist them to adjust to the new development
- Establish mutual working relationships with local communities and maintain them throughout the project
- Encourage project workers to participate on community activities
- Sensitise employees on local cultures, traditions and lifestyles
- Involve local leaders in the project decision-making process
- Introduce health and safety measures

    * Provide periodic training and continual safety reminders to all operating staff
    * Brief all visitors on hazards and safety precautions
    * Ensure that appropriate safety and rescue equipment is available and employees are trained in its use
    * Observe road load limits
    * Design roads for adequate capacity and visibility
    * Ensure that roads are properly signed, vehicles are well maintained, and drivers are trained
    * Introduce engineering controls, administrative controls, personnel protection, health and safety planning and medical monitoring

- Provide physical support to prevent disaster in mining operations
- Introduce monitoring controls or landuse restrictions in areas prone to subsidence
- Promote Research and Development

Mitigation Measures Related to Impacts on Terrestrial Ecosystem

- Restrict use of access roads, and reclaim any disused access roads at the end of the mining operation
- Reclaim degraded habitats
- Install warning signs at wildlife/livestock crossings
- Install road underpasses where appropriate
- Take measures to minimise noise disturbance
- Avoid blasting at night or early morning

Mitigation Measures Related to Impacts on Aquatic Ecosystems

- Monitor water quality
- Ensure management of mine tailings, domestic sewage and stormwater runoff to meet water quality standards before discharge
- Ensure management of solid waste of both mining and on-site mineral processing operations Avoid disturbance of streams, drainage channels, ponds and wetlands and aquifers (disturbance through abstraction, obstruction, pollution and diversion)
- Use appropriate blasting technology to minimize airborne particulate matter
- Apply water, sealants or suppressants to site areas, stocking heaps, waste spoil and haulage roads to reduce dust
- Fit effective pollution control devices in all diesel and petrol powered equipment

- Control the emission of hydrocarbon vapour at fuel transfer points
- Establish emergency plans for clean-up of accidental spoils
- Install emission treatment technology at on-site mineral processing industries and cover dry material during transportation

6.7.3. Environmental Monitoring and Auditing

This may involve monitoring of:

- Air quality at designated points
- Groundwater
- Seismic vibrations
- Surface water flow and quality
- Mine drainage
- Sanitary wastes
- Disposal of non-economic mineralised material
- Management and disposal of hazardous wastes
- Radioactivity levels at working and project boundaries
- Soil, Vegetation and animal dynamics
- Habitat quality
- Public health
- Socio–economic (See also Checklist 2 on Industry)

SECTOR CHECKLIST 7

FORESTRY

7.1 SOURCE OF IMPACT

Certain types of forestry projects and programmes have the potential to lead to significant environmental impacts. These include the following:

- Afforestation and reforestation schemes
- Watershed management schemes
- Commercial logging
- Introduction of exotic tree species
- Change of land use from forestry
- Forest excisions for various uses (e.g. settlement)
- Establishment of forest monocultures
- Forest based industries
- Plantation development
- Tourism development within forests and adjust areas

7.2 PROJECT INPUTS

- Land
- Tree inoculum (seeds, seedlings and cuttings for planting)
- Capital
- Labour
- Pesticides and fertilizers
- Equipment
- Energy
- Water

7.3 PROJECT ACTIVITIES

- Land preparation
- Road construction
- Establishment of logging camps
- Protection of certain forested areas
- Saw milling
- Tourism
- Harvesting of non-wood products
- Harvesting (clear felling and selective logging)
- Log transportation
- Application of fertilizers and pesticides
- Weeding and understorey management
- Tree replanting

7.4 AREAS OF IMPACT

The natural and human environments likely to be affected by forestry projects and programmes include the following:

7.4.1 The Natural Environment

- Atmosphere
- Wetlands
- Forested catchment areas
- Steep slopes
- Areas of scenic beauty
- Protected areas
- Cultural and archaeological significance
- Areas set aside for scientific research and education purposes

7.4.2 Human Environment

- Human settlements in proximity to the forest project area
- Existing landuse
- Current status of goods and services
- Labour market
- Traditional livelihoods
- Gender characteristics
- Land tenure systems
- Forest squatters
- Indigenous forest dwellers

7.5 ENVIRONMENTAL IMPACTS

The following are some of the potential environmental impacts arising from forestry projects:

7.5.1 General Impacts on Natural Environment

- Changes in existing forest and associated ecosystems
- Changes in surface and groundwater resources
- Loss of natural vegetation and wildlife habitat
- Disturbance of animals as a result of logging and other forest activities
- Interference with regeneration of trees and other plant species
- Decline/loss of species diversity and plant biomass
- Interference with nutrient cycling in forest ecosystem
- Soil erosion
- Changes in sediment load in streams and water bodies
- Land degradation

- Interference with aquatic flora and fauna
- Changes in micro climate

7.5.2 Specific Impacts on Natural Environment

- *Water resources*
  - Localized impoundment and stagnation due to land form change, watercourse obstruction and soil compaction
  - Water pollution and eutrophication from pesticides, fertilizers and organic matter
  - Reduced aquifers recharge
  - Change in the normal water yields, flood occurrence and magnitude

- *Impacts on Air Quality*

  - Increase of dust particles in the dry season
  - Reduction of carbon dioxide (CO_2) sinks due to burning and removal of vegetation
  - Planting trees contributes to carbon sequestration
  - Planting trees enhances air quality

7.5.3 Impacts on Human Environment

- Employment generation
- Income generation
- Overloading of infrastructure and socio services (e.g. housing, education, health) by influx of forest workers and spontaneous settlers
- Loss of use of forest products
- Loss of cultural sites
- Land use conflicts
- Erosion of socio-cultural values and practices
- Increased health problems
- Promotion of education and research on forestry management
- Spontaneous settlements and cultivation in forest areas

7.6 ENVIRONMENTAL GUIDELINES/STANDARDS

Environmental Guidelines/standards in the Forestry sector are meant to assist the EIA agency, project proponent, EIA practitioners and other interested parties in assessing and determining the significance of environmental impacts. They are a reference point upon which the threshold of impacts can be assessed.

