



## **ENVIRONMENTAL IMPACT ASSESSMENT: GENERAL PROCEDURES**

**Joshua Were**

Kenya Electricity Generating Company Ltd.  
Regulatory Affairs Division, Environment and CDM Department  
P. O. Box 47936-00100, Nairobi  
KENYA  
*jwere@kengen.co.ke*

### **ABSTRACT**

Environmental Impact Assessment (EIA) can broadly be defined as a systematic process that examines environmental and social consequences of development actions, in advance. The legal, methodological and procedural foundations of EIA were established in 1970 by enactment of the National Environmental Policy Act (NEPA) in the United States of America (USA). At the international level, lending banks and bilateral aid agencies have EIA guidelines that apply to projects financing and recipient countries. Most developing countries have also embraced and formalized EIA process through legislation and policies. This paper highlights the evolution to the current status, legal framework, concepts, processes and principles of EIA and associated studies for proposed developments, including geothermal projects.

## **1. INTRODUCTION**

### **1.1 Origin of EIA**

Before the First World War, rapid industrialization and urbanization in western countries was causing rapid degradation and loss of natural resources. This continued to the period after the Second World War giving rise to concerns for pollution, quality of life and environmental stress. In early 60s, investors realized that the projects they were undertaking were affecting the environment, resources, raw materials and people. As a result of this, pressure groups formed with the aim of getting a tool that could be used to safeguard the environment in any development. The USA government decided to respond to these emerging issues and established a National Environmental Policy Act in 1970 to consider its goal in terms of environmental protection. The USA therefore became the first country to enact legislation on EIA. This was the first time that EIA became the official tool to be used to protect the environment. The United Nations Conference on the Environment in Stockholm in 1972 and subsequent conventions formalized EIA. At present, all developed countries have environmental laws whereas most of the developing countries are still in the process of adopting it (Lee, 1995). Multilateral and bilateral lenders included EIA requirements in their project eligibility criteria (OECD, 1996).

### **1.2 EIA in developing countries**

Until recently, EIA as a new concept was not readily understood and accepted as a tool in developing countries. Developers resisted and argued that it was anti-development because laws and policies

supporting it dictated that developments causing negative impacts should be discontinued. In a nutshell, EIA was considered just another bureaucratic stumbling block in the path of development. Secondly, it was conceived as a sinister means by which industrialized nations intend to keep developing countries from breaking the vicious cycle of poverty.

Thirdly, the experts in the developing countries were foreigners who were viewed as agents of colonization. However, the need for EIA has become increasingly important and is now a statutory requirement in many developing countries.

Historically, the choice of new projects was primarily based on one criterion: economic viability. Today, a second and a third choice criteria, environmental and social impact, have become a strong yardstick, hence the triple bottom-line approach (economic, environmental and social aspects) to project viability (Modak & Biswas, 1999).

## **2. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK RELATING TO EIA**

EIA process takes place within the legal and/or policy and institutional frameworks established by individual countries and international agencies. EIA guidelines and procedure can contribute to successful implementation of projects if these frameworks are adhered to.

### **2.1 EIA in the context of international environmental law**

Key Multilateral Environmental Agreements (MEAs) have influenced review and improvements in EIA legal, policy and institutional arrangements. The key agreements are discussed below.

#### **a) Convention on Environmental Impact Assessment in a Trans-boundary Context (Espoo, 1991)**

This was the first multi-lateral EIA treaty. It looks at EIA in a trans-boundary context and entered into force in 1997. The Espoo Convention set out the obligations of parties to assess the environmental impact of certain activities at an early stage of planning. It also laid down the general obligation of states to notify and consult each other on all major projects under consideration that are likely to have significant adverse environmental impact across borders.

Apart from stipulating responsibility of signatory countries with regard to project proposals that have trans-boundary impacts, it described the principles, provisions, procedures to be followed and list of activities, contents of documentation and criteria of significance that apply.

#### **b) Rio Declaration (1992)**

Principle 17 of Rio Declaration on Environment and Development of 1992, calls for use of EIA as a national decision making instrument for assessing whether proposed activities are likely to have significant adverse impacts on the environment. It also emphasized the role of competent national authority in the decision-making process. Principle 15 of this declaration that is relevant to EIA practice is the application of the 'Precautionary Principle'.

