

Environmental Assessment in Tanzania: A Needs Assessment for Training

**Institute of Resource Assessment,
Dar Es Salaam, Tanzania**

and

**International Institute for Environment
and Development, London, UK**

August 1995



Authorship and Acknowledgements

This report was prepared as part of a collaborative initiative between the Institute of Resource Assessment (IRA), University of Dar es Salaam, Tanzania; and the International Institute for Environment and Development, (IIED), UK. The report was prepared by Professor Raphael B.B. Mwalyosi and Dr. Sitna Mohamed (IRA); and Ross Hughes and Dr. Barry Dalal-Clayton (IIED).

We would like to thank the following for their contributions to this report:

Prof. Idris S. Kikula
Prof. Mark Mujwahuzi
Dr. Hussein Sosovele
Dr. Fannuel Shechambo
Bryan C. Spooner
Paul Driver
Dominic De Waal
Annie Donnelly

Many people, too numerous to name individually, kindly gave their time in completing the questionnaires and imparting their experience during the interviews conducted as part of this study.

Finally, we would like to thank the generous support of the Danish International Development Agency (DANIDA) for providing financial support for this study.

Contents

Acknowledgments

1. Introduction	1
Background	1
What is EIA?	1
Why is EIA Important?	2
The Emergence of EIA in Tanzania	2
Institutional Clarity and Political Commitment	2
Public Involvement in Environmental Assessment	2
EIA Training Resources in Tanzania	4
The Study	4
2. EIA in Context: Legislation, Institutional Mandates and Human Resources in Tanzania	6
Background	6
Legislation	6
Institutional Mandates	6
Principal Findings	8
3. A Review of Past Experience of EIA in Tanzania	10
Background	10
Review Approach	10
Principal Findings	11
4. Implications for Training	13
Background	13
Priority Training Needs	13
Determining Priority Target Groups	14
Matching Priority Training Needs with Target Groups	15
References	16

List of Boxes

Box 1	Environmental Legislation, Policies and Standards Relevant to EIA in Tanzanian Mainland	7
Box 2	Environmental Legislation, Policies and Standards Relevant to EIA in Zanzibar	8

Tables

1	Governmental Project Proponents: Mandates to Commission EIA	28
2	Parastatals and Other Institutions: Mandates to Commission EIA	29
3	Organisations with Potential to Provide EIA Services: General	30
4	Organisations with Potential to Provide EIA Services: Universities: a: University of Dar Es Salaam b: Sokoine University of Agriculture	31
5	Organisations with Potential to Provide EIA Services: Non-Governmental Organizations	31
6	Organisations with Potential to Review EIA	32
7	Regional Distribution of Expertise in Natural Resources and Environment Impact Assessment (October, 1994)	33
8	Expertise Available in Each Major Sector of Natural Resource Management (October, 1994)	33
9	EIA Expertise and Experience in Tanzania (October, 1994)	34
10	Experience of the 'Experts' in Tanzania (October, 1994)	34
11	Education Level of 'Experts' Involved Natural Resources and Environment (October, 1994)	34
12	Overall Distribution of EIAs by Indicators and Ratings	35
13	Individual Environmental Impact Statements Rated Against Indicators	35

List of Figures

Figure 1	The EIA Process	3
----------	-----------------	---

List of Annexes

Annex 1	Workshop Participants	18
Annex 2	List of People and Organisations/Institutions Interviewed on EIA	19
Annex 3	Questionnaire on Natural Resources and Environmental Expertise	20
Annex 4	Annotated Bibliography of EIA Statements in Tanzania	24
Annex 5	Indicators and Threshold Levels used in the Review of EIA Statements	27

1. Introduction

Background

The development of environmental impact assessment, or EIA, stems from the implementation of the National Environmental Policy Act (NEPA) of the United States, in 1969. A significant feature of NEPA was the requirement that all development project proposals should be accompanied by an Environmental Impact Statement (EIS) with a clear description of all potential environmental impacts, a discussion of how any adverse impacts could be avoided or mitigated, and identification of alternatives to the proposed project. Following the implementation of NEPA, EIA procedures have been adopted by industrialized and developing countries.

In 1986, the World Bank committed itself to include environmental impact assessment in its project appraisal process, an initiative followed by other multilateral agencies (including the African Development Bank), bilateral agencies and UN agencies. In 1989, the European Community required member states to produce an EIS for proposed development projects and began to recommend the use of such statements by members.

A considerable number of southern countries have now produced national legislation and guidelines but have tended to adopt approaches developed in northern (industrialised) countries. Most bilateral and multinational agencies have also compiled their own guidelines for overseas development projects (Roe, Dalal-Clayton and Hughes, 1995). Emphasis on training in EIA is also increasing.

The application of EIA has now received widespread international acceptance. For example, Principle 17 of the Rio Declaration on Environment and Development, agreed at the 1992 United Nations Conference on Environment and Development, states:

“Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority”.

EIA has evolved considerably over the last two decades, often in response to the context in which it has been used. It is not surprising, therefore, that the methodologies used for EIA in developed countries are not necessarily appropriate, applicable or transferable to developing countries, which may have very different social, cultural and institutional systems. In fact, even the perception of what con-

stitutes a significant impact can vary from one country to another (Biswas and Agarwala, 1992). The Government of Tanzania is currently developing an institutional and legal framework for EIA; but its future implementation implies a need for human resources development to improve the initiation, management and review of the EIA process. Training is also needed to improve and broaden understanding of the potential uses of EIA in the country, and to provide a solid basis on which subsequent in-country training might be developed. But for EIA to be effective in Tanzania, human resources development programmes such as training, and the establishment of institutional and legal frameworks for EIA, will need to be tailored specifically for the Tanzanian context.

This paper reports on Phase 1 of a project aimed at improving in-country EIA training resources. This phase identifies past experience of EIA in the country, assesses current levels and distribution of relevant expertise, and suggests an approach to training which builds on existing resources and experience and is tailored specifically to the Tanzanian context.

What is EIA?

EIA is a structured approach for obtaining and evaluating environmental information prior to its use in decision-making in the development process. A principal objective of EIA is to predict the impacts of development projects and programmes on natural resources and environmental quality, as well as the communities that depend on, or interact with them. It is designed to ensure that the impacts are considered at each stage of project planning and development. EIA is also a tool for collecting and assembling the information that can be used to improve project design and implementation. To achieve these objectives, EIA needs to be process-oriented, multi-disciplinary and interactive, and should aim to provide a better understanding of the linkages between ecological, social, economic and political systems.

EIA is often, and incorrectly, perceived as an instrument of environmental preservation. This may be one reason why its adoption has been relatively slow in most developing countries, including Tanzania. Another misconception is that the production of an EIA report, sometimes referred to as an Environmental Impact Statement, is the principal objective of an EIA procedure.

The term EIA now covers many impact assessment procedures such as social impact assessment, ecological im-

impact assessment and risk assessment. The term *environmental impact assessment* is now widely accepted and used, yet it would be less confusing, and perhaps more appropriate, to refer to the process simply as '*impact assessment*'.

EIA is applied mainly at the project level. However, many components of the EIA process can also be applied to the environmental assessment of plans, programmes and policies, a process that is now widely referred to as *strategic environmental assessment* (SEA). Interest in the use of SEA is now growing, particularly in developed countries such as the Netherlands and Canada. Indeed, the use of SEA in Tanzania might provide a number of important opportunities to avoid unnecessary environmental and social impacts, reduce project costs and improve the quality of development planning in general. Since the concept of SEA is still relatively new and has yet to be introduced in Africa, this paper focuses on EIA. Figure 1 shows the main steps in the EIA process.

Why is EIA Important?

It is now widely accepted that projects which incorporate EIA at early stages of project development tend to be more effective and are often cheaper. Indeed, a recent meeting of African environment ministers accepted that the long term costs of not undertaking EIA can often be higher than the initial financial costs of undertaking an EIA¹. This is because environmental and social implications that are unforeseen or ignored during project planning and implementation, often impact on the project itself, serving to increase capital and recurrent costs, whilst also causing environmental and social damage. On average, an EIA will cost less than one per cent of total project costs, whilst the resulting cost savings are often many times this figure. Whilst the economic benefits that EIA can bring are obviously very significant, unnecessary social disruption can also be avoided.

The Emergence of EIA in Tanzania

There is currently no legal requirement in Tanzania to undertake EIA, although a number of relevant policy initiatives have recently been completed or are underway. A Draft National Environment Policy has recently been compiled for the mainland (MTNRE, 1994a) and an Environmental Protection Bill will soon be discussed by Parliament. Both recommend the use of EIA but, to date, there is no clear statement of institutional responsibilities or procedures and no supporting legislation. It is unlikely that an effective EIA process will be implemented until these are put in place.

¹ *Communique of the African High Level Ministerial Meeting on Environmental Impact Assessment (EIA), Durban, South Africa 24 - 25 June, 1995.*

A National Environmental Policy for Zanzibar was passed by the Revolutionary Council (Cabinet) in August 1991 and officially launched by the President of Zanzibar in July 1993 (COLE, 1992). Legislation to support the implementation of this policy in Zanzibar is currently being prepared, and will include a statutory framework for EIA.

Other relevant policy initiatives include a recent draft National Conservation Strategy for Sustainable Development (NEMC, 1994) and a National Environment Action Plan (MTNRE, 1994b). It is not yet clear how these two parallel processes will be integrated in practice. Both documents recommend the adoption of EIA and establishment of a comprehensive legal framework for addressing environmental issues. Guidelines for EIA in Tanzanian National Parks, together with screening guidelines, have been compiled recently. They are based on the conclusions and recommendations of an EIA workshop held in 1993 (TANAPA, 1993).

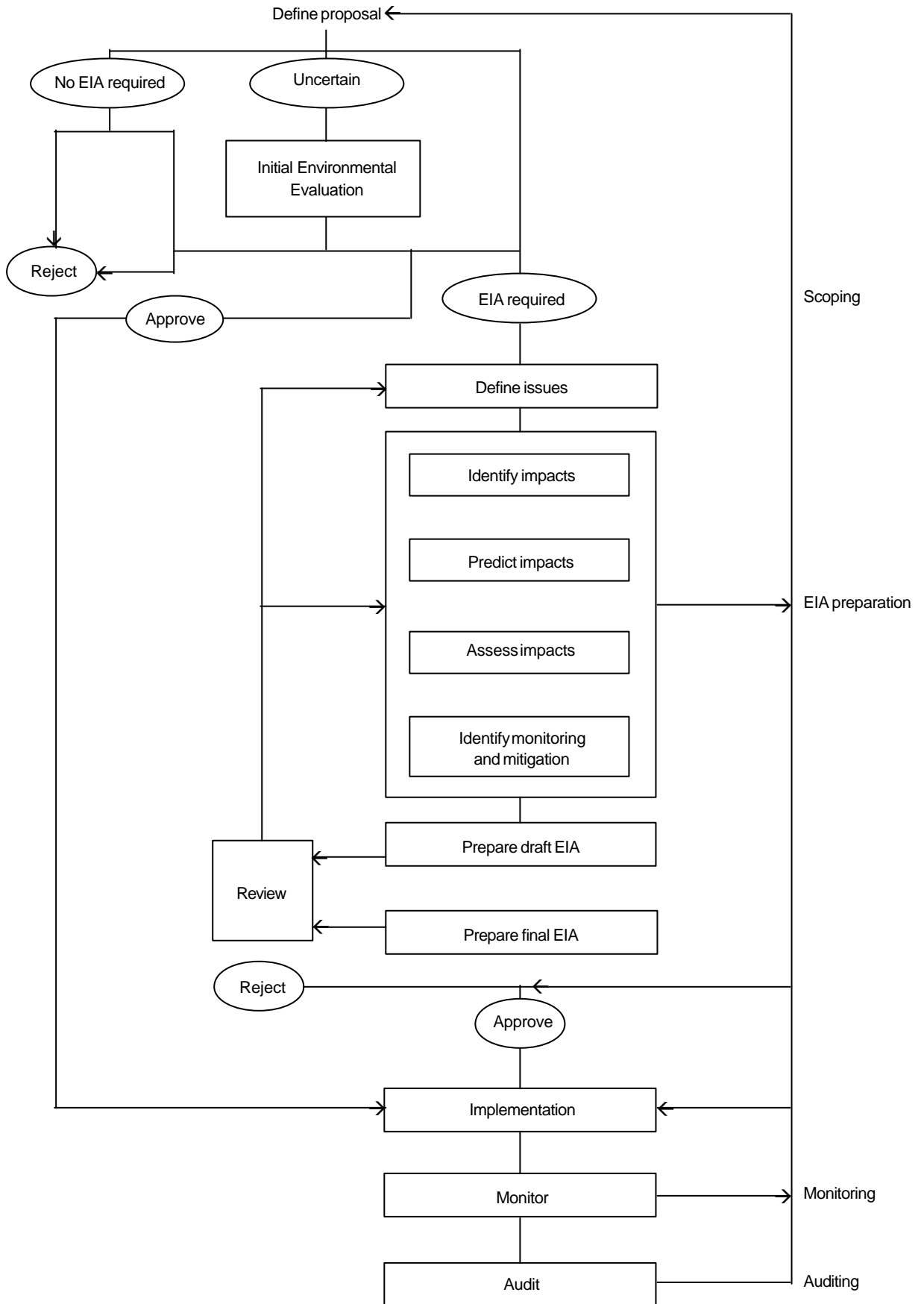
Institutional Clarity and Political Commitment

Experience from developing and developed countries alike indicates that clearly defined EIA legislation, providing for a clear understanding of the EIA process and institutional responsibilities, is a key ingredient for successful environmental assessment procedures. Whilst attention to the issue of institutional responsibilities is of paramount importance, a robust legislative and institutional framework alone will not guarantee good EIA. This can only be achieved if the potential benefits that EIA can bring are recognized, clearly understood and translated into firm political commitment. Such commitment will also be required in Tanzania if the EIA process is to be properly resourced and administered in the long term.