The pertinent guidelines/standards governing environmental quality with respect to forestry activities include the following:

National Legislation

- The Forest Act, Cap. 385
- Land Control act, Cap. 302
- Land Planning Act, Cap 303

- Trust Land Act, Cap. 285
- Pest Control Product Act Cap 346
- Fertilizer and Animal Foodstuff Cap 345
- The Plant Protection Act Cap 324
- The Seed and Plant Varieties Act Cap 326
- Suppression of Noxious Weeds Act Cap 325
- Agricultural Act, Cap. 318
- Crop Production and Livestock Development Act, Cap. 321
- Irrigation Act, Cap. 347
- Land Control Act, Cap. 302
- Government Lands Act, Cap. 280
- Wildlife (Conservation and Management) Act, Cap. 376
- Fisheries Act No. 5 of 1989
- National Museums Act, Cap. 216
- Water Act, Cap. 372
- River Authorities Act, Cap. 443
- Public Health Act, Cap. 242
- Radiation Protection Act, Cap. 243
- Local Government Act, Cap. 265
- Chief's Authority Act, Cap. 128
- Antiques and Monuments Act, Cap. 215
- Land Acquisition Act, Cap. 295
- Tourists Industry Act, Cap. 385
- Grass Fire Act, Cap. 327
- Factories Act, cap. 514
- Timber Act, Cap. 386
- Regional Development Authorities Acts
- The Forest Policy (1996)*1
- The Kenya Forestry Master Plan
- The Kenya National Environment Action Plan
- Sessional Paper on Environment and Development Policy*2
- Clean Air Act*c
- The Air Quality Standards*d
- National Drinking Water Standards*a
- National Effluent (wastewater) Discharge Standards *b

*a The standards are being formulated

*b The standards should be formulated

*c The Clean Air Act is yet to be enacted

*d The standards should be formulated

* The Environmental Management and Coordination Act is yet to be enacted.

*1 The Forestry Policy is yet to be adopted by Parliament
*2 The Sessional Paper on Environment and Development is yet to be adopted by Parliament

International Guidelines that may be applied

- W.H.O. Environmental Guidelines for Industrial Discharges (1983)
- W.H.O. Drinking Water Guidelines (1982)
- UNEP International Register of Potentially Toxic Chemicals (IRPTC)
- FAO's Code of Conduct in Agriculture

International Conventions and Treaties that may be applied

- The Convention on Biological Diversity
- The United Nations Framework Convention on Climate Change
- The United Nations Convention on Droughts and Desertification

7.7 MITIGATION MEASURES

In order to protect the environment from the likely adverse effects of forestry projects and programmes there are a number of mitigation measures and management options that may be used. These include the following:

7.7.1 Mitigation Measures Related to General Impacts

- Avoid clearing vegetation on steep slopes
- Limit site preparation to dry season
- Where possible limit use of machinery
- Revegetate cleared forest areas as soon as possible
- Use chemicals with least negative impacts
- Use low impact harvesting equipment and methods
- In order to maintain nutrient cycling discourage whole tree harvesting in forest areas
- Use fast growing intermediate tree crops or mulching for exposed soils
- Develop and maintain inventory of research results on species present in the area
- Limit plantation establishment to degraded sites or sites of low diversity
- Avoid and control species with potential to become weeds
- Discourage monoculture development over large forest areas and encourage species diversity in the indigenous forest areas
- Conserve "islands" of undisturbed forest or natural vegetation
- Select species with pest or disease resistance
- Select appropriate tree species for soil and water conservation
- Provide adequate domestic and logging waste disposal facilities
- Control forest fires

7.7.2 Mitigation Measures Related to Impacts on Human Environment

- Integrate local communities in project planning and implementation
- Conduct socio-economic and resource assessment surveys, in order to enhance sustainable forest management
- Compensate for losses due to forestry projects and programmes
- Develop infrastructure to accommodate increase in population
- Establish clear, long-term jurisdiction over the forests emphasising local participation in decision making
- Involve local leaders in the management of forests to avoid illegal harvesting and settlement

7.8 ENVIRONMENTAL MONITORING AND AUDITING

Environmental monitoring and auditing shall be conducted to verify impact predictions and ensure that mitigation plans are within the environmentally acceptable limits.
The monitorable indicators and means of verification may involve:

- Area and volume of forest resources (Survey Report and GIS maps)
- Forest types (inventory reports and classification displays)
- Degradation rates (composition and density) (Survey and comparison to baseline data/information)
- Forest fragmentation (observations and comparison to baseline data/information)
- Regeneration rates of vegetation(biodiversity assessment, overtime and comparison with types
- that regenerate easily baseline data comparison)
- Rate of conversion of Forest to other uses (percentage lost to each use as exhibited by survey and displayed in GIS or tabulations)
- Flooding at lower parts of a river basin - Soil erosion (muddiness and sedimentation after rain)
- Rates of disappearance of natural forests (survey-comparison with baseline data/information)
- Productivity of forests (productivity types and sustainability (medicine, shelter, timber wood)
- Contribution to GDP (percentage of sector contribution to GDP - revenue accounts)
- Rate of employment in forestry project/programme (number of jobs generated)
- Fuelwood contributed to energy sector (percentage of fuelwood in energy resources)
- Public participation in management of forests (number of communities involved together with their committees)
- Role of women in forestry (number of women programmes and activities)

SECTOR CHECKLIST 8

ENERGY

8.1 SOURCES OF IMPACTS

Certain types of energy programmes and projects have potential to lead to significant environmental impacts. These include major energy projects as outline below:

- Hydro-electric power generation
- Geo-thermal energy generation
- Fossil energy exploitation
- Nuclear energy (mining of radio-active materials, processing and reprocessing of radioactive materials and subsequent disposal)
- Solar energy development
- Wind and wave energy development
- Energy development from waste
- Woodfuel utilization (biomass energy development)
- Biogas production and use
- Tree plantation development
- Electricity transmission projects

8.2 PROJECT INPUTS

- Land (for reservoirs, canals, storage, power generation, waste treatment, power transmission corridors)
- Water (rivers, lakes, reservoirs)
- Fuel (oil and gas)
- Labour (skilled and unskilled)
- Transportation (roads, air, rail, water, port and pipeline)
- Capital
- Plantations (related to energy sourcing)
- Wind
- Solar radiation
- Organic wastes

8.3 PROJECT ACTIVITIES

- Site selection and acquisition
- Project construction activities
- Transportation of raw materials, machinery and labour
- Tree plantation establishment and biomass harvesting
- Alcohol production
- Biogas production
- Collection of fuelwood and crop residues
- Construction of Right Of Wayleaves (ROWs) and transmission lines
- Transmission line routing

- Clearing of vegetation
- Disposal of wastes
- Project operations and decommissioning
- Chemical and mechanical control of vegetation in the ROW.

8.4 AREAS OF IMPACT

Energy production and distribution may have certain ecological and socio-economic impacts on the following natural and human environments.

8.4.1. The Natural Environment

- Atmospheric air
- Soil
- Water Resources
- Protected areas, dispersal areas and buffer zones
- Areas supporting significant biodiversity
- Critical habitats
- Areas of scenic beauty
- Areas already significantly degraded
- Sites of significant cultural or historical importance
- Flora and fauna (rare, endangered and threatened species, species of special concern are species of economic importance[2])

[2]Species of special concern (e.g. Sitatungas, Bongos and sable antelopes) and species of economic importance (e.g. elephants and rhinoes) in Kenya.