Agenda 21, which was also as a result of this convention, proposed that governments should:

- *“Promote the development of appropriate methodologies for making integrated energy, environment and economic policy decisions for sustainable development, inter alia, through environmental impact assessment (9.12(b))*
- *Develop, improve and apply environmental impacts assessment, to foster sustainable industrial development (9.18)*

- Carry out investment analysis and feasibility studies including environmental assessments for establishing forest based processing enterprises.
- Introduce appropriate EIA procedures for proposed projects likely to have significant impacts upon biological diversity, providing for suitable information to be made widely available and for public participation, where appropriate, and encourage the assessment of impacts of relevant policies and programs on biological diversity (15.5(k)) (UNICED 1992).

Agenda 21 set the framework within which countries could establish their national environmental laws.

- c) **UN Convention on Climate Change and Biological Diversity (1992)** cited EIA as an implementing mechanism of these conventions (article 4 and 14, respectively).
- d) **Doha Ministerial Declaration** encourages countries to share expertise and experience with members wishing to perform environmental reviews at the national level (November, 2001).
- e) **UNECE (Aarhus) Convention** on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters (1998) covers the decisions at the level of projects and plans, programs and policies and by extension, applies to EIA and SEA.
- f) United Nations Conference on the Environment in Stockholm 1972.

## 2.2 Multilateral and bilateral financial institutions environmental and social safeguards

Development Financing Institutions (DFIs) like African Development Bank (AfDB), Asian Development Bank (ADB), European Bank for Reconstruction and Development (EBRD), European Investment Bank (EIB), Japanese Bank for International Cooperation (JBIC), AfD of France, KfW of Germany, World Bank (WB) have environmental and social safeguards to ensure that financing of projects is not only based on the precautionary principle, preventative action rather than curative treatment but sustainable development (WBCSD, 2005). Although their operational policies and requirements vary in certain aspects, the DFIs follow a relatively standard procedure for the preparation and approval of an EIA study report. Loan recipient countries are responsible for the preparation of the EIA report, and this requirement possibly more than any other has influenced the introduction and development of the EIA process in many developing countries. The EIA study should examine project alternatives and identify ways of improving project selection, siting, planning, design and implementation by preventing, minimizing, mitigating and compensating for adverse environmental impacts.

Just like other banks, the World Bank has a criteria for screening projects as follows:

**Category A:** If the project is likely to have significant environmental impacts that are sensitive, diverse or unprecedented. These impacts may affect an area broader than the communities benefiting from infrastructure investments.

**Category B:** If the projects' potential adverse environmental impacts on human populations or environmentally important areas are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects.

**Category C:** If the project is likely to have minimal or no adverse environmental impacts. Once the project is assessed and determined as Category C, no further action would be required. Some examples of Category C projects include: Education (i.e. capacity-building, etc., not including school construction), Family planning (World Bank 1999) etc.

All projects financed by the DFIs should also comply with the requirements of relevant multilateral environmental agreements (MEA) to which the host country is a party, including the Montreal Protocol on Ozone Depleting Substances (ODA), the UN Framework Convention on Climate Change

(UNFCCC) and the Kyoto Protocol on Greenhouse Gas (GHG) emissions and the Aarhus Convention on Environmental Information disclosure.

All international organizations and bilateral agencies frequently update their procedures and it is important to obtain the current versions from the organization.

### **2.3 National legislations relating to EIA**

National legislations may include a statutory requirement for an EIA to be done in a prescribed manner for specific development activities. Most legislations list projects for which EIA is mandatory. The statutory requirement to carry out an EIA for specific projects will, for example, require registered EIA/ Audit experts to carry out the study, a designated national authority with the help of lead agencies and technical committees to review the EIA reports and approve the proposed projects.

Other national legal requirements that govern utilization and protection of natural resources like water, fisheries, forests, wildlife, public health, etc, must be identified and complied with during an EIA study process.

### **2.4 Institutional framework**

Institutional systems relating to EIA vary from country-to-country reflecting different types of environmental governance. In some countries, either the Ministry of Environment or a designated National Authority or Planning Agency, administers EIA.

Environmental issues also involve many disciplines and many government bodies with general environmental and resource management laws. Data will therefore, have to be collected and collated from a wide range of technical ministries, other government authorities and parastatals, where applicable.