Public Involvement in Environmental Assessment

Traditionally, EIA practitioners have tended to emphasize biophysical issues in EIA whilst paying less attention to social, cultural, public health and even economic aspects (Dalal-Clayton, 1993). The review of past experience of EIA in Tanzania, conducted as part of this study (see section 4), indicates a similar pattern. The failure to address these types of issues has been an underlying cause of project failure in Tanzania and elsewhere (see Lane and Pretty, 1990; Hughes *et al.*, 1994). Indeed, an internal review of World Bank-funded projects found that 30% of projects were deemed to have failed or under-performed, often because of a failure to involve the public and other stakeholder groups (World Bank, 1992).

Figure 1: Stages in the EIA Process (after Wathern, 1988)



The inclusion of greater attention to social, cultural and health aspects in project design implies a far greater need to involve local people and their representatives at all stages of the project cycle. This is easier said than done, although many project planners are now adopting participatory approaches to project planning (such as Participatory Rural Appraisal). EIA provides another opportunity for facilitating such public involvement.

In Tanzania, academics and technocrats have often positioned themselves as representatives of the local population in the belief that the issues involved are too technical for less educated people to cope with. This is a problem that participatory approaches to EIA need to avoid. Indeed, planning and decision-making processes prior to 1972 were characterized by highly centralized and 'top-down' approaches which often exhibited considerable disregard for local communities (Kauzeni *et al.*, 1993). Furthermore, these approaches generally failed to gather and use information relevant to local social and cultural considerations. These shortcomings have not only led to serious and negative impacts at a local level, but have also contributed to the high failure rate of development projects. Examples of projects which failed for these reasons include the Sukumaland Development Scheme for cotton growing and the Mbulu Development Scheme, both of which ignored traditional farming systems (Coulson, 1982).

Entrenched and emerging conflicts over land and water illustrate the need for greater public participation in decision-making. Land alienation for large-scale farms and conservation areas by government and non-governmental institutions (Lane & Pretty, 1990; Mwalyosi, 1991; Yeager & Miller, 1986), have inhibited the expansion of village land and have conflicted with pastoral land-use systems. In urban areas, 'land grabbing' (particularly by wealthy individuals) makes planning difficult and leads to conflict. Since these processes tend to occur more commonly in marginal areas (in both urban and rural settings), land disputes become entangled in ethnic politics (Hoben *et al.*, 1992).

Experience has also shown that development projects imposed on communities often fail to address the types of issues perceived as priorities by those communities and hence fail to engender a perception of local ownership. This leads to a lack of public support (and even conflict) which may often result in project under-performance or total failure. The EIA process provides one framework for incorporating public participation into formal decision-making.

EIA Training Resources in Tanzania

Whilst EIA is now applied routinely to aid-funded development projects, Tanzania lacks adequate expertise and a firm institutional and legal framework for its implementation. The rapid changes in national economic policy (discussed above) add urgency to the need for improvements in domestic environmental assessment capability. To be effective, EIA training needs to be tailored specifically to the national context in which it is to be delivered. For example, training needs for Tanzania will differ significantly from those of Botswana, since the institutional, social, political and cultural context is very different.

The Study

This report is the first output of a three phase study aimed at developing training resources to meet the specific needs of EIA capacity-building in Tanzania. It outlines the findings of an initial review of institutional capacity, the human expertise available to EIA, and the past experience of EIA in Tanzania.

The phase 1 study included:

- a review of the existing legislative framework relevant to EIA;
- a review of institutional mandates related to EIA;
- a review of all available Environmental Impact Statements prepared in the country;
- an assessment of available expertise in disciplines relevant to EIA;
- a review of training courses and training materials available in Tanzania;
- identification of priority target groups for EIA training; and
- preliminary definition of training resources required to meet priority training needs.

The study involved : semi-structured interviews with relevant institutional representatives throughout the country; an extensive questionnaire survey of EIA practitioners and administrators; and the collation and review of environmental impact statements prepared following EIAs conducted in Tanzania over the past 10 years. A workshop was also convened to discuss the current status of training and training needs in Tanzania, and to explore future needs and options. Workshop participants were invited from a broad cross-section of governmental, non-

governmental and private sector organisations, and are listed in Annex 1.

Interviews and data collection were undertaken by the Institute of Resource Assessment (IRA) of the University of Dar es Salaam. Data analysis, review and report preparation were undertaken by IRA in collaboration with the International Institute for Environment and Development (IIED), London, UK.

Phase 2 of the study will involve the preparation of training resources to meet the needs identified and outlined in Phase 1.

Phase 3 of the study will involve the delivery of a pilot training course and the revision of training materials based on the experience gained from the exercise.

2. EIA in context

Legislation, Institutional Mandates and Human Resources in Tanzania

Background

This section reviews the key legislation, institutional mandates and available expertise relevant to EIA (or future EIA implementation) in Tanzania. The review of legislation is based largely on literature surveys, and that of the institutions draws from an extensive programme of interviews with organisations and agencies with an existing or potential interest in EIA (see Annexes 2 and 6).

Three broad categories of institutional mandate are recognised, and each has been assessed on the basis of numbers of staff available with expertise in the EIA process (specifically), and in EIA-relevant disciplines (generally); and on the number of EIAs commissioned, undertaken and reviewed.

The assessment of human resources availability was supplemented by an extensive questionnaire survey of natural resource management expertise distributed throughout Tanzania. Around 1500 questionnaires were distributed to all regions of mainland Tanzania and in Zanzibar (the questionnaire is included in Annex 1). But this survey data has various limitations. The scope of the expertise relevant to different types of EIA is extremely wide, and the survey was not able to cover the whole range. Data was collected from most regions of the country, but resources did not permit a comprehensive survey of expertise within each region. Moreover, a number of regions, particularly the remote ones, are under-represented in this assessment. No responses were received from seven regions (Lindi, Mtwara, Kagera, Tabora, Singida, Ruvuma and Mara). The assessment is based on returns from 353 respondents. A more detailed analysis of the data collected through the questionnaire will be published in due course by the Institute of Resource Assessment.

A great deal of reference information has been collected as part of this review. This is summarised in Boxes 1 and 2, and Tables 1 - 6. The discussion below presents the main findings of the review and draws together their implications for future training needs in the country.

Legislation

Legislation relevant to EIA for the Tanzanian mainland and for Zanzibar is outlined in Boxes 1 and 2, respectively. Whilst the potential benefits of EIA are recog-

nised in Tanzanian national environmental policy, they are not yet reflected in legislation. Indeed, there is currently no legislation to require or support the implementation of EIA in Tanzania, although there is considerable legislation that can help guide and support the enforcement of an EIA framework.

Current environmental policy documents recognise explicitly the need for an effective EIA framework, but they do not include details of institutional responsibilities. Specific legislation is required to clearly state the role of, and responsibilities for, EIA in Tanzania.

Institutional Mandates

This study places institutional mandates in three broad categories; those that commission EIAs, those that undertake EIAs (the 'service providers'); and those that review EIAs. These categories are not exclusive (for example, some reviewers will also commission EIAs).

Project proponents initiate, plan and sometimes implement development projects. They are often government ministries and departments, but may also include private sector companies and development agencies. Within a functioning EIA framework, a project proponent will often be responsible for funding an EIA and also for preparing the Terms of Reference (ToR). Some proponents will also be responsible for undertaking EIA or for selecting the institution to carry out the EIA study. Examples of project proponents (governmental, parastatal and others) and their mandates are listed in Tables 1 and 2.

'Service providers' undertake EIAs or provide inputs to them. Often they are academics recruited on an *ad hoc* basis from universities and colleges, but may also include local and international consulting companies. Tables 3-7 list and describe those organisations with the potential to provide services to support EIA in Tanzania.

'Reviewers' have principal responsibility for ensuring that development proposals are adequately screened and for ensuring that the Terms of Reference for EIA studies match the needs of a proposed project. They are also responsible for ensuring that EIAs are undertaken to a high standard, a process that may require field evaluation and document review. Table 6 lists and describes organisations with potential to contribute to the review of EIA in Tanzania.

Box 1 : Environmental Legislation, Policies and Standards Relevant to EIA in Tanzanian Mainland

Mining

The government policy on all forms of mining is set out in the Mining Act of 1979 and is supported by various mining regulations covering claims, prospecting rights, mining rights and royalties. A recent revision of the Mining Act 1980 requires mining license applicants to submit programmes for environmental protection. The Mining (Claims) Regulations (1980) contain sections which provide environmental controls. For example, each industry is required to establish realistic resource recovery standards and to adhere to them. Also, mining plans must be presented before operations begin.

Water pollution and water supply

The Waterworks Ordinance (Cap. 281); the Urban Water Supply Act, 7/81; and the Water Utilization and Control Act, 42/74, cover water pollution and supply. The Waterworks Ordinance specifies that pollution of water supplies constitutes a punishable offence. The Urban Water Supply Act gives the National Urban Water Authority powers regarding surface or ground water pollution and specifies when such pollution is a punishable offence. The Water Utilization and Control Act establishes temporary standards for receiving waters and effluent discharge standards. The Public Health Sewerage and Drainage Ordinance, Cap. 336, prohibits the discharge of certain substances into sewers, violation of which is an offence and penalties may be imposed.

Several bodies with specific tasks of regulating pollution have been created. These include the National Urban Water Authority, the Central Water Board, the Tanzania Bureau of Standards and the National Environment Management Council (NEMC). Local governments have also been empowered to make by-laws regarding protection of public health and welfare. The Tanzania Bureau of Standards has issued effluent standards for a limited number of specific industries. A National Water Policy was prepared in 1993 and a Sewage and Sanitation Policy is under preparation.

Agriculture

The review of the Agricultural Policy is expected to address issues such as land degradation from agrochemicals. Current donor-supported programmes such as the Land Management Programme (LAMP), the Soil Erosion Control and Agroforestry Programme (SECAP) and the Soil Conservation and Agroforestry Programme (SCAPA) also aim to reduce pollution from agrochemicals.

Land use

Attempts to control land use have resulted in the enactment of numerous statutes and the creation of management institutions. For example, the Town and Coun-

try Planning Ordinance was intended to establish a land use planning scheme for designated areas. The National Land Use Planning Commission was established to advise the government on land conservation and development. The Natural Resources Ordinance created the Natural Resources Board with the responsibility for 'supervising' natural resources. Under the Local (District and Urban) Authorities Acts (1982), Local Authorities are empowered to make by-laws regarding the protection of soil, agriculture, water supplies and other natural resources. Other legislation relevant to land use include the Range Development and Management Ordinance, the Land Ordinance (1961) and the Land Acquisition Act (1967).

Marine and Freshwater Fisheries

Under the Fisheries Act (1970) - which limits annual catches - specific regulations were introduced in 1973 and 1982, putting limitations on methods of fish harvesting, including the outlawing of dynamiting and poisoning.

Wildlife

There is a well defined system of conservation in Tanzania. Wildlife conservation laws are extremely strict in National Parks and Game Reserves, but are less strict in the Game Controlled Areas. The Wildlife Conservation Act protects wildlife and vegetation, by restricting utilization of wildlife to license holders. The use of sensitive wildlife habitats is restricted during certain times of the year or for specific periods. The Wildlife Conservation Act of [1974, amended in 1974],

Legislation limits the exploitation of certain forestry resources by requiring specific licenses for harvesting and/or selling. The revised Forestry Policy of 1993 continues to recognize the important role of forests in the maintenance of the environment, provision of forestry products, and the protection of watersheds and biodiversity.

Air pollution

Atmospheric pollution is addressed only minimally in legislation. The Penal Code stipulates that "voluntarily vitiating the atmosphere so as to make it noxious to the health of persons in the vicinity" is a misdemeanour. The Local Government (District and Urban Authorities Acts, 1982) contain provisions to protect human health and regulate pollution problems. The Merchant Shipping Act 1967 prohibits emission of dark smoke from ships for more than five minutes in any hour, within limits of a port. The Tanzania Bureau of Standards power to approve appropriate production processes which minimize air pollution.

Source: Based on Hitchcock (1994)

Box 2 : Environmental Legislation, Policies and Standards Relevant to EIA in Zanzibar

General

The Act establishing the Commission for Lands and Environment (COLE), gives it powers to take action against people misusing land or causing environmental problems. However, the word "misuse" is not defined, which makes successful prosecution difficult.