8.4.2 The Human Environment

- Human settlements in proximity to the project
- Existing landuse
- Existing provisions of goods and services
- Land tenure systems
- Labour market
- Security of livelihoods/cash income generation
- Traditional livelihoods
- Gender characteristics
- Squatters

8.5 ENVIRONMENTAL IMPACTS

Energy programmes and projects may lead to a number of environmental impacts including:

8.5.1 Impacts on Natural Environment

- Loss of wildlife habitat
- Loss of vegetation cover and complexity
- Loss of Biodiversity
- Encroachment into sensitive and critical environments
- Invasion of exotic species along ROW
- Risks of gas leakages and oil spills
- Deforestation
- Soil erosion
- Siltation of water courses and water bodies Alteration of hydrological patterns Pollution (soil, water and air)
- Acid rain
- Contributes to global warming (emission of greenhouse gases and reduction of carbon dioxide sinks)
- Avian and aircraft hazards from transmission lines and towers
- Increased visual impacts
- Risks of electromagnetic fields associated with electricity transmission
- Risks of land subsidence

8.5.2 Impacts on Environment

- Creation of employment opportunities and increased income
- Development and improvement of infrastructure
- Increased supply of energy
- Flood control regulation
- Improved water supply
- Increased irrigation and industrial development (enhanced food security and employment opportunities)
- Development of reservoir fisheries (improved nutrition and income)
- Improvement in amenity facilities
- Noise pollution
- Loss of land
- Land use conflicts
- Displacement and resettlement of local population
- Increased unplanned secondary development
- Increased pressure on existing resources
- Influx of workers associated with the construction and operation of energy projects (which may lead to changes in local demographic patterns, conflicts with local social and cultural values, existing land uses and increased demand on local services and goods).
- Health problems
- Increased hazards from transmission lines and towers
- Corrosion of buildings and metallic structures

8.6 ENVIRONMENTAL GUIDELINES/STANDARDS

Environmental Guidelines/Standards in the energy sector are meant to assist the EIA Agency, project proponent, EIA practitioners and other interested parties in assessing and determining the significance of environmental impacts.

The pertinent guidelines/standards governing environmental quality with respect to transportation activities include the following:

National Legislation

- The Petroleum (Exploration and Production) Act Cap 308
- Petroleum Act Cap 316
- Kenya Power and Lighting Companies Act Cap 48
- The Water Act, Cap 372
- Lakes and Rivers Act, Cap 409
- River Authorities Act Cap 443
- The Tana and Athi Rivers Development Authority Act, Cap 443
- The Kerio Valley Development Authority Act, Cap 441
- The Lake Basin Development Authority Act, Cap 443
- Ewaso Ngiro South River Basin Development Authority Act Cap 447
- Ewaso Ngiro North River Basin Development Authority Act Cap 448
- The Radiation Protection Act, Cap 243.
- The Factories Act, Cap 514
- The Maritime Zones Act, Cap 371
- Irrigation Act, Cap 347
- WayLeaves Act, Cap 292
- Land Acquisition Act, Cap 295
- The Wildlife (Conservation and Management Act, Cap 376
- The Forests Act, Cap 385
- Antiquities and Monuments Act Cap, 215
- The Fisheries Act No. 5 of 1989
- Plant Protection Act, Cap 324
- The National Museums Act, Cap 216
- Land Planning Act Cap 303
- Pest Control Product Act Cap 346
- Agriculture Act Cap 318
- Government Land Act Cap 280
- Suppression of Noxious Weeds Act, Cap 325
- Chief's Authority Act Cap 128
- Public Health Act Cap 242
- Verru-ment Act Cap 265
- Local Government Act Cap 265

- Tourists Industry Act Cap 385
- Grassfire Act Cap 327
- The Clean Air Act*c
- The Air Quality Standards *d
- The National Drinking Water Standards*a
- The National Effluent (wastewater) Discharge Standards*b

*a The standards are being formulated

*b The standards should be formulated

*c The Clean Air Act is yet to be enacted

*d The standards should be formulated

* The Environmental Management and Coordination Act is yet to be enacted. It will apply in all the areas stated above.

International Guidelines that may be applied

- Agenda 21 the Global Programme of Action on Environment and Development
- ILO Guidelines on Occupational Health and Safety
- USA Occupational Safety and Health Act (OSHA).
- W.H.O. Environmental Guidelines and Standards for Industrial Discharges (1983)
- W.H.O. Drinking Water Guidelines (1982)
- UNEP International Register of Potentially Toxic Chemicals (IRPTC)

International Conventions and Treaties that may apply

- The Ramsar Convention on Wetlands of International Importance especially as waterfowl habitats (1971).
- The United Nations Framework Convention on Climatic Change (1992)
- Bamako Convention on the ban of Trans-boundary Movement of Hazardous Wastes into the continent of Africa
- Basel Convention on the Trans-boundary Movement of Hazardous Wastes (1989)
- World Heritage Convention
- Convention on Biological Diversity (1992)
- Framework Convention on Desertification and Drought (1994)
- CITES Convention on Trade in Endangered Species

8.7 MITIGATION MEASURES

In order to protect the environment from the likely adverse impacts of energy projects and programmes there are a number of mitigation measures and management options that may be used. These include the following:

8.7.1 General Mitigation Measures

- Consider energy efficiency/conservation options
- Consider renewable energy production options for community use

- **Physical plans based on the ecological zones among other factors should be prepared and complied with by all developers to avoid landuse conflicts**
- **Reduce/discourage unplanned settlement**
- **Resettle the displaced people and involve them in resettlement plans.**
- **Control land use in watershed and ensure soil conservation**

8.7.2 Mitigation Measures related to Projects Sitting

- Avoid environmentally sensitive areas, historical, cultural and archaeological sites
- Take into account public health and safety.
- Locate thermoelectric projects in areas with adequate water to minimize thermal pollution Select safe storage and transport modes and routes
- Locate project facilities with gaseous emissions at sites with favourable dispersion characteristics
- Review alternative options.
- For hydroelectric projects, plant appropriate vegetation (trees and grasses) to protect the slopes of the reservoirs
- Avoid locating power transmission lines in important bird habitats and flight routes
- Avoid locating power transmission lines on airport flight paths and areas of human activity.