## **3. PREPARATION OF EIA TERMS OF REFERENCE (TOR)**

Terms of Reference (TOR) for EIA sets out what is expected of a practitioner or a consultant when carrying out an EIA. TOR can be simple or elaborate but extremely elaborate TOR is usually not recommended. There are no universal formats for Terms of Reference, which will be suitable for every study. However, there are general rules, which should be observed when preparing ToR for the EIA.

- The TOR should commence with a brief description of the project. This should include a map of the area that will be affected either indirectly or directly.
- The TOR indicate the major issues that the consultants or practitioners should focus on, particularly the most serious likely impacts identified during scoping e.g. air emission, waste water discharge etc. The opportunities for enhancing any positive benefits from the project should also be highlighted. This component of TOR is usually submitted to designated authority for scrutiny and approval.
- The TOR should contain explicit references to which safeguard policies may be relevant and which legal requirements should be applied.
- The TOR should give an indication of the team considered necessary for the study and a team leader identified. Depending on the scope of the study this may be multi-disciplinary. However, the team composition should not be rigidly imposed on the consultant.
- If international experts are doing the EIA, it is important to make provisions for local capacity building in the TOR. Apart from enabling in-country expertise to be developed, this will promote more involvement and understanding of the issues raised by the study. As most EIA studies are of relatively short duration, this is probably best achieved through the attachment of project

proponent staff to the consultants during the study or an insistence on the use of local personnel for some of the tasks.

- The expected date of commencement and time limit should be given and consultants program of work must be within the given time limit.
- The budget limit should be given in the TOR. The type of experts, and whether foreign or local, and the duration of their inputs will usually be the deciding cost factors although a large field survey or measurement or modeling program with laboratory analysis could significantly increase costs. Any assistance to be provided by the Client to reduce costs should be clearly stated in the TOR.
- Consultant payments proposal should be made and tied to specific milestones e.g. the consultant will be paid 20% of their fee upon receipt of draft report by client etc.
- Reporting requirements should be clearly stated and should comply with local or international reporting guidelines. The format of EIS must be clear and the number of copies in soft and hard must be stated.
- The TOR should make provision for the consultants to improve the Terms of Reference in order to improve the quality of EIA report.

#### **4. ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

The first phase of an Environmental Impact Assessment (EIA) is called an Initial Environmental Examination (IEE) and the second is Environmental Impact Studies (EIS) or simply detailed EIA.

##### **a) Initial Environmental Examination**

The IEE is carried out to determine whether potentially adverse environmental effects are significant or whether mitigation measures can be adopted to reduce or eliminate these adverse effects. The IEE contains a brief statement of key environmental issues, based on readily available information, and is used in the early (pre-feasibility) phase of project planning. The IEE also suggests whether in-depth studies are needed. When an IEE is able to provide a definite solution to environmental problems, an EIA is not necessary. IEE also requires expert advice and technical input from environmental specialists so that potential environmental problems can be clearly defined.

##### **b) Environmental Impact Assessment**

EIA is a process used to systematically examine the potential environmental consequences or impacts, both beneficial and adverse, of a proposed development project and to ensure that these effects are taken into account in the project design phase. The EIA is therefore based on predictions. These impacts can include all relevant aspects of the natural, social, economic and human environment. The study therefore requires a multi-disciplinary approach and should be done very early at the feasibility stage of a project. In other words, a project should be assessed for its environmental and social viability.

EIA should therefore be viewed as an integral part of the project planning process. Unlike the environmental audit (EA), which is conducted on on-going and existing operating projects, the EIA is applied to new projects and the expansion aspects of existing projects. The phases of an EIA from screening to follow-ups are illustrated in Figure 1 below:

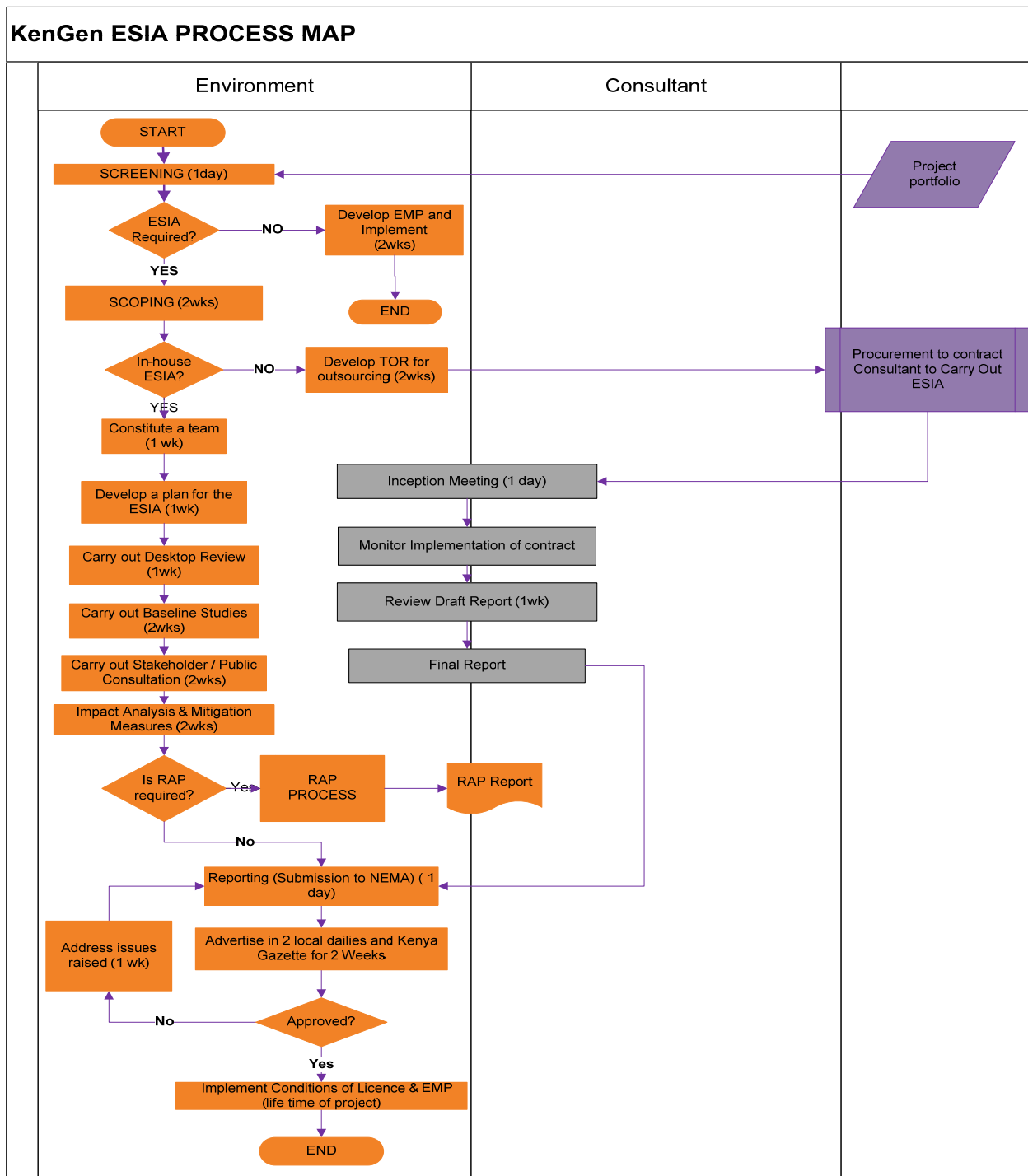


FIGURE 1: Generalized EIA and RAP Process Flow-Chart (KenGen Process Maps, 2011)

### 4.1 Screening

The EIA process kicks off with project screening. Screening is done to determine whether or not a project proposal should be subject to EIA and, if so, at what level of detail. A guideline for whether or not an EIA is required is country specific depending on the laws or norms in operation. Legislation often specifies the criteria for screening and full EIA. Development banks also screen projects presented for financing to decide whether an EIA is required using their set criteria.

The output of the screening process is often a document called an **Initial Environmental Examination or Evaluation** (IEE) (See Section 4.1). The main conclusion will be a classification of the project according to its likely environmental sensitivity. This will determine whether an EIA is needed and if so, to what detail.

## 4.2 Scoping

The aim of EIA is not to carry out exhaustive studies on all environmental impacts for all projects. Scoping is used to identify the key issues of concern at an early stage in the planning process (Ahmed & Sammy, 1987). The results of scoping will determine the scope, depth and terms of reference to be addressed within the Environmental Statement. Scoping is done to:

- Identify concerns and issues for consideration in an EIA
- Ensure a relevant EIA
- Enable those responsible for an EIA study to properly brief the study team on the alternatives and on impacts to be considered at different levels of analysis
- Determine the assessment methods to be used
- Identify all affected and interested parties
- Provide an opportunity for public involvement in determining the factors to be assessed, and facilitate early agreement on contentious issues
- Save time and money
- Establish Terms of Reference for EIA study

Scoping should be an ongoing exercise throughout the course of the project. The following environmental tools can be used in the scoping exercise

**Checklists** – These are standard lists of the types of impacts associated with a particular type of project. Checklist methods are primarily for organizing information or ensuring that no potential impact is overlooked. They comprise list of questions on features of the project and environmental impacts. They are generic in nature and are used as aids in assessment.