Lands

The Land (Distribution) Decree (1966) makes any grant/allocation of land conditional upon good husbandry and soil conservation. However, there is no specific policy on soil conservation to guide the application of this law. A new Land Tenure Act is being developed and will be followed by a programme of surveys to define village boundaries and central government land.

Forests and Vegetation

Legal protection for forests and bush is provided by the Forest Reserves Decree (CAP 120) and, on public land, by the Woodcutting Decree (CAP 121). This protection is limited because bush can be cleared if a permit is secured. Thus, only vegetation within forest reserves is adequately protected. The Forest Department has the mandate to gazette an area as a forest reserve. The forest reserve legislation covers only plants, not animals.

Wildlife

Endangered or rare wildlife species (those that are listed in the IUCN Red Data Books) or those within protected areas, are protected by the Wild Animals Protection decree (CAP 128), but others are not. The Wild Birds Protection Decree (CAP 129) prohibits hunting and trade of many bird species throughout the year, but allows seasonal hunting of some. The decree also provides for the creation of bird sanctuaries.

Fisheries

Fisheries legislation was revised in 1988, and now requires fisheries development plans to be based on available resource data and gives the Minister and the Director of Fisheries wide regulatory powers. For marine conservation, however, many of the important aspects of the law are applied at the discretion of the Director or Minister.

Pollution

Marine Pollution is mentioned in the Fisheries Act, 1988, but there are no specific regulatory provisions. The Towns Act (CAP 79) covered drainage and sewage disposal but this was repealed in 1986 when responsibility passed to local government. New legislation is required.

The Public Health Act (CAP 73) allows control of improper rubbish disposal and of actions which create mosquito breeding spots. Legislative control of industrial wastes and toxic chemicals is inadequate, though to some extent, the latter is covered by the Dangerous Goods Act (CAP 160), which governs port handling, movement and/inflammable substances.

Air pollution is covered by the Road Traffic Decree (CAP 135) which has a general provision against vehicles emitting "avoidable smoke or visible vapour."

Construction

The Town and Country Planning Decree (CAP 85) requires that town plans be adhered to, and it is possible to attach conditions when issuing a lease. Although there is some legislation to protect the foreshore (CAP 105), there is no control on how far from the top of the beach construction can be undertaken. There is also no legislation to control the collection of coral from the sea or inter-tidal zone

Principal Findings

Institutional Mandates

Existing institutional responsibilities and mandates for environmental management tend to be complex, overlapping, poorly defined and sectoral.

As a consequence, policy implementation and legislation enforcement have been ineffective, although attempts are now underway to improve coherence and coordination between institutions.

There exists a broad range of organisations with expertise relevant to EIA in Tanzania. These organisations are located throughout Tanzania and could be drawn upon at various stages of the environmental assessment process. Training should build-on this expertise and seek to turn it

to good effect in EIA. A number of educational organisations have considerable potential to provide training in EIA and in related disciplines once improved training resources are available. However, whilst these organisations have considerable expertise in different sectoral disciplines, 80% of individuals within them have never contributed to an EIA process, and 60% of organisations have no EIA-specific expertise. This implies that training in core 'sectoral' disciplines relevant to EIA (e.g. forest management, agricultural planning) may not be a priority, but 'relating' this expertise to the needs of the EIA process may be a particularly effective strategy.

Experience of commissioning EIA is extremely limited within institutions.

Specific training will be required to improve capacity to commission EIA studies. Only one third of agencies with

the potential to commission EIA studies have so far done so, and expertise levels within each organization are generally poor or non-existent. Awareness of the role that EIA can play amongst commissioning agencies is generally low.

Considerable expertise exists within potential reviewing agencies, but this is unlikely to be sufficient to cope with demand following the enactment of EIA legislation within Tanzania.

Less than 50% of the experts who claimed to have expertise in EIA have reviewed one or more Environmental Impact Statements (EISs). Specialist training to improve the capacity of these agencies to screen projects and review the quality of EIA studies and compliance with terms of reference is urgently needed.

Awareness of the Role of EIA

Recognition of the potential role of EIA in improving project design exists throughout the country.

There is also a widespread belief that a legal framework for EIA framework is an urgent priority in Tanzania.

Common misconceptions exist about the implications of EIA for development planning in Tanzania.

There are many misconceptions amongst senior officials within key institutions. Foremost is the belief that EIA will prove a constraint to development. Fears were also expressed about increased project costs as a result of EIA implementation. EIA is also widely perceived in a rather biodiversity-oriented way.

Human Resources

Expertise and capacity to manage the EIA process is extremely limited, and is thinly spread across different institutions.

To date, EIA studies undertaken in Tanzania have relied heavily on international consultants or on expatriate expertise. This approach has limited the development of domestic capacity to undertake EIA. Whilst the reliance on external expertise has probably had a positive influence on donor-funded projects, the increasing influence of the private sector on national development activities and the enactment of national-level EIA legislation will significantly increase the demand for indigenous expertise.

Most regions suffer from a chronic or total lack of EIA-specific expertise.

Expertise specific to EIA, and relevant to natural resources in general, is concentrated in Dar Es Salaam and, to a lesser extent, Arusha. Nationally, of the 353 respondents with natural resources expertise, only 13% recorded any EIA-specific experience. Importantly, a number of regions appeared to be particularly weak in EIA-specific expertise. This skewed distribution (see Table 7) reflects the fact that all government ministries and most of the national institutions, are located in a few regions, and especially in Dar es Salaam. However, for many aspects of the EIA process, it is in these administrative centres that most expertise is actually required.

Expertise is distributed reasonably evenly amongst a broad range of different sectors.

Table 8 shows a relatively even distribution of expertise across different natural resources management disciplines, although expertise in agriculture and livestock-related disciplines appears to be represented better than in other sectors (e.g. health and sanitation, energy and wildlife management). Since agriculture is the mainstay of Tanzania's economy and provides for the livelihood of the majority of Tanzanians, the extent of agricultural development expertise is perhaps not surprising. There also appears to be substantial expertise in forestry, ecology and environmental planning, each constituting about 20% of the total respondents. There is a notable paucity of expertise in marine sciences and environmental pollution.

Expertise and experience in different aspects of EIA in Tanzania

Expertise levels in different aspects of the EIA process varies considerably (Table 9). Over 60% of respondents claiming expertise in EIA reported experience in environmental monitoring and 48% reported skills in EIA methods and techniques. There is, however, relatively little expertise in environmental law and environmental auditing. The practical experience of the individual respondents in various fields of EIA varies greatly from a minimum of 2 weeks to a maximum of 12 years (Tables 10 and 11). The majority are relatively inexperienced, with less than two years, and only 21% of the respondents have experience of six years or more.

3. A Review of Past Experience of EIA in Tanzania

Background

This section provides a brief and preliminary review of the past experience in carrying out EIA in Tanzania. It is based largely on an assessment of the statements of seventeen EIA studies (Annex 4) which we believe comprise most of those completed to date for projects in Tanzania. Annex 4 provides full details and an annotated bibliography of these documents. Several other EIA studies are currently being planned or implemented. For example, a major EIA process is underway to examine the effects of massive refugee movements in northern Tanzania (UNHCR, 1994).

Review Approach

A semi-structured approach was adopted for data collection to identify broad trends and patterns in the EIA methods used and the quality of the content of each environmental impact statement (EIS). Indicators were used to assess each EIS, and threshold levels used for each indicator are given in Annex 5. However, this approach does have limitations. For example, the quality of an EIS does not necessarily reflect the quality of the EIA process as a whole - superficially high quality statements can be compiled from a poor quality process. Conversely, careful attention to the process of EIA, such as facilitating the involvement of local people, or developing close linkages between the EIA team and the project design team, may not necessarily be reflected in the final impact statement. Therefore, the review should not be taken to represent a critique of the EIA process of each individual study. A more comprehensive approach and the use of field visits would be necessary to evaluate the technical soundness of each of the EISs reviewed. The results of the review are shown in Tables 12 and 13.

(i) *Quality of Terms of Reference*

Good quality, and workable ToR provide guidance throughout the EIA process. For example, they indicate the skills and expertise required within the assessment team, identify and define operational constraints, and issues where specific attention is required (for example, the evaluation of alternative road alignment options). ToR for major EIA studies are often generated by a scoping process (see below) and can then be used to ensure that the full assessment process focuses on issues of particular relevance or importance.

Specific and comprehensive ToR are also important at the review stage. In their absence, it is difficult, if not impossible, to assess whether an EIA process has been undertaken to a sufficiently high standard or, perhaps more importantly, has addressed each of those issues of significance.

(ii) *Screening and Scoping*

Screening and scoping are targeting processes, and are used to ensure that resources available for EIA are used efficiently. Screening identifies those types of projects which are likely to require further assessment. Scoping has been described as the 'lynchpin' of effective EIA (Sadler, 1995). It is used to ensure that all issues likely to be of significance are addressed by the EIA study. Scoping can also help to avoid or minimize the collection of data irrelevant to impact prediction. Collection of information that is not used subsequently in impact prediction often constitutes a significant waste of limited resources. Scoping also provides a crucial opportunity for public participation in the EIA process, and provides one of the best opportunities to consider alternative project options.

(iii) *Statement Clarity*

Experience elsewhere clearly indicates that technically good EIA studies may fail to influence the decision-making process because of poor presentation and communication. Careful report organization, and the inclusion of clear summaries, maps and figures, can improve communication considerably. For many projects, the inclusion of clearly defined recommendations (e.g. the location and design concepts of mitigation measures, alternative route alignments, homesteads at risk from pollution) is vital to project design.

Clear and concise statements should also include:

- an executive summary of the EIA findings;
- a description of the proposed development project;
- baseline data;
- a clear statement of the major environmental and natural resource issues that need clarification and/or elaboration;
- a clear statement of predicted impacts, their likely significance and a rationale of how these conclusions were reached;
- a clear statement of the proposed mitigation measures required;

- a clear statement of those impacts that are likely to remain after mitigation is implemented (the so called residual environmental impacts); and
- a description of the monitoring procedures required to ensure that mitigation and unforeseen impacts are assessed once project implementation begins.

(iv) Quality of Impact Prediction

The principal function of EIA is to provide predictive information on the potential implications of development projects. For this reason, the review assessed the presence and quality of the predictive information included in each statement.

(v) Evaluation of the Significance of Impacts

Most, if not all development projects will have impacts of one kind or another. If informed decisions are to be made, planners will need to be aware of those impacts that are likely to be of particular significance. A wide variety of techniques exist for assigning levels of significance to particular impacts. However, many of these are location- or context-specific, or demand information that is unavailable or inaccessible. Consequently, evaluating significance becomes necessarily qualitative in many cases and, for this reason, the inclusion of the rationale on which evaluations are based is extremely important.

(vi) Assessment of Alternative Options

The assessment of alternative options is an important part of the EIA process since it ensures that the EIA study does not restrict itself to the narrow confines identified by the initial project design. Examples of alternative project options include assessing different routing alignments for linear developments (such as power transmission lines, roads and railways), or considering whether groundwater irrigation should be considered rather than surface water diversion.

(vii) Quality of Mitigation Proposed

Clear proposals are required in every EIA to mitigate potential impacts. Example might include proposals for the inclusion of pollution control technology or design features; or the assessment of alternative sites or working practices during the construction or operation phase of implementation.

(viii) Quality of Monitoring Proposed

Recommendations for monitoring should be designed to provide clear guidance on how the success of proposed mitigation measures can be measured. Ideally, this should be specific enough to provide practical guidance for those

responsible for project implementation. They should indicate the frequency and duration necessary, staffing/ expertise required, etc.

(ix) Involvement of Local People

The importance of involving local people in the EIA process is discussed briefly in section one. Rather little attention appears to have been paid to this matter in EIAs undertaken in Tanzania. In assessing the nature and extent of participation in the EIAs reviewed, we have used four categories of local involvement:

- no local involvement at all;
- meetings with local people, the results of which were usually not described or used in the assessment;
- a consultation process involving discussions or interviews with local people primarily for the purpose of data collection or to inform them of proposed activities - a technique which apparently did not offer local people the opportunity to influence the project activities; and
- participation, whereby local people were encouraged or empowered to suggest alternative options and identify local priorities (or at least clear recommendations were made to that effect).

Principal Findings

Quality of Terms of Reference

In most cases, Terms of Reference (ToR) were not included in the EIS, and only 4 included comprehensive or adequate ToR. A further 13 statements included ToR of a general - rather than specific - nature, and these were often of limited scope or utility. Hence, over three quarters of studies appeared to be undertaken without adequate ToR.

Furthermore, ToR tended to focus attention strongly on the biophysical aspects of the EA, often paying scant attention to other important considerations such as social issues, public health or economic aspects. Despite these shortcomings, not all projects without ToRs produced unfocussed EIS. Conversely, at least one project with specific and detailed ToR did not follow these to any noticeable extent.

The Use of Screening and Scoping

The screening processes used to determine the extent of environmental assessment required were not described in any of the statements reviewed. Nonetheless, all appeared to warrant further assessment, indicating that informal or *ad hoc* screening worked to some extent. None of the EIS statements reviewed contained, or made reference to,

a specific scoping process. One third of statements were characterised by the collection of significant quantities of data which were not used in impact prediction and evaluation. Less than one third of statements appeared to be well scoped and the remaining third only moderately so. Improved scoping could therefore have been used to improve significantly the use of resources, and the quality of the EIA process. It is also worth noting that there were several examples of large, and apparently well-funded studies, collecting large amounts of un-utilized data.