8.7.3 Mitigation Measures Related to Project Construction

- Limit earth movement and soil exposure to the dry season
- Balance cut with fill
- Resurface and revegetate exposed surfaces
- Reduce noise and dust levels
- Utilize appropriate vegetation clearing techniques in Rights of WayLeaves (ROW)
- Use appropriate methods to control soil erosion
- Provide suitable drainage structure

8.7.4 Mitigation Measures related to Energy Operation

- Take measures to reduce the release of greenhouse gases (through use of appropriate technology and economic instruments e.g. use of environmentally friendly technologies and tax rebates)
- Install air pollution and noise control equipment
- Treat effluent discharges and locate waste disposal sites on impermeable surfaces
- Install oil/water separation drains
- Ensure that appropriate safety and rescue equipment is available
- Provide periodic training and continual safety reminders to all operating staff
- Ensure adequate and regular maintenance of plant and equipment
- Clear woody vegetation prior to reservoir inundation
- Flush/sluice sediments at reservoir exit
- Provide multi-level release to avoid discharge of anoxic water

- Regulate reservoir discharge to minimize salinization and salt intrusion downstream
- Maintain adequate flow for fisheries, provide fish ladders and protect spawning grounds
- Establish reserve areas and buffer zones to preserve wildlife habitat
- Provide for sustainable waste water treatment water reuse and disposal systems
- Promote water conservation measures
- Maintain suitable management of Right of Wayleaves (ROWS) in the power transmission lines

8.8 ENVIRONMENTAL MONITORING AND AUDITING

Environmental monitoring and auditing will be conducted to ensure that the predicted project impacts are within acceptable environmental limits and in order to aid in the improvement of proposed mitigation measures where need be. Monitoring of projects will be done throughout the project cycle up to decommissioning. The following factors will be considered in monitoring:

- Air quality at designated points
- Surface water flow and quality
- Silt loads in affected water bodies
- Effluent discharge upstream and downstream of any receiving body
- Temperature changes in waters on which thermal projects are located
- Seismic vibrations in areas where dams are located
- Changes in fish landings for water bodies affected by damming and water diversion

SECTOR CHECKLIST 9

WILDLIFE MANAGEMENT AND TOURISM

9.1 SOURCES OF IMPACTS

Kenya has some unique ecosystems and a wide diversity of flora and fauna. This forms a base for tourism industry. In essence tourism plays a vital role in the socio-economic development of the nation as a leading foreign exchange earner. Certain types or components of wildlife management and tourism projects, however, have potential to lead to significant environmental impacts. They include the following projects:

- Establishment of National Parks, Game and Marine Reserves and Buffer zones
- Management of protected areas and critical habitats (e.g. wetlands, and forest reserves)
- Commercial exploitation of fauna and flora
- Introduction of alien species
- The hotel industry and associated infrastructure
- Beach development
- Development of protected areas management infrastructure
- Informal sector activities (e.g. handicrafts, kiosks and beach-boys)
- Adventure tourism
- Scientific research/expeditions

9.2 PROJECT INPUTS

- Land
- Capital
- Labour (skilled and unskilled)
- Food and beverages
- Water
- Energy

9.3 PROJECT ACTIVITIES

- Site selection and acquisition
- Planning and site preparation (land clearing, construction of improbation infrastructure and service facilities)
- Development and maintenance of infrastructure within the sector
- Provision of salt-licks and animal baits
- Construction of hotel and associated infrastructure
  - Water supply
  - Sewage disposal facilities
  - Recreational facilities
  - Transmission of energy
  - Tourism services
- Offroad driving
- Wildlife viewing and other tourism resources

9.4 AREAS OF IMPACT

Tourism development projects and programmes may lead to a variety of environmental impacts that include the following:

9.4.1 The Natural Environment

- Areas supporting significant Biodiversity
- Critical habitats
- Protected areas
- Ecologically sensitive areas
- Flora and fauna (rare, endangered and threatened species, species of special concern are species of economic importance)
- Water resources
- Soils and atmospheric air
- Areas of scenic beauty

9.4.2 The Human Environment

- Existing land use and development activities to be displaced or converted
- Land tenure system
- Existing provision of local goods and services
- Labour market
- Traditional Human settlements in proximity to the project area
- livelihoods
- Conflicts in resource use
- Public health and safety
- Cultural and traditional values
- Security of livelihoods/cash income generation
- Gender characteristics

9.5 ENVIRONMENTAL IMPACTS

Wildlife Management and Tourism project and programmes may lead to a number of environmental impacts. These include the following:

9.5.1 Impacts on Natural Environment

- Destruction of unique and sensitive habitats
- Destruction of cultural, historical and archaeological sites
- Degradation of land resources
- Pollution (air, water, vegetation and soils)
- Increased risks of diseases
- Loss of environmental functions provided by the natural systems
- Destruction of beaches and corals
- Soil erosion and siltation

- Loss of rare, endangered, threatened, species of special concern and species of economic importance
- Disturbance to breeding and nesting grounds
- Animal harassment

9.5.2 The Impact on Human Environment

- Increased revenue
- Creation of employment opportunities and increased income
- Displacement of human populations
- Rise in property values beyond the reach of local people
- Erosion of socio and cultural values and traditions
- Secondary development along road and beaches
- Strain on the existing infrastructural services and goods due to influx of people to tourist centres Loss of existence and aesthetic values
- Visual intrusion

9.6 ENVIRONMENTAL GUIDELINES/STANDARDS

National Legislation

- The Wildlife (Conservation and Management) Act, Cap 376
- The Tourist Industry Act, Cap 385
- The Tourist Development Corporation Act, Cap 442
- The Forests Act, Cap 385 of 1989
- Lakes and Rivers Act, Cap 409
- Antiquities and Monuments Act, Cap 215
- The National Museums Act, Cap 216
- The Water Act Cap 372
- The Coast Development Authority Act, No. 20 of 1990
- Maritime Zones Act, Cap 371
- Continental Shelf Act, Cap 312
- The Land Planning Act, Cap 303
- The Fisheries Act, No. 5 of 1989
- The Plant Protection Act, Cap 324
- Public Health Act, Cap 242
- The Government Lands Act, Cap 280
- The Land Control Act, Cap 302
- Pest Control Product Act, Cap 346
- Radiation Protection Act, Cap 243
- Suppression of Noxious Weeds Act, Cap 325
- Science and Technology Act, Cap 250
- Food, Drugs and Chemicals Act, Cap 254

- Mining Act Cap 306
- Local Government Act, Cap 265
- Kenya Bureau of Standards Act Cap*
- Clean Air Act*[c]
- The Air Quality Standards*[d]
- National Drinking Water Standards*[a]
- National Effluent (wastewater) Discharge Standards*[b]

*[a] The standards are being formulated

*[b] The standards should be formulated

*[c] The Clean Air Act is yet to be enacted

*[d] The standards should be formulated

* The Environmental Management and Coordination Act is yet to be enacted. It will apply in all the above.