**Matrices** – The matrix methods identify interactions between various project activities and environmental components. They incorporate a list of project activities with a checklist of environmental components that might be affected by these activities. A matrix of potential interactions is produced by combining these two lists (placing one on the vertical axis and the other on the horizontal axis). They should preferably cover both the construction and the operation phases of the project, because sometimes, the former causes greater impacts than the later. However, matrices also have their disadvantages: they do not explicitly represent spatial or temporal considerations, and they do not adequately address synergistic impacts.

**Networks** – These are cause-effect flow diagrams used to help in tracing the web relationships that exist between different activities associated with an action and environmental system with which they interact. They are also important in identifying direct and cumulative impacts. They are more complex and need expertise for their effective use.

**Consultations** with decision-makers, directly affected communities, environmental and other interest groups to ensure that all potential impacts are detected. However, there can be danger in this when excessive consultation is done and some unjustifiable impacts included in the ToR.

## 4.3 Baseline data collection

The term "baseline" refers to the background information on the biophysical, social and economic settings of the proposed project area. Normally, information is obtained from secondary sources, or the

acquisition of new information through field samplings, interviews, surveys and consultations with the public. The task of collecting baseline data starts right from the period of project inception. However, a majority of this task may be undertaken during scoping and actual EIA.

Baseline data is collected for two main purposes

- To provide a description of the current status and trends of environmental factors (e.g., air pollutant concentrations) of the project area against which predicted changes can be compared and evaluated in terms of significance, and
- To provide a means of detecting actual change by monitoring once a project has been initiated

Only baseline data needed to assist prediction of the impacts contained in the TOR and scoping report should be collected.

#### 4.4 Impact analysis and prediction

Predicting the magnitude of a development likely impacts and evaluating their significance is the core of environmental assessment process (Morris & Therivel, 1995). Prediction should be based on the available environmental baseline data of the project area. Such predictions are described in quantitative or qualitative terms.

##### 4.4.1 Considerations in impact predictions

**Magnitude of impact:** This is defined by the severity of each potential impact and indicates whether the impact is irreversible or, reversible and estimated potential rate of recovery. The magnitude of an impact cannot be considered high if a major adverse impact can be mitigated.

**Spatial extent of impact:** The spatial extent or the zone of influence of the impact should always be determined. An impact can be site-specific or limited to the project area; a locally occurring impact within the locality of the proposed project; a regional impact that may extend beyond the local area and a national impact affecting resources on a national scale and sometimes trans-boundary impacts, which might be international.

**Duration of impact:** Environmental impacts have a temporal dimension and needs to be considered in an EIA. Impacts arising at different phases of the project cycle may need to be considered. An impact that generally lasts for only three to nine years after project completion may be classified as short-term. An impact, which continues for 10 to 20 years, may be defined as medium-term, and impacts that last beyond 20 years are considered as long-term.

**Significance of the impact:** This refers to the value or amount of the impact. Once an impact has been predicted, its significance must be evaluated using an appropriate choice of criteria. The most important forms of criterion are:

- Specific legal requirements e.g. national laws, standards, international agreements and conventions, relevant policies etc.
- Public views and complaints
- Threat to sensitive ecosystems and resources e.g. can lead to extinction of species and depletion of resources, which can result, into conflicts.
- Geographical extent of the impact e.g. has trans-boundary implications.
- Cost of mitigation
- Duration (time period over which they will occur)
- Likelihood or probability of occurrence (very likely, unlikely, etc.)
- Reversibility of impact (natural recovery or aided by human intervention)
- Number (and characteristics) of people likely to be affected and their locations



- Cumulative impacts e.g. adding more impacts to existing ones.
- Uncertainty in prediction due to lack of accurate data or complex systems. Precautionary principle is advocated in this scenario.