Statement of Clarity

Only one third of statements were well or moderately well presented. Only a few of these made use of summary information, maps and figures. Some statements were 'over-produced', obscuring their messages (perhaps deliberately so!).

Quality of Impact Prediction

Most statements did include predictive information but nearly three quarters of statements did not clearly justify the predictions included in the statements. Only one quarter provided a clear rationale for the predictions made. There was also a tendency to focus on negative impacts of the development project concerned, whilst omitting or giving superficial attention to positive impacts.

Evaluating the Significance of Impacts

Nearly one third of the statements made no attempt to evaluate the likely significance of impacts and only one third provided evaluations that were backed by a clearly defined rationale. Hence, decision-makers were provided with the information required to make informed decisions in less than one third of the statements reviewed.

Assessment of Alternative Options

Nearly one third of the statements made no assessment at all of alternative options available to the project proponents. Just under one half of the statements made some assessment of alternative options, but these were restricted to variations of the same principal design theme (and should really be interpreted as mitigation). Only four statements gave serious attention to assessing the viability of potential alternatives to the initial project proposed.

Quality of Proposed Mitigation Measures

Worryingly, nearly three quarters of the statements did not address mitigation, or failed to present clear or adequate proposals for mitigation. Only two statements provided concise options of sufficient clarity and utility for the project design team.

Quality of Monitoring Measures Proposed

Nearly 90% of statements did not include any recommendations for monitoring, or only presented non-specific monitoring measures. Only one EIA included comprehensive monitoring recommendations.

Involving Local Communities in EIA

Over half of the statements did not address local involvement to any significant extent. One third involved consultation with local people only for data collection or information purposes, and only one study provided recommendations for participation of local people in the EIA process.

4. Implications for Training

Background

The preceding chapters have shown clearly that training will be an essential requirement of any future EIA strategy in Tanzania. The discussion below draws on the findings of the review to identify priority training needs at the strategic and training course level. Key target groups for training are then identified. The section concludes by outlining proposals for the development of three carefully tailored training courses to match target groups with priority training needs.

Priority Training Needs

At a strategic level, EIA training needs to:

Adopt a Flexible Approach

EIA training needs to be flexible and responsive to ongoing policy and institutional changes. The growing importance of the private sector in stimulating development projects, and a trend towards decentralized regulation, implies that EIA training must address issues relevant to small- and large-scale development projects.

Support Indigenous Training Initiatives

Training resources should, wherever possible, be developed and delivered by indigenous institutions. In the long term, this will help ensure that EIA capacity-building becomes enduring and self-sustaining and is tailored to local needs, priorities and contexts.

Improve Awareness of the Role of EIA

EIA training needs to be provided not only for practitioners, but also for improving awareness of the role of EIA at a senior policy level. Such training should clarify the role of EIA in national policy and planning, and redress popular misconceptions.

Harness Existing Expertise

EIA training should harness and build upon the sectoral expertise currently available in the country. Care should be taken to avoid duplicating the role of education and research institutions in developing sectoral expertise.

Address EIA 'Process Management'

Specific attention is needed to improve the capacity of government agencies to commission and review EIA.

Respond to the Needs of Different Regions

Different regions have different levels of expertise and different training needs. There is a particular need to look beyond the urban areas of Arusha and Dar Es Salaam.

At the training course level, emphasis should:

Focus on Improvements in the Commissioning of EIA

Significant improvements in the quality of EIA could be achieved by improvements in the way in which EIAs are commissioned. Section 3 has shown that EIAs need to be commissioned earlier in the project cycle and there is a need to emphasise the importance of clear Terms of Reference to ensure that EIA studies 'ask the right questions'.

Focus on Improving Awareness of the Importance of Scoping

Scoping provides the best opportunity to consider alternative project options and to involve different stakeholder groups, including affected groups and/or local people. Scoping also provides the basis for determining appropriate ToR, and to ensure that the limited resources available to environmental assessment are used effectively.

Focus on Improving the Utility of EIA as a Planning Tool

Section 3 has highlighted the need to place more attention on evaluating the significance of potential impacts, and presenting this in a form that is accessible to decision-makers and stakeholders.

Emphasise the Importance of Considering Alternatives and Mitigation Options

A high proportion of EIAs failed to consider alternative design options or present mitigation measures. This can be a consequence of poor commissioning procedures (eg. by not specifying such requirements in the ToR), insufficient scoping, and the absence of review procedures.

Emphasise The Need to Involve Local People

There is very little experience of involving local people in EIA in Tanzania. In all components of training, emphasis needs to be placed on the benefits that participatory approaches can bring to project design and to local communities.

Focus on the Importance of Process Orientation

More attention is needed to guide the way in which EIAs should be undertaken, the need for interactive and multidisciplinary EIA teams, and the ways EIA can be used to encourage dialogue and the development of consensus between different stakeholder groups.

Determining Priority Target Groups

Supporting EIA capacity-building within Tanzania is constrained by the unpredictable nature of the current political and policy environment. There is also uncertainty regarding the future legislative and institutional framework for EIA. Predicting priority target audiences is therefore an inherently uncertain process. For this reason, the needs analysis has not attempted to tailor training resources to particular institutions, agencies and ministries. Rather, the analysis has identified generic target groups for future training, and these are used as a framework for training resources development. It is recognised that training resources will need to be modified once institutional mandates are clarified.

Different approaches to training are required for each target group. For example, senior administrators will require a clear understanding of the role of EIA and its application to their own area of responsibility, yet they are unlikely to have the time available to participate in lengthy training workshops. Likewise, those with the responsibility for commissioning EIAs, or reviewing the quality of environmental impact statements, will not necessarily require a detailed knowledge of pollution modelling or of the science underlying wildlife management. However, they will require a broad overview of the entire EIA process, and the expertise available within the country that might be harnessed to provide such expertise.

Below we discuss the principal target groups identified by this study, together with different categories of training proposed. Each target group falls broadly within the wider categories discussed earlier ('commissioners', 'service providers' and 'reviewers').

Senior Decision Makers within Central and Regional Government Agencies, the Private Sector and NGOs.

Greater awareness of the potential contribution that EIA can make to improving overall project performance is needed. Government agencies, both central and regional, are one of the key groups of project proponents, particularly for larger development proposals. However, at present, most development projects proceed without environmental assessment of any kind. Awareness training at a senior level is urgently needed to change this pattern of decision-making. As central government relaxes state

control of production, private sector companies and NGOs may increasingly commission EIA studies. Finding mechanisms for providing EIA training to the private sector, perhaps through NGOs such as Agenda-Business Care, will be important.

EIA Review Agencies

In most countries, a particular agency is responsible for ensuring that environmental impact assessment process meets agreed standards. In some cases, this is the responsibility of a government department, whilst in others, a separate commission is given this responsibility. In many countries, review agencies draw upon the expertise of different organisations and agencies, such as university departments, research institutes, NGOs, consultancy organisations and expertise within other government departments.

In Tanzania, there is some expertise of undertaking EIA reviews; but this is thinly distributed amongst a number of agencies, and the depth of experience and competence is unclear. Expertise will therefore be needed to screen development proposals and decide which ones require further attention. They will also need to assess and evaluate whether, in fact, EIAs have been undertaken to an acceptable standard and that they comply with the Terms of Reference. The review agency might also be responsible for coordinating, monitoring and review. To undertake these activities, a comprehensive knowledge of the EIA process as a whole will be required, and the ability to draw upon specialist expertise will also be needed.

Trainers

The review of institutional mandates and human resources shows clearly that most of the sectoral expertise relevant to EIA in Tanzania lies within research and training institutes. Whilst this represents an important source of potential expertise, the review also shows that there is still rather limited expertise in EIA *per se*. This suggests that the EIA training within these organisations - or 'training of trainers', is likely to represent the most productive and efficient way of developing enduring expertise at the national level. The availability of high-quality, widely available training resources, such as case studies, overhead transparencies and exercises, may prove particularly useful to this target group.

Team Leaders

Team leaders have responsibility for several tasks: ensuring that EIA studies address all the key issues outlined in the terms of reference (and other issues considered to be important should these arise); providing coordination between the different members of the EIA team (particu-

larly the sectoral experts); liaising with the commissioning agencies; and ensuring that the technical quality of the EIA meets with acceptable and high standards. Team managers require good management skills, a clear knowledge of the overall EIA process, an ability to understand a broad range of technical issues, and an ability to present information clearly and to a high standard. Training of potential EIA team leaders will therefore require a thorough grounding in the whole EIA process, including elements of EIA review procedures.

Non-Governmental Organizations (NGOs)

NGOs can play a range of different functions in the EIA process. They are often well positioned to facilitate the involvement of local people in decision-making. Technically-orientated NGOs may contribute expertise to EIA studies, provide expert review of completed EIA statements, or even provide specialist training. This implies a requirement for the availability of extremely flexible training requirements.

Matching Priority Training Needs With Target Groups

The following three courses are proposed to respond to the immediate training needs identified above. Each course will be designed to be as interactive as possible, and will employ the use of practical exercises, case studies and innovative training techniques wherever possible. For each course, care will be needed to ensure that a balance of course participants are represented. Indeed, the composition of the training courses should mirror the composition of a multidisciplinary EIA team to ensure that a range of different perspectives are introduced into each training session.

EIA Awareness Training/Introductory Course

The awareness training course should focus on issues pertinent to policy-makers. It should include a brief outline of each stage of the EIA process and should be accompanied by a well-produced course briefing document. The course could also provide an introduction to more in-depth training units. It should not exceed 1 day in length.

The use of supporting video material would be a useful addition to this unit. The target audience for the course would include Ministers, Principal Secretaries, MP's, elected officials of local authorities, Regional Development Directors, Regional Commissioners, and managers of private sector companies and parastatal organisations.

Review Specialist Course

This should focus on developing skills appropriate to man-

aging and reviewing the EIA process. It should build on the introductory course and should target agencies likely to play a role in the management of the EIA process. The course will need to include interactive activities, such as group discussions, case studies and practical exercises in EIA review. The course will also need to ensure that participants become fully aware of existing standards, guidelines and available human resources.

EIA Training Course (the Core Course)

This two week course should form the core of the training programme and should address each main component of the EIA-process in sufficient depth to provide a practical working knowledge for participants. The course should also contain brief introductions to techniques such as cost-benefit analysis, environmental economics, strategic environmental assessment, risk assessment and participatory planning techniques. The course should be aimed at potential EIA practitioners, but it could also act as a refresher course for those with some existing knowledge of EIA. It should also fulfil a 'training-for-trainers' function, for academics in training institutions and training centres; and for NGOs, etc.

The course should be structured around one or more case studies, which will change in accordance with the context of each training course. The course should employ a wide range of different training techniques, including lectures, group exercises and role play, and possibly might also include the use of videos and theatre. The target audience for the course would include: training college staff; university lecturers; consultancy staff; environmental staff from government departments and parastatal agencies; and NGOs.

References

- Bertlin, J. (1993) *Environmental Assessment of Sumbawanga-Mpanda Road: Rehabilitation Proposal (Passing Through Katavi National Park)*. Rukwa Region. Draft Report. Ministry of Works, Tanzania.
- Biswas, A.K. & Agarwala, S.B.C. (Eds.). (1992). *Environmental Impact Assessment for Developing Countries*. Butterworth-Heinemann.
- COLE (1991). *An Environmental Policy and Programme for Zanzibar*. A report prepared by the Zanzibar Integrated Lands and Environment Management Project with funding from the Finnish International Development Agency. Commission for Lands and Environment, Department of Environment, Zanzibar.
- CEEST (1993). *Environmental Impacts of Small Scale Mining: A Case Study of Meralani, Kahama, Nzega, Geita and Musoma* Report Number 1:07/1993, Centre for Energy, Environment, Science and Technology
- Civil & Planning Partnership (1994). *Mtukula-Bukoba-Lusahunga Road. Draft Final Report on the Environmental Impact Assessment*. 3 volumes, Ministry of Works, Communications and Transport, the United Republic of Tanzania. Prepared in association with Scott Wilson Kirkpatrick & M-Konsult Ltd.
- Coulson, M. (1982). *Tanzania: A Political Economy*. Clarendon Press, Oxford.
- Dalal-Clayton, D.B. (1993). *Modified EIA and Indicators of Sustainability : First Steps Towards Sustainability Analysis*. Environmental Planning Issues Number 1. IIED, London.
- Euroconsult/Delft Hydraulics Laboratory (1980). *Identification Study of the Ecological Impacts of the Stiegeler's Gorge Power and Flood Control Project*. Prepared for the Rufiji Basin Development Authority, United Republic of Tanzania.
- Graphtan Limited (1993), *Environmental Impact Assessment of the Mine Development Project, Merelani Block "C", Kiketo District, Arusha Region*. Prepared by Faculty of Engineering, University of Dar es Salaam, Tanzania.
- Halcrow and Partners Ltd. (1992). *Madibira Rice Project, 2nd Draft Environmental Impact Statement*. Prepared for the National Agricultural and Food Corporation, United Republic of Tanzania.
- Hitchcock, L. (1994). *Report on existing legislation pertaining to environment*. United Republic of Tanzania, pp101.
- Hoben, A., Bruce, J. & Johansson, L. (1992). *Rural Land Policy in Tanzania: Issues Paper*. Report Prepared for the World Bank.
- Hughes, R., Adnan, S. & Dalal-Clayton, B. (1994). *Floodplains or Flood Plans? A Review of Approaches to Water Management in Bangladesh*. International Institute for Environment and Development/Research and Advisory Services, London.
- IIED/IRA (1992). *The Environmental Impact of the Proposed Kilombero Valley Hardwood Project, Tanzania. An Assessment of a Project Proposed by the Commonwealth Development Corporation*. Prepared for the Overseas Development Administration, Development Division in East Africa, Nairobi. International Institute for Environment and Development (IIED), London, and Institute of Resource Assessment (IRA), University of Dar es Salaam.
- IRA (1992a). *Environmental Impact Assessment of NORAD Funded Programmes in Tanzania. The Rukwa Integrated Rural Development Programme (RUDEP)*. Prepared for the Norwegian Agency for Development Cooperation (NORAD). Institute of Resource Assessment (IRA), University of Dar es Salaam.
- IRA (1992b). *Environmental Impact of NORAD Funded Programmes In Tanzania. The Road Sector Programme*. Prepared for the Norwegian Agency for Development Cooperation. Institute of Resource Assessment (IRA), University of Dar es Salaam.
- IRA (1993). *EIA of Cathodic Protection Stations in Mikumi National Park*. Prepared for the Tanzania-Zambia Pipeline Limited. Institute of Resource Assessment (IRA), University of Dar es Salaam.
- IRA (1993). *Environmental Assessment of Water Resources Development in Ruvu River Basin - Tanzania*. Prepared by the Institute of Resource Assessment (IRA), University of Dar es Salaam. Japanese International Cooperation Agency (JICA) Tokyo, 1993.
- IRA (1994). *Environmental Impact Assessment of the Ikwiriri-Somanga Road Project*. Final Report . Institute of Resource Assessment (IRA), University of Dar es Salaam.