International Guidelines that may be applied

- W.H.O. Environmental Guidelines and Standards for Industrial Discharges (1983)
- W.H.O. Drinking Water Guidelines (1993)
- W.H.O. Guidelines on Air Quality
- UNEP International Register of Potentially Toxic Chemicals (IRPTC
- FAO's Code of Conduct in Agriculture
- ILO Guidelines
- I.M.0 Guidelines
- Agenda 21 - The Global Programme of Action on International and Development

International Conventions and Treaties that may apply

- The Ramsar Convention on Wetlands of International Importance (1971)
- World Heritage Convention
- CITES Convention on Trade in Endangered Species (1973)
- The United Nations Framework Convention on Climate Change (1992)
- Vienna Convention on Protection of the Ozone Layer (1985)
- Montreal Protocol on substances that deplete the Ozone Layer
- The Convention on Biological Diversity (1992)
- The Eastern Africa Regional Seas Convention
- Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal (1989)
- The Bamako Convention on the ban of Trans-boundary Movement of Hazardous Wastes into the Continent of Africa (1992)*
- The United Nations Convention on the Law of the Sea (1982)
- The Convention for the Prevention of Poilution of the Sea by Oil
- Convention on the High Seas

- The London Convention for Prevention of Maritime Pollution by Dumping of Wastes and Other Matters (1972)
- The London Convention for the Prevention of Pollution from Ships (1973)

9.7 MITIGATION MEASURES

In order to protect the environment from the adverse impacts of wildlife management and tourism project and programmes the following mitigation measures may be taken.

9.7.1 Mitigation Measures Related to General Impacts

- Zone wildlife areas taking into account the natural and social, cultural and economic conditions
- Plan tourist carrying capacity to avoid overburdening existing infrastructure and resources
- Regulate number and size of vehicles in critical habitats
- Diversify visitor activities within certain parks include low impacts pursuits such as walking safaris and viewing wildlife from vantage points or hides
- Improve and develop road networks to distribute tourist loads within parks
- Implement a differential pricing system in parks to ease number of tourists in popular parks
- Plan optimum number of tourist lodges and hotels
- Ensure that lodges and camps maintain adequate standards of waste disposal
- Provide information materials on the uses of and restrictions of tourism resources
- Provide effective wildlife barriers to protect people from injury and damage
- Develop landscaping and building designs to minimise visual intrusion

9.7.2 Mitigation Measures Related to Impacts on Human Environment

- Compensate displaced people taking into account various options such as land for land, and monetary compensation commensurate with the level of negatives socio-economic impacts Assist communities to adjust to the new conditions
- Train tour guides and drivers on the importance and wise use of biodiversity resources
- Encourage community participation in tourism and wildlife management
- Encourage and assist in the establishment of community based enterprise development projects
- Educate tourists to respect local cultural and traditional values

9.7.3 Environmental Monitoring and Auditing

Environmental monitoring and auditing will be conducted to ensure that the predicted impacts are within environmentally acceptable limits. Information gathered through monitoring will be used to improve on the mitigation measures proposed in the EIA. Monitoring of projects and programmes in the wildlife management and tourism sector may involve:

- Effluent and solid waste discharge from hotels and lodges
- Changes in species composition and abundance
- Habitat changes

- Water quality changes
- Conservation area lost through habitat degradation
- Gross Domestic Product
- Number of people employed in the sector
- Number of community based enterprise development projects started and incomes earned
- Number of visitor days to the various categories of parks and reserves
- Number of public outcry reports
- Number of wildlife/human conflict incidents
- Kilometers of wildlife barriers erected

SECTOR CHECKLIST 10

FISHERIES AND AQUACULTURE

10.1 SOURCES OF IMPACTS

Fisheries and aquaculture programmes and projects have the potential to lead to significant and environmental impacts. These include the following:

- Improvement to fisheries
- Aquaculture management
- Industrial fisheries (labour extensive and capital intensive)
- Artisanal fisheries (labour intensive, capital extensive)
- Intensive aquaculture
  - High density culture, artificial feeding
- Extensive aquaculture
- Low density culture, natural feeding
- Introduction of fish species in an area (new and re-introduction)

10.2 PROJECT INPUTS

- Infrastructure development e.g. storage and processing facilities, access roads, ponds, feed processing plant, waste treatment and disposal facilities
- Labour (skilled and unskilled)
- Inputs to processing facilities
- Water supply
- Energy supply
- Plant and equipment
- Capital
- Land
- Fish stock (eggs, fingerlings and mature fish)

10.3 PROJECT ACTIVITIES

- Land preparation
- Construction
- Fish processing and marketing
- Fish stocking
- Fishing
  - Trawling
  - Use of dynamite
  - Immobilisation using certain plants
  - Artisanal fishing
- Activities associated with aquarium fish trade
  - Fish, corals, plants and sand harvesting

10.4 AREAS OF IMPACT

The natural and human environment likely to be affected by fisheries and aquaculture projects and programmes include the following:

10.4.1 The Natural Environment

- *Surface water*
  - Rivers
  - Lakes
  - Reservoirs
  - Ponds
  - Wetlands
  - Coastal waters
- Aquatic flora and fauna, endangered or rare species
- Groundwater

10.4.2 The Human Environment

- Human settlements in proximity to project area
- Existing land use
- Water use rights
- Fishing rights
- Public health and safety
- Labour market
- Food security
- Traditional livelihood
- Socio-cultural values

10.5 ENVIRONMENTAL IMPACTS

The following are some of the environmental impacts which may arise from fisheries and aquaculture project and programmes:

10.5.1 General Impacts on Natural Environment

- Loss of biodiversity due to over-fishing and use of inappropriate technologies
- Habitat destruction
- Damage to coral reefs
- Destruction of vegetation
- Pollution (air, water and land)
- Strain on existing infrastructure
- Increased labour demand
- Labour diversion
- Depletion of wood resources
- Creation of employment opportunities and increased income

- Construction and safety hazards
- Increased foreign exchange earnings
- Disruption of traditional ways of life
- Loss of high quality fish due to displacement by introduced species

10.5.2 Specific Impacts Related to Aquaculture

- Habitat degradation
- Siltation of water courses and water bodies
- Increased risks of waterborne diseases
- More efficient utilization of micro-habitats to enhance food security
- Loss of species diversity and change in productivity
- Indigenous species depletion and extinction due to predation by introduced species
- Conflicts for available water and land resources
- Hydrogen sulphide formation leading to poisoning of aquatic ecosystem
- Disruption of natural tidal flushing, nutrient cycles, fresh water flow and water quality (especially in mangrove ecosystem)

10.6 Environmental Guidelines/ Standards

Environmental Guidelines/standards in the Fisheries and Aquaculture sector are meant to assist the EIA agency, project proponent, EIA practitioners and other interested parties in assessing and determining the significance of environmental impacts. They are a reference point upon which the threshold of impacts can be assessed. The pertinent guidelines/standards governing environmental quality with respect to fisheries and aquaculture activities include the following:

National Legislation

- Fisheries Act No. 5 of 1989
- The Maritime Zones Act, Cap. 371
- The Wildlife Conservation and Management Act, Cap. 376
- The Water Act, Cap. 372
- The Public Health Act, Cap. 242
- Lakes and Rivers Act, Cap. 409
- Rivers Authorities Act, Cap. 443
- Agriculture Act, Cap. 318
- Food, Drugs and Chemical Substances Act, Cap. 254
- Irrigation Act, Cap. 347
- Pest Control Product Act, Cap. 346
- Science and Technology Act, Cap. 250
- Tourist Industry Act, Cap. 385
- Tourist Development Corporation Act, Cap. 382
- Fertilizers and Animal Foodstuffs Act, Cap. 345
- Carriage of goods by Sea Act, Cap. 392

- **Registered Lands Act, Cap. 300**
- **Continental Shelf Act, Cap. 312**
- **Factories Act, Cap. 374**
- Territorial Waters Act, Cap. 371
- Forest Act, Cap. 385
- Radiation Protection Act, Cap. 243
- Merchant's Shipping Act, Cap. 389
- Kenya Bureau of Standards Act, Cap. 497
- Clean Air Act*c
- The Air Quality Standards *d
- National Drinking Water Standards*a
- National Effluent (wastewater) Discharge Standards*b

*a The standards are being formulated

*b The standards should be formulated

*c The Clean Air Act is yet to be enacted

*d The standards should be formulated

* The Environmental Management and Coordination Act is yet to be enacted.

International Guidelines that may be applied

- Water Quality Guidelines for Irrigation, FAO Irrigation and Drainage Paper No.
- F.A.0. Code of Conduct in Agriculture
- European Union Standards (EEC 78/769 and 79/923)
- European Union Waste Water Discharge Guidelines (EEC 76/160, 78/658 and 79/923)
- W.H.O. Drinking Water Quality Guidelines (2nd Edition 1993)
- W.H.O. Air Quality Guidelines
- UNEP International Register of Potentially Toxic Chemicals (IRPTC)
- ILO Guidelines

International Conventions and Treaties that may be applicable

- The United Nations Framework Convention on Climate Change (1992)
- Vienna Convention on Protection of the Ozone Layer
- Ramsar Convention on Wetlands of International Importance especially as waterfowl habitat (1971)
- The CITES Convention on trade in endangered species
- The Convention on Biological Diversity (1992)
- The Eastern Africa Regional Seas Convention
- Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal (1989)
- The Bamako Convention on the ban of Trans-boundary Movement of Hazardous Wastes into the Continent of Africa (1992)

10.7 MITIGATION MEASURES

In order to protect the environment from the likely adverse impacts of fisheries and aquaculture projects and programmes there are a number of mitigation measures and management options that may be used. These include the following:

General Mitigation Measures

- Train local community in leadership, management and organisational skills
- Provide credit facilities
- Involve the interested and affected parties in the entire project cycle
- Provide for containment, treatment and safe disposal of wastes
- Encourage waste recycling into useable products
- Use cleaner technologies in freezing plants (non-CFC cooling agents)
- Improve water use efficiency
- Restrict fish harvesting to allowable fish sizes; and enforce catch quotas, and seasonal harvesting
- Prohibit fishing in fish breeding areas
- Limit entry to fishing areas through licensing procedures
- Discourage use of explosives and large drift nets, poisoning, harpoons and light traps

- Provide adequate resources and equipment for patrols to enforce compliance
- Design anchoring locations for fishing vessels
- Comply with land use planning/zoning regulations
- Control introduction of exotic species
- Promote research and development, through testing and pilot trials prior to large scale introduction of new techniques

Mitigation Measures Related to Aquaculture

- Prohibit pond construction in areas that are ecologically sensitive or have high biodiversity
- Allow for ecologically optimal number of ponds in an area
- Use existing water reservoirs, depressions, and abandoned quarries to stock fish
- Minimise areas to be cleared for ponds
- Stabilize exposed earth works.
- Limit pond construction to dry season to minimise sediment transport to water courses Encourage frequent pond water exchange by periodic flushing
- Control diseases vectors (e.g. through effective water management, clearing of vegetation and use of biological controls)

10.7.3 Environment Monitoring and Auditing

Environmental monitoring and auditing will be conducted to ensure that the predicted project and programme impacts are within the approved project and programme performance standards, and in order to provide early information for mitigation measures.

- The baseline conditions will be established and continuously monitored throughout the project cycle, and upto decommissioning stage
- The monitoring and audit may involve the following:
  - Water quality for suspended solids, oil and grease, dissolved oxygen, nitrogen and coliforms
  - Treatment of waste from fish processing prior to release
  - Pollution from effluent discharged from fish processing
  - Public health issues(including spread of waterborne diseases) in pond areas
  - Effect of pollution on the numbers, diversity and productivity of aquatic flora and fauna and general resource basic degradation
- Coral reef damage
- Siltation of local water courses and coastal areas and its effect on aquatic flora and fauna arising from construction activities or upstream deforestation
- Habitat damage through use of certain equipment and fishing practices.

ANNEX

Example of Check-list for Positive and Negative Environmental Impact of Water Resources Development Projects

The check-list provided below gives a comprehensive guide to the areas of environmental concern which should be considered in the planning, design, operation and management of irrigation drainage and flood control projects.

Project name/location.....

Enumerator's name .....

Assessment: 1st/2nd/ ..... **Date** .....

For each potential Environmental effect place cross (x)	Positive Impacts			Negative Impacts		
	None	Minor	Major	None	Minor	Major
Hydrology						
• Low flow regime						
• Flood regime						
• Operation of dam						
• Water table level						
• Surface water quality						
• Ground water quality						
• Eutrophicatio						
Pollution						
• Noise						
• Agrochemicals						
• Organic pollution						
• Anaerobic effects						
• Gas emissions						
Soils						
• Salinization						
• Soil properties						
• Waterlogging						
• Erosion						
• Soil Fertility						
• Soil Productivity						

For each potential Environmental effect place cross (x)	Positive Impacts			Negative Impacts		
	None	Minor	Major	None	Minor	Major
Sediments						
• Local erosion						
• Hinterland effect						
• River morphology						
• Channel engine						
• Sedimentation						
• Estuary erosion						
Ecology						
• Projects lands						
• Water bodies						
• Surrounding area						
• Valleys and slopes						
• Wetlands and plains						
• Wildlife						
• Vegetation						
• Climate						
Socio-Economic						
• Population change						
• Income						
• Employment						
• Arable agriculture						
• Settlement						
• Recreational sites						
• Historical and archaeologist sites						
• Livestock raising						
• Tourism						
• Infrastructure						
• Fishing						
• Land tenure						

For each potential Environmental effect place cross (x)	Positive Impacts			Negative Impacts		
	None	Minor	Major	None	Minor	Major
Health						
• Water and Sanitation						
• Nutrition						
• Relocation effect						
• Disease effect						
• Disease ecology						
• Disease control						
• Disease hazards						
Imbalances						
• Pests and weeds						
• Animal diseases						
• Aquatic weeds						
• Structural damage						
• Animal imbalances						

SAMPLE MITIGATION MEASURES FOR RESETTLEMENT PROGRAMME

Below is a summary of the types of potential impacts and recommended mitigation measures associated with a resettlement programme in water resources development projects