- Kauzeni, A.S., Kikula, I.S. Mohamed, S.A., Lyimo, J.G. & Dalal-Clayton, D.B. (1993). *Land Use Planning and Resource Assessment in Tanzania: A Case Study*. International Institute for Environment and Development/Research and Advisory Services, London.
- Lane, C and Pretty, J.N. (1990). *Displaced Pastoralists and Transferred Wheat Technology in Tanzania*. Gatekeeper Series No. 20. International Institute for Environment and Development, London.
- MTNRE (1994a). *The National Environmental Policy, United Republic of Tanzania*. First Draft, Division of Environment, Ministry of Tourism, Natural Resources and Environment, Dar es Salaam.
- MTNRE (1994b). *Tanzania National Environmental Action Plan: A First Step*. Ministry of Tourism, Natural Resources and Environment, Dar es Salaam.
- MWCELE (1991) *Zanzibar Urban Water Supply and Development Plan 1991-2015. Preliminary Environmental Assessment*. Draft. Ministry of Water, Construction, Energy, Lands and Environment, Zanzibar (MWCELE)/Finnish International Development Agency. March 1991.
- Mwalyosi, R.B.B. (1991). *Influence of livestock grazing on range condition in south-west Maasailand, Northern Tanzania*. *Journal of Applied Ecology* 29: 581-588.
- NEMC 1994. *National Conservation Strategy for Sustainable Development*. National Environmental Management Council, Dar es Salaam.
- Nikundiwe, A.M., Mzira, G., Ngusara, A. & Benno, B.L. (1992). *Environmental Impact Assessment of the Proposed Construction of an Oil Terminal at Tanga*. Prepared for Scott Bertlin Consulting Engineers and Planners.
- Roe, D; Dalal-Clayton, D.B. and Hughes, R. (1994). *A Directory of Environmental Assessment Guidelines*. Review Draft : November 1994. Environmental Planning Group, International Institute for Environment and Development, London.
- Ross, K. (1992). *Environmental Impact Study of Proposed Development on Changuu (Prison) Island, Zanzibar; Tanzania*. Lonrho Tanzania Ltd.
- TANAPA (1993). *Environmental Impact Assessment Procedure and Screening Guidelines*. Tanzania National Parks, Dar es Salaam.
- TANAPA Planning Unit (1993). *Kilimanjaro National Park. General Management Plan/Environmental Assessment*. Tanzania National Parks. May 1993.
- TANAPA Planning Unit (1994). *Management Zone Plan. Environmental Impact Assessment*. Tarangire National Park Tanzania National Parks. April 1994.
- TANESCO (1994). *Environmental Impact Assessment of the Redevelopment of the Hydro-Electric Power Station at Pangani Falls*. IVO-NORPLAN joint venture. Tanzania Electricity Supply Corporation, Dar es Salaam.
- UNHCR (1994). *Environmental Assessment Report of the Rwandese Refugee Camps and the Affected Local Communities in Kagera Region*. Programme and Technical Support Section, Tanzania. United Nations High Commission for Refugees.
- Wathern, P (Ed.) (1988). *Environmental Impact Assessment: Theory and Practice*. Routledge London and New York.
- World Bank (1992). *Wappenhams Report*. World Bank, Washington D.C.
- Yeager, R. & Miller, N.N. (1986). *Wildlife, Wild Death: Land use and Survival in East Africa*. State University of New York Press/The African Caribbean Institute, Albany. 173 pages.

Annex 1

Workshop Participants

Abbas N A (Ms)	NORCONSULT (Tanzania) Limited
Colin P (Mr)	Commission for Lands and Environment, Zanzibar
Daffa J M (Mr)	National Environment Management Council
Dumea H A (Mr)	Ministry of Agriculture
Gupta S K (Prof)	Ardhi Institute
Haji S H (Mr)	Zanzibar Investment Promotion Agency
Joseph J (Mr)	Tanzania Electricity Supply Company (TANESCO)
Juma S K (Ms)	Liaison Officer, Agenda
Katalihwa M (Mr)	Wildlife Division
Katima J H (Dr)	Faculty of Engineering, University of Dar es Salaam
Kikula I (Prof)	Institute of Resource Assessment
Kulaba S M (Prof)	Ministry of Lands, Housing & Urban Development
Manongi F J (Mr)	Rufiji Basin Development Authority (RUBADA)
Mariki D J (Mr)	Zanzibar Investment Promotion Agency
Marwa P B (Mr)	Ministry of Industries and Trade
Mgeta M S (Mr)	Division of Environment
Mohamed S K (Ms)	Commission for Lands and Environment, Zanzibar
Mohamed S (Dr)	Institute of Resource Assessment
Mujwahuzi M (Prof)	Institute of Resource Assessment
Mwalyosi R (Prof)	Institute of Resource Assessment
Mwamfupe M J (Dr)	Geography Department, University of Dar es Salaam
Mwayawala A E J (Ms)	Tanzania Planning Commission
Mwenye M A (Mr)	Ministry of Agriculture
Ngalo M J (Dr)	Faculty of Law, University of Dar es Salaam
Nyamusika S (Mr)	Tanzania Commission for Science & Technology
Osaki K M (Dr)	Department Curriculum & Training, University of Dar es Salaam
Shauri V D (Mr)	Centre for Energy, Environment, Science & Technology
Shechambo F (Dr)	Institute of Resource Assessment
Simon P (Mr)	Faculty of Education, University of Dar es Salaam

Annex 2

List of People and Organisations/Institutions Interviewed on EIA

Babu M A (Mr)	Regional Development Director, Dodoma Region	Mato (Mr)	Environment and Engineering, Ardhi Institute, Dar es Salaam
Bakobi B	Ag/Director, National Environment Management Council, Dar es Salaam	Mayega M M (Mr)	Regional Agricultural Officer, Dodoma Region
Boshe K T (Mrs)	COSTECH, Dar es Salaam	Mbamba F S M	Director, Zanzibar Investment Promotion Agency
Buzoya P F (Mr)	Ag/Regional Agricultural & Livestock Development Officer, Mwanza Region	Mbaruku J	Principal Secretary, Ministry of Planning, Zanzibar
Chausi (Mr)	Conservator, Ngorongoro Conservation Area Authority	Milinga (Mr)	Regional Irrigation Engineer, Iringa Region
Chijana W D (Mr)	Planning Officer, Dodoma Region	Minia M S	Regional Forestry Officer, Dodoma Region
Chikira P M	Regional Planning Officer, Arusha Region	Mkumbo F (Mr)	Ministry of Trade and Industries
Choqo J B	Ag/Director, Tropical Pesticides Research Institute (TPRI), Arusha	Mmbaga E Y	Tanzania Planning Commission, Dar es Salaam
Haule K L (Dr)	National Soil Services, Mlingano, Tanga	Mohamed A H	Assistant Commissioner/Research, Zanzibar
Horrill C J (Dr)	Ag/Director, Institute of Marine Science, University of Dar es Salaam, Zanzibar	Monqi H S (Mr)	Ag/Director, Division of Fisheries, Ministry of Tourism, Natural Resources and Environment
Issa A	Director, Commission for Lands and Environment, Zanzibar	Moshi AO	Head, Chemical & Physical Department, Tropical Pesticides Research Institute, Arusha
Kajuni R	Planning Unit, Tanzania National Parks, Arusha	Moshi R J (Mr)	Planning Officer, Dodoma Region
Kamasha (Mr) Uyole	Agricultural Centre, Mbeya	Mushi J Z	Planning Officer, Dodoma Region
Kamuzora G K (Mrs)	Tanzania Planning Commission, Dar es Salaam	Mussa U A (Mr)	Ministry of Trade and Industries
Kaole J I C (Mr)	Planning Officer, Dodoma Region	Mutagwaba W K (Dr)	Mining Consultant, State Mining Corporation, Dar es Salaam
Kapingu H P	Ukiriguru Research Training Institute	Mwaisaka F M (Mr)	Regional Planning Officer, Iringa Region
Katima J (Dr)	Department of Process Engineering, University of Dar es Salaam	Mwakalundu G A (Mr)	Commissioner, Ministry of Agricultural & Livestock Development (MALD)
Kibelloh H O (Mr)	Director, Division of Fisheries, Ministry of Tourism, Natural Resources and Environment (MTNRE)	Mwambene (Mr)	Uyole Agricultural Centre, Mbeya
Kitambi (Mr)	Tanzania Forestry Research Institute, Morogoro	Nfantia A E (Mr)	Planning Officer, Dodoma Region
Kulembeka H P	Ag/Director, Ukiriguru Research Training Institute	Ngula D E P	Manager, Research and Development, Tanzania National Electric Supply Company, Dar es Salaam
Kunambi G (Mr)	Ministry of Trade and Industries	Nguli H M	COSTECH, Dar es Salaam
Kunsindah (Mrs)	Tanzania Bureau of Standards, Dar es Salaam	Nijundiwe A M (Prof)	Dean, Faculty of Science, University of Dar es Salaam
Kyando (Mr)	Uyole Agricultural Centre, Mbeya	Njele M Z (Mr)	PCO, Mbeya Region
Kyessi (Mr)	Centre for Housing Studies, Ardhi Institute, Dar es Salaam	Nyitti A (Mr)	Director, Heavy Industries, Ministry of Trade and Industries
Lyazile (Mr)	Uyole Agricultural Centre, Mbeya	Osaki K M (Dr) Head,	Department of Curriculum & Teaching, University of Dar es Salaam
Maagi (Mrs)	Ag/Regional Natural Resources Officer, Mwanza Region	Pallangyo S (Mr)	Regional Wildlife Officer, Dodoma Region
Mafunda D	Tanzanian Commission for Science & Technology (COSTECH), Dar es Salaam	Raiab S	Deputy Princial, MATI, Mlingano, Tanga
Magogo (Mr)	Uyole Agricultural Centre, Mbeya	Rugeiyamu Y L H	Regional Water Engineer, Dodoma Region
Mango (Mr)	National Land Use Planning Commission, Dar es Salaam	Rutiko M (Mr)	Tanzania Investment Bank, Dar es Salaam
Manongi (Mr)	Director of Planning, Rufiji Basin Development Authority, Dar es Salaam	Rutinwa B S	Faculty of Law, University of Dar es Salaam
Manyanza D W	Principle, College of African Wildlife Management, Mweka, Moshi	Semesi A K (Prof)	Head, Botany Department, University of Dar es Salaam
Mariki D J (Mr)	Chief Engineer/Designs, Ministry of Communication and Works	Shempemba J B L	National Food Company, Dar es Salaam
Maro S (Mr)	Land Use Planner, Ministry of Agricultural & Livestock Development (MALD)	Stevenson S	NORCONSULT Tranzania Limited, Dar es Salaam
Marwa P R (Mr)	Ministry of Trade and Industries	Suleiman J	Head, Stone Town Conservation Development Authority, Zanzibar
Mashauri D A (Dr)	Department of Civil Engineering, University of Dar es Salaam	Temu (Mr)	Uyole Agricultural Centre, Mbeya
Mashunda F B (Mr)	Regional Planning Officer, Mbeya Region	Yonazi E	COSTECH, Dar es Salaam

Annex 3 : Questionnaire on Natural Resources and Environmental Expertise

NATURAL RESOURCES/EXPERTISE PROFILE FOR TANZANIA

N.B. PLEASE PRINT OR WRITE IN BLOCK LETTERS*

* Respondents should have a bachelors degree as the minimum qualification to be considered.