Impacts	Mitigation Measure
Displacement of population	Early development of an action plan for settlements of affected families in suitable environment
Loss of immobile household assets	Ensure that compensation is adequate for continuance or improvement of current lifestyles. Compensation for buildings on the basis of size and construction materials. Land compensation based on size and quality of land.
Land tenure conflicts	Land adjudication and registration should be carried out in all areas in order to facilitate the management of peripheries of the reservoir area. This can be done before implementation of the project.
Weakening social cohesion	Maintenance of social cohesion through fostering community organization and minimizing dispersal of kinship groups.
Physiological, psychological and socio-cultural stress	Resettlement in a familiar and predictable environment within the vicinity of the reservoir
Ethnic conflicts	Resettle the affected population in areas with the same clans or ethnic groups.
Increasing tension and conflict may worsen security	Provision for increased security in resettlement areas. This will greatly enhance the success of resettlement activities.
Effect on host population	Reduction of competition by strengthening receiving community infrastructure and resources, particularly water supplies, dips; marketing, education and health facilities, pasture and arable land, close monitoring and evaluation of changes in the resettlement environment.
Increased population density in all areas adjacent to reservoir as a result of resettlement	Provision of agricultural and livestock extension services to enable households to cope with the reduction in land available per households to cope with the reduction in land available per household without reduction in living standards.
Reduced food production and food security	Establish a management system for the implementation of resettlement issues.
	Include in its mandate provision for food relief and increased food security, including the provision/organization of extension services as required.
Displacement of people to less productive areas	Ensure that the productive capacity of the land resettled is equivalent to or an increase on that in the original household area.
A feeling of being isolated from benefits accruing from the reservoir area	Provide services within the reservoir area, and especially to resettled households. This should include: treated water supplies, sustainable fuelwood sources, alternative power sources (electricity), dispensaries, schools and improvements to transport and marketing systems.
Tendency for people to return to unmanaged buffer zones	Rename the buffer zone as "Special management Area". Actively manage this area with the twin aims of preventing dam siltation through local soil erosion, and providing benefits to the local people.
Damage to bee-keeping through removal of riverine	Provision of a well managed reservoir Special

vegetation	Management Area within indigenous trees suitable for bee-keeping.
	Provide extension services for bee-keeping. Provide and encourage the use of improved hives less damaging to the environment.
	Instigate a cooperative for marketing of honey and beeswax.
Depletion of firewood	Afforestation of the buffer zone with culturally preferred indigenous trees for fuelwood. Provision of alternative energy sources.
	Encourage development on-farm fuelwood supplies
	In areas outside the Special Management Area classify land by erosion risk. Provide extension services and assistance to combat soil erosion. On areas with steep slopes unsuitable for terraced cultivation, encourage the development of fuelwood plantations.
	Need for ex-situ conservation and gene banks.
Water-borne diseases infection	Reduce contact between humans and their livestock and the waters of the reservoir to minimize transmission of schistosomiasis, malaria and other water-related diseases. Provision of sanitation facilities, protected an treated water supplies at households and/or standpipes. Provision of health education.
Sudden and dramatic increase in demand for building poles and other natural resource derived materials	Ensure provision of building materials from sources that do not deplete the locally occurring natural resources.
Loss of riverine vegetation in the reservoir areas	Species with both economic, household, conservation and aesthetic value should be maintained by in-situ conservation measures. During construction and impoundment construct plant nursery adjacent to final water levels. Collect seeds and live plants from area to be impounded for growth and preservation in nursery. Following impoundment use nursery to re-stock the buffer zone.
Loss of socially and economically useful vegetation components and loss of biodiversity	Afforestation programme based on indigenous trees within the buffer zone would facilitate community dependence on trees of economic and cultural value.
Damage to sites of value	Preservation of the archaeological, historical and cultural sites of value to the communities and potential for tourism, especially in the buffer zone.
Environmental Degradation	Integration of physical and biological conservation measures within improved systems of land use policies, maintaining the carrying capacity of the grazing and arable land.

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United Nations Conference on Environment and Development Agenda 21.

CONDUCTED EIA FIELD WORKSHOPS

RIFT VALLEY PROVINCE
(Kericho Tea Hotel, 21st - 27th May 1995)

Sites Visited

- Fluospar Mining Company - Kerio Valley
- Kenya Ports Authority (KPA) Inland Container Depot Eldoret
- Kirandich Dam - Baringo
- Geothermal Station - Ol Karia, Naivasha

WESTERN AND NYANZA PROVINCES FIELD WORKSHOP
(Golf Hotel, Kakamega, 28th May - 3rd June 1995)

Sites Visited

- Mumias Sugar Company - Nucleus Estate
- Mumias Outgrowers Company Ltd
- Kenya Railways (Kisumu)
- Kenya Marine and Fisheries Institute (Kisumu)
- Nzoia Sugar Company - Bungoma
- Pan African Paper Mills - Webuye
- Kakamega Forest
- Ahero Nationa Irrigation Board (NIB) Rice Scheme

CENTRAL/EASTERN PROVINCES FIELD WORKSHOP
(Green Hills Hotel, Nyeri 11th - 17th June 1996)

Sites Visited

- Old solid dumping site and the proposed new dumping site (Nyeri Municipal Council)
- Kimathi Estate and Green Town Project Nyeri Municipality)
- Tree and Flower Nurseries (Nyeri town)
- Sewerage Treatment Works (Nyeri Municipal Council)
- Treetops Hotel
- Mahiga Soil and Water Catchment Area
- Steel Rolling Milling - Ruiru
- Bulley's Tannary, Thika
- Leather Industries of Kenya
- Kenya Paper Company
- Mwanyani Soil and Water Catchment Area
- Masii Sand Harvesting

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Mr. D.N. M'Itwerandu	-	Kenya Pipeline Company
Captain L.A. Owago	-	Kenya Ports Authority
Mr. P.M. Njuguna	-	Kenya Railways Corporation
Mr. Tom Torome	-	Kenya National Chambers of Commerce and Industry
Mr. J.M. Mutea	-	Ministry of Energy
Rose Ayugi	-	Afriaa Climate Network
Dr. R. Kench	-	Kenyatta University
Mr. C. Idawo	-	National Environment Secretariat
Mr. W. Chebukaka	-	Meteorological Department
Ms. F. Khamalla	-	Ministry of Energy

Mr. Kirimi Thuranira	-	Wildlife Clubs of Kenya
Mr. A. Komora	-	East African Wildlife Society
Mr. F.M. Munene	-	Central Bureau of Statistics
Mr. E.N. Barua	-	Environment Management Services
Mrs. B. Tumbo	-	Ministry of Health
Mr. C. Wanjau	-	Uvumbuzi Club
Mr. Njoroge Ngure	-	African Wildlife Foundation
Ms. Susan Aird	-	Environment Liaison Centre

CHAPTER 4

The EIA Review Process

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The EIA Review Process

4.1 INTRODUCTION

The review of the Detailed EIA Report will be conducted by an independent Review Panel comprising of members from relevant disciplines and chaired by an appointee of the Director General e.g. the Deputy Director of the EIA Department of the Environmental Management Authority.

Objectives

The main objectives of Review for the Detailed EIA Reports on Prescribed Activities are:

(i) To critically review the Detailed EIA Reports
(ii) To evaluate development and environmental costs and benefits in the final project plan
(iii) To formulate supported recommendations to the project Approving Authority relevant to the implementation of the project

Review Criteria

- In reviewing the Detailed EIA Reports important issues to be addressed will include:
- Extent to which the EIA report covers the Terms of Reference presented at the beginning of the study
- Whether the EIA report concurs with the National EIA guidelines
- Extent to which key environmental issues of interest to decision makers have been addressed
- Whether the findings of the report are scientifically and technically sound and organised in a manner that can easily be understood by the decision makers and the general public
- Whether the study properly identified all likely significant adverse environmental impacts of the project as well as mitigation measures for the impacts
- The adequacy of description of the methodology used, techniques applied, assumptions made and limitations encountered
- Whether the study has suggested reasonable alternatives to the proposed action
- The relevance of sources of information cited in the report

Review Parameters

The Review Panel should carefully check if the following parameters among others have been adequately addressed.

Impact Identification

- Does the project have an impact on any environmentally sensitive area?
- Is there a clear statement of significant beneficial/adverse impacts?
- Have the risks been evaluated?
- Has attention been paid to off–site effects, including trans–boundary effects, and to the possible time–lag before effects are manifested?
- Have possible residual impacts been clearly stated?

Mitigation and Abatement Measures.

- What mitigation measures are proposed and what alternative designs or sites have been considered?
- What lessons from previous similar projects have been incorporated into this EIA?
- Are there any significant impact whose mitigation or abatement cannot be prescribed.
- Have interested and affected populations and groups been effectively involved?
- Is adequate consideration given to provision of compensation for loss of damage to property, or for resettlement?

Procedures

- Have the EIA procedures complied with national and sectoral guidelines regulations and terms of reference?
- In which phase of the decision–making process has the EIA been included?
- How have the beneficial and adverse effects of the project been integrated into the economic analysis of the project?

Implementation

- Are institutional arrangements adequate to implement recommended mitigation measures?
- Does the EIA report specify who will be responsible for the monitoring and the standards enforcement programme?
- Have environmental protection measures been costed and are there funds and technical capacity to implement them?

Time Frame

Preliminary Assessment Report review – one to two months
Detailed EIA Report – within three months depending on the complexity and scope of activity.

4.2 The Review Panel

This is an independent body appointed by the Director General from time to time. Its composition will be determined by the nature of the proposed project and will include members form relevant disciplines. The Panel may consult suitable experts for specialist advice on specific aspects of any project under review.

The main functions/responsibilities of the Review Panel are to review Detailed EIA reports and to evaluate the environment and development costs and benefits to the community. It formulates recommendations on which the Approving Authority makes decisions on implementation

For district–based projects the Approving Authority will appoint a Review Panel composed of lead agencies and other interested and affected parties from time to time.

The Review Panel is served by a secretariat whose functions are as outlined below

4.3 Secretariat to the Review Panel

The Director General will have a secretariat to facilitate the review process by providing guidelines for conducting EIA and advising him/her on the constitution of the Panel of Experts.

Basically, the Secretariat will consist of a multi – disciplinary membership including:

- ecologists
- chemists
- sociologists
- lawyers
- engineers
- planners
- economists etc.

Functions/Responsibilities of the Review Panel Secretariat are:

- to provide full–time secretariat to the Review Panel
- to provide standard guidelines and procedure for conducting EIA to project proponents
- to assist the Review Panel in identifying experts for specialist advise and to obtain and compile their contributions
- to undertake any informal consultations with the Project Proponent and the Public as may be directed by the Review Panel
- to review Preliminary Assessment reports and to determine whether or not the project shall be subjected to Detailed Assessment and consult the Approving Authority
- to perform any other duties that may be assigned by the Review Panel from time to time.

4.4 The Panels of Experts

As and when necessary the Review Panel will appoint a Panel of Experts to provide specialist technical or scientific advice on specific aspects of individual projects. These experts may be drawn from interested and affected parties (from both the public and the private sectors). Some kind of register of experts should be maintained by the management.

4.5 Public Participation

Individuals and groups with legitimate interest in or affected by the projects will have unrestricted access to all formal EIA documents unless there are reasons for restriction. The Director General will publish in the Kenya Gazette and local daily newspapers a notification to the general public to inspect EIA study and Review reports. Written comments should be submitted within one month. The comments on Detailed EIA reports will be taken into account by the Review Panel.

4.6 Review Panel Documentation

The EIA department will establish a documentation unit in the Authority. Both hard copies and electronic records of the following EIA and Review documents will be maintained.

- Guidelines and procedure for conducting EIA studies
- Preliminary EIA study Reports
- Comments from the public (interested and affected parties)
- Preliminary EIA study Review Reports
- Detailed EIA study Review Reports

- **Annual Abstracts of EIA studies.**

4.7 Review Process Description

Step 1: Screening

- The Review Panel Secretariat issues EIA guidelines to the project proponent on request
- Screening process using guidelines and/or informal consultations between the project proponent and the Review Panel Secretariat if necessary

The Project then undergoes:

(i) Exemption from EIA – the Approving Authority reviews the selection decision or
(ii) Preliminary Environmental Impact Assessment (PEIA) or
(iii) Detailed Environmental Impact Assessment (DEIA).

Step 2: PEIA Report Review

- The Project Proponent consults with the Review panel Secretariat on environmental data collection. This consultation may also be extended to concerned environment related agencies but should involve the public.

- Consultation with Review Panel Secretariat on Reporting.

- The Report is submitted to Review Panel Secretariat for review (Time frame: 1–2 months)
- The project:

(i) is exempted from DEIA – The Review Panel secretariat makes recommendation to Approving Authority. or
(ii) undergoes DEIA

Step 3: DEIA Report Review

- With the PEIA Report in view, the Review Panel Secretariat prepares Terms of Reference in consultation with the Project Proponent and environment related agencies.

- If necessary, consultations are held between the Assessor (of the Project) and the Review Panel secretariat on choice of methodologies for DEIA.

- Consultation between the Secretariat, the Project Proponent and environmental agencies on environmental data collection. The Assessor maintains consultations with the secretariat and the public to ensure relevance of data collected.

- The DEIA Report is reviewed and simultaneously published to invite comments from environment related agencies and the public

- During the review period consultations are held with the project proponent for clarification as necessary.

- The Draft Review Report recommendations are discussed with the Proponent (Request for

additional data/information may be made to improve the DEIA Report).

- Final Review Report incorporating comments from the public and other interested parties is forwarded to the Approving Authority.