1.0 Biodata

Surname _____ First name(s) _____ Other Initials /_/_/_/

Date of Birth /_/_/ /_/_/ /_/_/ /_/_/ Place of Birth _____ Country of Birth _____
(DDMMYY)

Sex: Male/Female /_/_/ Nationality _____ Country of Residence _____
Marital Status: Married/Single /_/_/
Number of Children: /_/_/

2.0 Academic Qualifications

University/College	Dates		Qualifications	Main Subject(s)
	From	To		
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

3.0 Research Experience^(a)

Major Field	Specific Field	Years of Experience	Organisation	Project Description	Out put
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
E.G. _____	_____	_____	_____	_____	_____

4.0 Relevant Research Publications^(b)

- (a) Indicate Four (4) areas of your highest level of competence/experience by putting a Capital letter for the Major Area and a Small letter for the Specific Area (See 5.0 below for the various fields).
- (b) Use additional paper if necessary.

5.0 Research Experience

Please indicate by an asterisk "*" your areas of particular experience/competence

<p>A: ENVIRONMENTAL PLANNING</p> <p><input type="checkbox"/> a Environmental standards</p> <p><input type="checkbox"/> b Integrated strategies</p> <p><input type="checkbox"/> c Land use</p> <p><input type="checkbox"/> d water resources use</p> <p><input type="checkbox"/> e Landscape</p> <p><input type="checkbox"/> f Sectoral strategies</p> <p>B: ASSESSMENT TECHNIQUES</p> <p><input type="checkbox"/> a baseline field surveys</p> <p><input type="checkbox"/> b impact mitigation</p> <p><input type="checkbox"/> c modelling/simulation</p> <p><input type="checkbox"/> e monitoring</p> <p><input type="checkbox"/> f remote sensing</p> <p><input type="checkbox"/> g laboratory techniques</p> <p>C: ENVIRONMENTAL IMPACT ASSESSMENT</p> <p><input type="checkbox"/> a EIA methods</p> <p><input type="checkbox"/> b EIA techniques</p> <p><input type="checkbox"/> c Environmental Economics</p> <p><input type="checkbox"/> d Environmental Law</p> <p><input type="checkbox"/> e EIA Auditing</p> <p><input type="checkbox"/> f Environmental monitoring</p> <p>D: ECONOMICS</p> <p><input type="checkbox"/> a development planning</p> <p><input type="checkbox"/> b financial management</p> <p><input type="checkbox"/> c infrastructure</p> <p><input type="checkbox"/> d macro</p> <p><input type="checkbox"/> e micro</p> <p><input type="checkbox"/> f project appraisal</p> <p><input type="checkbox"/> g public finances</p> <p><input type="checkbox"/> h sectoral analysis</p> <p>E: SOCIETY AND ENVIRONMENT</p> <p><input type="checkbox"/> a attitudes/values/beliefs</p> <p><input type="checkbox"/> b history/anthropology/ethnology</p> <p><input type="checkbox"/> c human ecology</p> <p><input type="checkbox"/> d needs assessment</p> <p><input type="checkbox"/> e socio-economic analysis - micro</p> <p><input type="checkbox"/> f socio-economic analysis - macro</p>	<p>F: COMMUNICATIONS/AWARENESS/INFORMATION</p> <p><input type="checkbox"/> a TV/films</p> <p><input type="checkbox"/> b campaign planning</p> <p><input type="checkbox"/> c library sciences</p> <p><input type="checkbox"/> d photo/AV</p> <p><input type="checkbox"/> e press/Radio</p> <p><input type="checkbox"/> f translation</p> <p><input type="checkbox"/> h writing/editing/production</p> <p><input type="checkbox"/> i public participation</p> <p>G: HUMAN SETTLEMENT AND POPULATION</p> <p><input type="checkbox"/> a demography</p> <p><input type="checkbox"/> b family planning</p> <p><input type="checkbox"/> c housing and shelter</p> <p><input type="checkbox"/> d migration</p> <p><input type="checkbox"/> e land tenure</p> <p><input type="checkbox"/> f resettlement schemes/programmes</p> <p>H: HEALTH/NUTRITION/SANITATION</p> <p><input type="checkbox"/> a disease control strategies</p> <p><input type="checkbox"/> b environmental health</p> <p><input type="checkbox"/> c epidemiology</p> <p><input type="checkbox"/> d hygiene/sanitation</p> <p><input type="checkbox"/> e nutrition</p> <p><input type="checkbox"/> f primary health care/extension</p> <p><input type="checkbox"/> g tradition medicine</p> <p><input type="checkbox"/> h transmission/zoonoses/vectors</p> <p><input type="checkbox"/> i veterinary</p> <p>I: PHYSICAL SCIENCES</p> <p><input type="checkbox"/> a geology</p> <p><input type="checkbox"/> b geomorphology</p> <p><input type="checkbox"/> c hydrology</p> <p><input type="checkbox"/> d meteorology</p> <p><input type="checkbox"/> e pedology</p> <p>K: PROTECTED AREAS</p> <p><input type="checkbox"/> a historic sites</p> <p><input type="checkbox"/> b management/administration</p> <p><input type="checkbox"/> c tourism/recreation</p> <p>M: WILDLIFE CONSERVATION</p> <p><input type="checkbox"/> a animal damage control</p> <p><input type="checkbox"/> b zoos/arboreta/exotic</p> <p><input type="checkbox"/> c introduction/exotic</p> <p><input type="checkbox"/> d utilization/harvest/trade</p> <p><input type="checkbox"/> e wildlife/wildland management</p>
---	---

J: ECOLOGY/BIOLOGY

- ___ a animal ecology
- ___ b animal taxonomy
- ___ c birds
- ___ d mammals
- ___ e amphibians and reptiles
- ___ f aquatic invertebrates
- ___ g fish
- ___ h biochemistry
- ___ i biochemical cycles
- ___ j biogeography/evolution
- ___ k biomass and productivity
- ___ l conservation biology
- ___ m energy budgets/pathways/foodwebs
- ___ o physiological ecology
- ___ p genetics
- ___ q plant ecology
- ___ r plants, lower
- ___ s plants, vascular
- ___ t plant taxonomy

N: MARINE AND FISHERIES

- ___ a aquaculture
- ___ b habitat and species conservation
- ___ c inventory/sensus/surveys
- ___ d taxonomy

P: RURAL DEVELOPMENT

- ___ a appropriate technology
- ___ b baseline studies
- ___ c infrastructure
- ___ d small scale industries
- ___ e societal aspects

Q: INDUSTRY/ENGINEERING/TECHNOLOGY

- ___ c civil engineering/land reclamation
- ___ a marine engineering
- ___ g mineral extraction
- ___ h pulp/paper
- ___ i water engineering
- ___ j control
- ___ l pollution/wastes/recycling
- ___ m siting
- ___ n technology

L: FORESTRY

- ___ a agroforestry
- ___ b entomology
- ___ c forest genetics
- ___ d forest resources
- ___ e harvesting and logging
- ___ f mensuration statistics
- ___ g silviculture
- ___ h utilization/minor forest products
- ___ i watershed management

O: AGRICULTURE/LIVESTOCK

- ___ a adaptive planning
- ___ b agronomy
- ___ c crop pathology
- ___ d crops
- ___ e farming/grazing/ranching systems
- ___ f horticulture and gardens
- ___ g integrated pest control
- ___ h irrigation
- ___ i large stock
- ___ j organic farming
- ___ k rangeland management
- ___ l residue and waste use
- ___ m shifting cultivation systems
- ___ n small stock
- ___ o tillage

R: ENERGY

- ___ a fuelwood/other biomass
- ___ b geothermal
- ___ c human/animal power
- ___ d hydro
- ___ e nuclear
- ___ f oil/gas/coal
- ___ g solar/wind/tidal
- ___ h resource management
- ___ i forecasting/modelling
- ___ j conservation/storage/end use

S: POLLUTION/WASTE - MONITORING CONTROL

- ___ a air
- ___ b biocides
- ___ c noise
- ___ d radioactive
- ___ e solid waste
- ___ f water
- ___ g Liquid wastes

U: INFORMATION SYSTEMS

- ___ a GIS
- ___ b LIS
- ___ c ILWIS
- ___ d other - specify

T: DISASTERS

- ___ a droughts
- ___ b earthquake
- ___ c famine/hunger
- ___ d floods
- ___ e hurricanes
- ___ f monitoring
- ___ g prediction
- ___ h relief/mitigation

6.0 CONTACT ADDRESS

Permanent Address	Temporary Address
Institution/Organization _____ _____ _____ _____ _____ Phone: _____ Telex: _____ Fax: _____ Fax Number: _____ E-Mail _____	Institution Organization _____ _____ _____ _____ _____ Phone: _____ Telex: _____ Fax: _____ Fax Number: _____ E-Mail _____

7.0 EMPLOYMENT

Please Tick appropriately

CURRENT ENGAGEMENT	NATURE OF EMPLOYMENT
Currently employed _____ Currently not employed _____ Employed but Currently on study _____ Employed but Currently on leave of absence _____	Permanent employment _____ Temporary employment _____ On Secondment _____

8.0 AVAILABILITY FOR CONSULTANCY

Can be Available only for short term of up to three months /
 Can be Available for long term of up to two years /
 Not available (n/a) /
 Conditionally/available at a request from my employer /

9.0 Please return the dully filled form to the:-

Director
 Institute of Resource Assessment
 University of Dar Es Salaam
 P.O. Box 35097
 Dar Es Salaam

10.0 INFORMATION

For more information please contact:

Prof. R.B.B. Mwalyosi
 Institute of Resource Assessment
 University of Dar Es Salaam
 P.O. Box 35097
 Dar Es Salaam
 Telex: 41561 Univip-TZ
 Phone: 43393
 43500/8 Ext. 2410
 Fax: 43393

Annex 4

Annotated Bibliography of EIA Statements in Tanzania

The following Environmental Impact Statements and reports for projects undertaken in Tanzania were reviewed during the survey.

Bertlin, J. (1993) *Environmental Assessment of Sumbawanga-Mpanda Road: Rehabilitation Proposal (Passing Through Katavi National Park)*. Rukwa Region. Draft Report. Ministry of Works, Tanzania.

This discussion document explores the rural development and environmental implications of a proposal to upgrade a road currently in a poor state of repair. These considerations are placed within the context of national and regional level environment and development imperatives. The document highlights a number of potential implications for the Rukwa Region and particularly for those on the wildlife resources of Katavi National Park. The report proposes an alternative road alignment to the west of the existing route which would avoid impacting on the national park whilst also providing improved road access to the shores of Lake Tanganyika.

CEEST (1993). *Environmental Impacts of Small Scale Mining: A Case Study of Meralani, Kahama, Nzega, Geita and Musoma* Report Number 1:07/1993, Centre for Energy, Environment, Science and Technology

The report assesses the extent of environmental impacts caused by artisanal mining activities in five selected areas of Tanzania. The focus is largely on water and air pollution with attention drawn to the serious implications of these impacts for human health and environmental quality. The report notes that a number of impacts can occur at considerable distances from the location of the mines. It presents observations and recommendations relevant to environmental legislation and environmental management training, and to mitigating environmental, social and health impacts.

Civil & Planning Partnership (1994). *Mutukula-Bukoba-Lusahunga Road. Draft Final Report on the Environmental Impact Assessment*. 3 volumes, Ministry of Works, Communications and Transport, the United Republic of Tanzania. Prepared in association with Scott Wilson Kirkpatrick & M-Konsult Ltd.

The study assesses the potential environmental impacts of a project to upgrade an existing road in the Kagera region of NW Tanzania. In the absence of a legal requirement or formal framework for EIA in Tanzania, the study was carried out in accordance with the technical and procedural recommendations set out by the African Development

Bank's "Environmental Assessment Guidelines". The report identifies a number of short- and long-term impacts, and concludes that most significant environmental and social impacts can be mitigated or avoided by good construction practice. The assessment includes separate volumes for the executive summary, the main report and for various appendices.

Euroconsult/Delft Hydraulics Laboratory (1980). *Identification Study of the Ecological Impacts of the Stiegeler's Gorge Power and Flood Control Project*. Prepared for the Rufiji Basin Development Authority, United Republic of Tanzania.

This statement, prepared by overseas consultants, addresses the potential environmental impact of the Stiegler's Gorge Power and Flood Control Project on the Rufiji River. A wide variety of potential biophysical and socio-economic impacts were identified together with a wide range of recommendations for future research. The statement is arranged in 4 volumes:

Part I : Summary, Background and Approach to the Study
Part II : Methodology, definition of impact area and resources inventory
Part III: Analysis of physical and ecological impacts
Part IV: Synthesis, evaluation, conclusions, recommendations

Graphitan Limited (1993), *Environmental Impact Assessment of the Mine Development Project, Merelani Block "C", Kiketo District, Arusha Region*. Prepared by Faculty of Engineering, University of Dar es Salaam, Tanzania.

The statement assesses the potential environmental implications of a proposed graphite mine in Kilimanjaro Region, an area previously degraded by mining for semi-precious stones. The report identifies the most significant potential impacts as dust emissions, land clearance and depletion of groundwater resources to provide water for processing. It concludes that mitigation measures can be used for each of these issues and there should be no residual impacts following mitigation.

Halcrow and Partners Ltd. (1992). *Madibira Rice Project, 2nd Draft Environmental Impact Statement*. Prepared for the National Agricultural and Food Corporation, United Republic of Tanzania.

The statement reviews the potential environmental impacts of a proposed irrigated rice scheme in Madibira Ward,

Mbeya region. The area forms part of the Usangu Plains. The study also provides an evaluation of a number of potential variations of the scheme, with an emphasis on biophysical impacts.

IIED/IRA (1992). *The Environmental Impact of the Proposed Kilombero Valley Hardwood Project, Tanzania. An Assessment of a Project Proposed by the Commonwealth Development Corporation*. Prepared for the Overseas Development Administration, Development Division in East Africa, Nairobi. International Institute for Environment and Development (IIED), London, and Institute of Resource Assessment (IRA), University of Dar es Salaam.

This statement provides a detailed analysis of the environmental, economic and participatory issues associated with a proposal of the Commonwealth Development Corporation (CDC) to develop a commercial teak plantation project in the Kilombero Valley, Southern Tanzania. The discussion concludes that it would be preferable for the CDC to develop its teak plantations in accordance with the Tanzania Tropical Forest Action Plan (TFAP). A number of recommendations are made for the modification of the project in order to reduce the potential for serious environmental impacts and to improve the flow of benefits to local communities.

IRA (1992a). *Environmental Impact Assessment of NORAD Funded Programmes in Tanzania. The Rukwa Integrated Rural Development Programme (RUDEP)*. Prepared for the Norwegian Agency for Development Corporation (NORAD). Institute of Resource Assessment (IRA), University of Dar es Salaam.

The Rukwa Integrated Development Programme (RUDEP) is a multi-sectoral development programme funded by NORAD. It places emphasis on providing support through existing institutional structures and on encouraging disadvantaged groups, particularly women, to participate and benefit from the development programme. The overall objective of the programme is to improve the standard of living in the Rukwa region through the support of agriculture, forestry and infrastructure projects. The study comprises an Initial Environmental Assessment designed to identify potentially significant environmental impacts and to recommend measures for mitigation and monitoring.

IRA (1992b). *Environmental Impact of NORAD Funded Programmes In Tanzania. The Road Sector Programme*. Prepared for the Norwegian Agency for Development Cooperation. Institute of Resource Assessment (IRA), University of Dar es Salaam.

The statement provides an assessment of the potential

environmental impacts associated with the Rural Roads Maintenance Programme (RRM) and the Integrated Road Project (IRP), both funded by NORAD. The projects place special emphasis on the involvement of women in the road sector and on the use of human labour, rather than mechanized inputs. The ultimate objectives of these road programmes is to develop a more economically and technically viable means of road construction and rehabilitation whilst paying particular attention to environmental and equity considerations. The report proposes mitigation measures based on detailed analysis of road programmes in Tanga and Mbeya regions.

IRA (1993). *EIA of Cathodic Protection Stations in Mikumi National Park*. Prepared for the Tanzania-Zambia Pipeline Limited. Institute of Resource Assessment (IRA), University of Dar es Salaam.

This relatively brief environmental impact study evaluates the potential environmental implications of establishing five Cathodic Protection Systems (CPS) within the boundaries of the Mikumi National Park. The project was proposed to reduce leakage of oil from an existing pipeline that crosses part of the national park. The statement concludes that only limited impacts will occur as a result of the project and most can be mitigated or avoided through careful project design. It recognizes that the project has the potential to avoid future oil contamination in the National Park.

IRA (1993). *Environmental Assessment of Water Resources Development in Ruvu River Basin - Tanzania*. Prepared by the Institute of Resource Assessment (IRA), University of Dar es Salaam. Japanese International Cooperation Agency (JICA) Tokyo, 1993.

This initial environmental assessment was prepared for a proposed programme of water resources development in the Ruvu River basin. The document describes the biophysical resources of the basin, identifies important trends, and provides an initial assessment of potential environmental and social impacts. It includes general recommendations for water resources development together with some suggestions for further research.

IRA (1994). *Environmental Impact Assessment of the Ikwiriri-Somanga Road Project*. Final Report. Institute of Resource Assessment (IRA), University of Dar es Salaam.

The study predicts the social, cultural, economic and environmental implications of the construction of a road bridge across the Rufiji river and floodplain, including access roads and associated works. The proposed road crossing was located in an environmentally sensitive area,

immediately upstream of the Rufiji Delta. The report concludes that increasing pressure on natural resources, particularly those of the floodplain wetlands and delta, could occur as a result of the increase in accessibility permitted by the bridge. It proposes an alternative routing that could significantly reduce the potential impacts associated with the development.

Ross, K. (1992). *Environmental Impact Study of Proposed Development on Changuu (Prison) Island, Zanzibar; Tanzania*. Lonrho Tanzania Ltd.

This brief study, based on a two day field visit and discussions with individuals in Zanzibar and Kenya, assesses the potential environmental impacts of a tourist lodge development project on Changuu Island (also known as Prison Island), a small islet situated off Zanzibar town. The project also includes a mainland development intended to serve as a reception and base for the Changuu Island tourist lodge. The report recommends that the proposed development should not be implemented in view of its significant potential environmental impacts. It also includes a number of suggestions for mitigating potential environmental impacts.

Nikundiwe, A.M., Mzira, G., Ngusara, A. & Benno, B.L. (1992). *Environmental Impact Assessment of the Proposed Construction of an Oil Terminal at Tanga*. Prepared for Scott Bertlin Consulting Engineers and Planners.

The objective of the study is described as surveying and establishing the ecological features that may be effected in the event of an accidental oil spill from a proposed oil terminal at Tanga harbour.

TANESCO (1994). *Environmental Impact Assessment of the Redevelopment of the Hydro-Electric Power Station at Pangani Falls*. IVO-NORPLAN joint venture. Tanzania Electricity Supply Corporation, Dar es Salaam.

This environmental impact statement covers existing and possible future environmental impacts of the redevelopment of a run-of-river hydropower station at Pangani Falls which lie immediately to the south of the East Usambara Mountains. The report contains overviews and key baseline data, mitigation measures, and recommendations for further action and sustained monitoring. Impacts on a downstream stretch of riverine forest and other impacts on the river regime between the falls and the tailrace canal were identified as the most significant potential environmental impacts. It is pointed out that it is unlikely that these impacts can be mitigated fully. The socio-economic impacts of the project were also evaluated and it was concluded that residual impacts following compensation were unlikely to be significant.

MWCELE (1991) *Zanzibar Urban Water Supply and Development Plan 1991-2015. Preliminary Environmental Assessment*. Draft. Ministry of Water, Construction, Energy, Lands and Environment, Zanzibar (MWCELE)/Finnish International Development Agency. March 1991.

The study outlines a variety of existing processes likely to impact on the quality of groundwater supplies on Zanzibar. The report also assesses the potential environmental impacts of the construction of infrastructure being planned as part of the Zanzibar Urban Water Supply Project and Development Plan.

Other EIA statements

Two further EIA statements, prepared by Tanzania National Parks, were also considered. These were significantly different in structure and character from those described above. Consequently, they were excluded from the analysis. Both statements comprise components of national park management plans and focus largely on biodiversity parameters.

TANAPA Planning Unit (1993). *Kilimanjaro National Park. General Management Plan/Environmental Assessment*. Tanzania National Parks. May 1993.

TANAPA (1994). *Management Zone Plan. Environmental Impact Assessment*. Tarangire National Park, Tanzania National Parks. April 1994.

Annex 5

Indicators and Threshold Levels used in the Review of EIA Statements

Terms of Reference Quality

- * Absent, inadequate or unspecific
- ** Moderate
- *** Comprehensive

Scoping and Screening¹

- * Document poorly scoped. No screening of full range of potential impacts.
- ** Moderate. Document reasonably well focused
- *** Good scoping and emphasis. Addresses most significant information and issues

Statement Clarity²

- * Poor
- ** Moderate
- *** Good

Quality of Impact Prediction

- * No prediction included
- ** Limited prediction (in scope and/or quality). Often without rationale
- *** Adequate attention to prediction, including rationale.

Evaluation of the Significance of Impacts

- * No evaluation of significance of impacts
- ** Limited evaluation, often without supporting rationale
- *** Clear indication of significance provided. Often with supporting rationale.

Assessment of Alternative Options

- * No assessment of alternative options
- ** Limited assessment restricted to design variations for the same project.
- *** Assessment of options for alternative project options and design variations.

Quality of Mitigation Proposed

- * Poor or absent
- ** General (but non-specific)
- *** Clear and specific

Quality of Monitoring Proposed

- * None
- ** Limited
- *** Adequate

Involvement of Local People

- * None or poor consultation (where results of meetings with local representatives are not described or used in the assessment)
- ** Consultation does not extend beyond obtaining information from villagers involved or proposal participation of local communities.
- *** EIA enabled local people to identify priorities, needs and future development/mitigation options as appropriate. If project was preliminary or initial, recommendations for local participation are included.

¹ Assessed subjectively according to level of 'focus' of report, and relevance of data collected to analysis undertaken. Essentially, whether the assessment was asking the appropriate questions?

² This general indicator includes considerations of the quality and clarity of presentation, the logical structure of the statement, the inclusions of maps indicating project layout, location of potential impacts, inclusion of summary tables and impact matrices, etc.

Table 1: Governmental Project Proponents: Mandates to Commission EIA

MAINLAND TANZANIA	
Ministry	Mandate
Ministry of Industries and Trade	Industrial development planning and licensing with due consideration for environmental protection throughout the project cycle.
Ministry of Tourism, Natural Resources and Environment (MTNRE)	Environmental protection and management, natural resource development, conservation, environmental protection, soil reclamation, catchment forestry, village/community afforestation, forest plantation and bee-keeping. Also, regulates resource exploitation and utilization.
Ministry of Agriculture and Livestock Development	Development of agriculture and research on agriculture; animal husbandry; veterinary science; animal diseases; livestock production; and tsetse control.
Ministry of Energy, Water and Minerals	Rational and sustained development of indigenous energy resources and the exploitation of mineral resources with minimal environmental impact; urban and rural water supply analysis; control of water quality for irrigation, industrial and domestic use and sediment analysis. Also responsible for water rights and catchment control.
Ministry of Lands, Housing and Urban Development	Land use; planning and management of land resources; evaluation of existing land use practices; implementation of existing physical plans to prevent urban pollution; investigation of appropriate sanitation technologies; and enforcement of land use and development plans.
Ministry of Communication and Works	Development of construction and transportation systems with due consideration to the environment.
Prime Minister's Office	General jurisdiction over local and regional administration over all development sectors (except mining). Also responsible for: village settlement; soil conservation; village afforestation; rural environmental sanitation; medium-to-small scale projects on fisheries; irrigated agriculture; and disaster relief (e.g. famine and refugee management). The Ministry also houses the Project Preparation Unit responsible for Integrated Rural Development Plans and Water Master Plans.
Ministry of Health and Social Services	Disease prevention and improving life expectancy and health promotion through: environmental sanitation; provision of preventive services; sampling and analyses of pollutants; and the support of traditional medical research. Also responsible for development and implementation of health and environmental policy and control of communicable diseases.
Ministry of Education and Culture	Houses the Department of Antiquities responsible for cultural resources, protected areas, sites, monuments and (historical) towns.
ZANZIBAR	
Ministry of Water, Construction, Energy, and Environment	Houses the Commission of Lands and Environment, responsible for the overall management of lands environmental issues.
Ministry of Regional Administration	Resource management in the regions.
Ministry of Transport and Communication	Development of construction and transportation systems.
Ministry of Agriculture, Livestock and Natural Resources	Preparation of land use plans which strike a balance between cultivation, livestock, rubber plantations, nature reserves and national parks.
Ministry of Health	Environmental sanitation and research on traditional medicine.
Ministry of Trade and Industry	Industrial development planning.
Ministry of Information, Culture, Tourism and Youth	Promoting tourism development
Zanzibar Free Zone Authority	Establishment of economic structures through the operation of a free port and export processing facilities in Zanzibar
Zanzibar Commission of Tourism	Spearheads the implementation of tourism policy, initiates plans and action programmes, creates close coordination and monitors and controls tourism development in Zanzibar.

Table 2 : Parastatals and Other Institutions: Mandates to Commission EIA

MAINLAND TANZANIA	
Institution	Mandate
Rufiji Basin Development Authority (RUBADA) and Tanzania Electric Supply Company (TANESCO)	Both have the statutory right to construct, maintain and operate electricity plants using indigenous natural resources (water, coal, gas, etc).
National Agricultural and Food Corporation (NAFCO)	Large scale commercial production of cereals.
State Mining Corporation (STAMICO)	Development and exploration of mineral resources, including coal. Oversees mining projects up to the point of commercial production, and trades in minerals.
Tanzania Investment Bank	Provides grants and loans to projects in various sectors of the economy.
Tanzania National Parks (TANAPA)	Manages and regulates the use of areas designated as national parks, encompassing natural and cultural resources, fauna and flora, wildlife habitat, natural processes, wilderness quality, and scenery.
Ngorongoro Conservation Area Authority (NCAA)	Responsible for managing multiple-land use activities in the Ngorongoro Conservation Area. Encompasses: the conservation of natural resources and environment; the provision and development of facilities for tourists; the development of human residents; and the conservation and protection of archaeological sites.
Small Industries Development Organization (SIDO)	A promotional agency established to support the small scale industrial sector.
Tanzania Petroleum Development Corporation (TPDC)	Responsible for oil industry development; exploration and development of petroleum resources and natural gas; and the operation of wells and refineries.
Commonwealth Development Corporation (CDC)	Operates large-scale tea and wattle estates especially in Iringa Region and has also embarked on teak plantation development in the Kilombero Valley.
Donor Agencies	Bilateral donors, multilateral development banks and UN agencies have requirements for EIAs of certain categories of projects which they support.
Private Sector	With trade liberalization in Tanzania, the private sector is expected to get involved in industrial development
ZANZIBAR	
Zanzibar Free Zone Authority	Establishment of economic strategies through the operation of a free port and export processing facilities in Zanzibar.
Zanzibar Commission for Tourism	Spearheads the implementation of tourism policy, initiates plans and action programmes, creates close-coordination, and monitors and controls tourism development in Zanzibar.
Donor Agencies	Bilateral donors, multilateral development banks and UN agencies have requirements for EIAs of certain categories of projects which they support.
Private Sector	With trade liberalization in Tanzania, the private sector is expected to get involved in industrial development

Table 3 : Organisations with Potential to Provide EIA Services: General

Ardhi Institute	Provide services and facilities for the study of, and training in, land surveying, planning and building construction. Also conducts training programmes and engages in research including EIA.
College of African Wildlife Management, Mweka	Provide services and training in wildlife and protected area management. Training is targeted at middle-level operational staff in Anglophone Africa, e.g. wardens and park managers.
National Institute for Medical Research	Undertakes medical research in Tanzania on bilharzia, intestinal parasites, diarrhoea diseases, malaria, river blindness, filariasis, plague, sleeping sickness and tuberculosis.
National Soil Services, Mlingano, Tanga	Responsible for soil inventory and survey and provides consultancy services. Future plans include the production of 1:1000000 scale maps and the provision of information on soil fertility. The organization currently maintains the Soil Information Systems for Tanzania (SISTAN).
Serengeti Wildlife Research Institute	Responsible for research on wildlife in all conservation areas in Tanzania, including bees.
Tanzania Fisheries Research Institute	Responsible for fisheries research in both fresh and marine waters, and provides data and information for planning and management within the fisheries sector. The Institute also provides information on fish stocks, sustainable yields, appropriate fishing technology, fishing grounds, processing and marketing techniques.
Tanzania Forestry Research Institute	Responsible for forestry product research, research on timber species and silvicultural research. Also provides consultancy services.
Tropical Pesticides Research Institute	Conducts pollution research and monitoring in soil, foods and animal feeds. TPRI is also responsible for the registration of all chemicals, and houses the National Herbarium and the National Plant Quarantine Centre.
Uyole Agricultural Centre	Promotes rural development in the Southern Highlands of Tanzania (Mbeya, Iringa, Rukwa and Ruvuma regions) through applied research.
Commercial Consultancy Companies	A number of commercial consultancy companies have provided services and expertise for EIA in Tanzania. Most of these are foreign-based, and often second expertise from existing Tanzanian institutions, such as colleges, training institutes and universities.

Table 4a: Organisations with Potential to Provide EIA Services : University of Dar Es Salaam	
The Faculty of Engineering	Houses the Departments of Civil Engineering and the Department of Chemical and Process Engineering. The former is planning to introduce the Water, Waste Water and Environmental Management course at a Masters level.
The Faculty of Arts and Social Science	Houses the Economics Research Bureau which includes agriculture and rural development, land use planning and environmental studies.
The Faculty of Science	Offers training directly related to natural resources and conducts research and consultancy work. In addition, the Zoology Department offers degrees and provides consultancy services in marine biology, oceanography, wildlife ecology and wildlife management.
The Faculty of Law	Offers degrees and provides services on land law. The introduction of Environmental Law to the curriculum is currently under consideration.
The Institute of Resource Assessment	Conducts applied research and provides consultancy services to government ministries, and to parastatal, private and international organizations. Has undertaken a range of EIAs. Plans to Offer EIA training courses.
The Institute of Marine Sciences	Offers consultancy services in marine biology and oceanography. Has participated in some EIAs.
Department of Geography	Offers courses and services on land use planning and environmental studies. The department has revised its course content in order to offer all basic courses on EIA for 2nd and 3rd year students.
Muhimbili University College of Health Science	Houses the Institutes of Public Health; Traditional Medicine; and Allied Health Sciences.

Table 4b. Organizations with Potential to Provide EIA Services: Sokoine University of Agriculture (SUA)	
The Faculty of Agriculture	Offers training in animal science and production, crop science and production, rural economy, agricultural engineering and soil science, food science and technology and agricultural education and extension.
The Faculty of Veterinary Medicine	Offers veterinary training in anatomy, physiology, biochemistry, pharmacology, pathology, veterinary medicine and public health, surgery, obstetrics and reproduction.
The Faculty of Forestry	Offers training in forest biology, forest engineering, forest mensuration and management planning and forest economics and wood utilization.

Table 5 : Organisations with Potential to Provide EIA Services : Non-Governmental Organizations	
AGENDA/Business Care Services	Undertakes feasibility studies for Business Care Services; promotes environmentally friendly industrialization in Tanzania; seeks to promote environmental considerations in the financial services sector; supports consumer groups in demands for environmentally- friendly industries and goods; and works towards encouraging the business community to voluntarily adopt environmental codes and standards.
Centre for Energy, Environment, Science and Technology (CEEST)	Established to foster research, development, analysis, information and expertise in matters related to energy, the environment, water and sanitation, science and technology.
Environmental Society of Tanzania	Promotes education in the appropriate use of natural resources and the need for environmental protection.
Journalists Environmental Association Tanzania (JET)	Promotes public awareness of environmental problems and sustainable development, and conducts research and studies on environment, women issues and development in general.
Others	There are a wide variety of other NGOs which act as lobby or pressure groups or provide data and information which might be relevant for EIA. This category includes international NGOs which have offices in Tanzania or elsewhere in East Africa, e.g. World Wide Fund for Nature (WWF), African Wildlife Foundation (AWF), World Conservation Union (IUCN), and the Frankfurt Zoological Society. Large numbers of NGOs work at local level throughout the country

Commission for Science and Technology (COSTECH)	Responsible for the coordination and promotion of scientific research and technology development. COSTECH is also the chief advisor to government on all matters pertaining to science and technology and their application to national socio-economic development.
Investment Promotion Centre (IPC)	Responsible for the encouragement of private investment on the Mainland as part of an effort to support sustained economic development. The IPC is a one-stop-facility for processing investment proposals made by potential investors.
National Environment Management Council (NEMC)	An advisory body to the Mainland government on all matters relating to the environment. It has an exceptionally broad range of duties which include: policy formulation, review, coordination and guidance; the stimulation of public participation in programmes and activities; specifying standards and norms; establishing and operating a documentation system; formulating proposals for legislation; establishing and maintaining liaison with other national and international organizations; and undertaking general environmental education programmes. Other responsibilities include: initiating steps for the protection of the environment and for preventing, controlling, abating or mitigating pollution; and planning projects in environmental management and protection.
National Land Use Planning Commission (NLUPC)	Responsible for advising the government on all matters related to land use. Among the many functions of the Commission, the most relevant are: formulating policy on land use and recommendations for its implementation; recommending measures to ensure that government policies on development and conservation take account of their effect on land; specifying standards, norms and criteria for the protection of beneficial uses and the maintenance of the quality of land; and establishing and maintaining liaison with the land advisory committees in the districts and regions, particularly with respect to issues and matters related to land use planning. The Commission is also responsible for ensuring that national and local interests in land use are taken into consideration; preparing regional physical plans and ensuring their implementation at a regional level.
National Planning Commission	Responsible for planning and managing the national economy of the Mainland. The Commission is an independent department of Government under the Office of the President. It is the highest advisory body to the Government with powers that include: to provide ministries, regions and districts with directives relating to planning and management of the economy; and to direct and specify priority activities for investments.
The Zanzibar Commission for Lands and Environment (COLE)	Responsible for policy formulation, monitoring and coordination of environmental issues in Zanzibar.
Zanzibar Investment Promotion Agency (ZIPA)	Responsible for the protection of investors and their investment projects in Zanzibar. ZIPA also assists in the investment approval and implementation process.

Table 7: Regional Distribution of Expertise in Natural Resources Management and Environment Impact Assessment in Tanzania (October, 1994)

REGION	Respondents with Natural Resources Management Expertise		Respondents with Expertise Specifically Relevant to EIA	
	No.	%	No.	%
ARUSHA	58	16.8	8	18.2
DAR ES SALAAM	121	35.1	24	54.5
DODOMA	10	2.9	2	4.5
IRINGA	7	2.0	1	2.3
KIGOMA	7	2.0	0	0.0
KILIMANJARO	54	15.7	2	4.5
MBEYA	18	5.2	1	2.3
MOROGORO	21	6.1	2	4.5
MTWARA	1	0.2	0	0.0
PWANI	8	2.3	0	0.0
RUKWA	4	1.1	0	0.0
SHINY ANGA	3	0.8	1	2.3
TANGA	21	6.1	0	0.0
ZANZIBAR	12	3.5	3	6.8
TOTAL	345	99.8	44	97.9

Table 8 : Expertise Available in Each Major Sector of Natural Resource Management in Tanzania (October, 1994)

Sector / Field	Number of Responses	Percent
1. Agriculture/Livestock	123	11.8
2. Forestry	78	7.5
3. Assessment Techniques	76	7.3
4. Ecology/Biology	72	6.9
5. Society and Environment	70	6.7
6. Environmental Planning	68	6.5
7. Economics	67	6.4
8. Rural Development	61	5.8
9. Industry/Engineering/Technology	61	5.9
10. Health/Sanitation/Nutrition	49	4.7
11. Environmental Impact Assessment	44	4.2
12. Energy	41	3.9
13. Communication/Awareness/Information	34	3.3
14. Protected Areas	34	3.3
15. Human Settlement and Population	29	2.8
16. Wildlife conservation	27	2.6
17. Physical sciences	26	2.5
18. Pollution/waste control	26	2.5
19. Information systems	22	2.1
20. Marine fisheries	20	1.9
21. Disaster response and management	12	1.1

Field	Number of responses	Percent of Total Responses (44)
Environmental Monitoring	28	64
EIA Methods	21	48
EIA Techniques	15	34
Environmental Economics	13	30
Environmental Law	6	14
EIA Auditing	5	11

YEARS OF EXPERIENCE	No of Respondent	Percent
< 3 Years	14	50.0
3 - 5 Years	8	29.0
6 + Years	6	21.0
Total	28	100.0

LEVEL OF EDUCATION	No of Respondents	Percent
B.Sc.	152	44.0
M.Sc.	157	46.8
Phd.	34	10.0
Total	343	100.0

Rating	*		**		***	
Indicator	% ¹	No. ²	% ¹	No. ²	% ¹	No. ²
Quality of terms of reference	63	10	13	2	25	4
Scoping and screening	33	5	40	6	27	4
Statement clarify	19	3	44	7	38	6
Prediction of impacts	6	1	69	11	25	4
Significance of impacts	31	5	38	6	31	5
Assessment of alternative options	31	5	44	7	24	4
Mitigation measures	19	5	50	8	31	5
Monitoring	44	7	44	7	13	2
Consultation/participation	60	9	33	5	6	1

1. Percentage of statements received.

2. The number of reviewed statements which ascribed to rating.

Environmental Impact Statement	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Quality of the Terms of Reference	**	*	*	*	*	***	*	*	*	*	***	*	***	*	**	***
2. Scoping and Screening	**	**	***	*	***	***	n/a	*	*	*	**	**	**	**	*	***
3. Statement Clarity	*	**	***	*	***	***	**	**	**	**	**	*	***	***	**	***
4. Prediction of Impacts	**	***	***	**	***	**	**	**	*	**	**	**	***	**	**	**
5. Evaluation of the Significance of Impacts	*	***	***	**	***	**	***	**	*	*	*	*	***	**	**	**
6. Assessment of Alternative Options.	*	**	***	**	**	**	***	**	*	*	*	*	***	***	**	**
7. Mitigation Measures Proposed	**	***	***	*	***	***	**	**	*	**	**	*	***	**	**	**
8. Monitoring and/or Auditing Measures Proposed	*	**	**	*	*	***	*	**	**	*	*	**	**	*	**	***
9. Consultation and/or Participation	**	**	**	*	n/a	*	*	**	*	*	*	*	*	**	*	***

Note: The EISs assessed are listed by number only which do not correspond to the order of statements listed in Annex 4. It is not our intention to make public judgements on individual EIAs.