#### 4.4.2 Impact prediction methodologies

Several techniques can be used in predicting the impacts. The choices should be appropriate to the circumstances. These can be based on:

- Professional judgment with adequate reasoning and supporting data. This technique requires high professional experience.
- Experiments or tests. These can be expensive.
- Past experience
- Numerical calculations & mathematical models. These can require a lot of data and competency in mathematical modelling without which hidden errors can arise
- Physical or visual analysis. Detailed description is needed to present the impact.
- Geographical Information Systems
- Environmental Risk Assessment, and
- Economic Valuation of environmental impacts

#### 4.5 Analysis of alternatives

Analysis of project alternatives is done to establish the preferred or most environmentally sound, financially feasible and benign option for achieving project objectives.

The World Bank directives requires systematic comparison of proposed investment design in terms of site, technology, processes etc., in terms of their impacts and mitigation options, capital or recurrent costs, suitability under local conditions and institutional, training and monitoring requirements (World Bank, 1999). For each alternative, the environmental cost should be quantified to the extent possible and economic values attached where feasible, and the basis for the selected alternative stated. The analysis of alternative should include a “**NO PROJECT**” alternative.

#### 4.6 Mitigations and impacts management

Mitigation is done to avoid, minimize or offset predicted adverse impacts and, where appropriate, to incorporate these into an Environmental Management Plan or System. For each potential adverse impact the plan for its mitigation at each stage of the project should be documented and costed, as this is very important in the selection of the preferred alternative.

The objectives of mitigation therefore are to:

- find better alternatives and ways of doing things;
- enhance the environmental and social benefits of a project
- avoid, minimise or remedy adverse impacts; and
- ensure that residual adverse impacts are kept within acceptable levels

TABLE 1: Design of Mitigation Measures

<u>Approach</u>	<u>Examples</u>
Avoid	Change of route or site details, to avoid important ecological or archaeological features
Replace	Regenerate similar habitat of equivalent ecological value in different location.
Reduce	Filters, precipitators, noise barriers, dust enclosures, visual screening, wildlife corridors, and changed time of activities
Restore	Site restoration after construction
Compensate	Resettlement of Project Affected Persons (PAPs) or communities, facilities for the affected communities, financial compensation for the affected individuals etc.

#### 4.7 Environmental management plan and monitoring programs

##### 4.7.1 Environmental management plan

An Environmental Management Plan (EMP) is a detailed plan and/or schedule of measures necessary to minimize, mitigate, etc. any potential environmental impacts identified by the EIA (World Bank 1999). Once the EIA has been done and the significant impacts identified, it is necessary to prepare an EMP.

An EMP should consist of a set of mitigation, monitoring and institutional measures to be taken during the implementation and operation of the proposed project to eliminate adverse environmental impacts, offset them or reduce them to acceptable levels. The EMP should also include the actions needed to implement these measures, including the following features:

- Mitigation based on the environmental impacts reported in the EIA,
- The EMP should describe with technical details each mitigation measure.
- The EMP should then include monitoring objectives that specifies the type of monitoring activities that will be linked to the mitigation measures. Specifically, the monitoring section of the EMP provides:
  - A specific description and technical details of monitoring measures that includes the parameters to be measured, the methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions;
  - Monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and to furnish information on the progress and results of mitigation.
- The EMP should also provide a specific description of institutional arrangements i.e. who is responsible for carrying out the mitigating and monitoring measures (for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training).
- The EMP in addition, should include an estimate of the costs of the measures and activities recommended.
- It should consider compensatory measures if mitigation measures are not feasible or cost effectiveness.
- The EMP must be operative throughout the whole Project Cycle.

##### 4.7.2 Monitoring programs

The monitoring program (MPs) is the systematic measurement of key environmental indicators over time within a particular geographic area (World Bank, 1999). Monitoring should focus on the most significant impacts identified in the EIA. Various types of monitoring activity are currently in practice. The main types are briefly described below:

**Baseline monitoring:** A survey should be conducted on basic environmental parameters in the area surrounding the proposed project before construction begins. Subsequent monitoring can assess the changes in those parameters over time against the baseline.

**Impact monitoring:** The biophysical and socio-economical (including public health) parameters within the project area, must be measured during the project construction and operational phases in order to detect environmental changes, which may have occurred as a result of project implementation e.g. air emission, dust, noise, water pollution etc. (European Commission, 1999).

**Compliance monitoring:** This form of monitoring employs a periodic sampling method, or continuous recording of specific environmental quality indicators or pollution levels to ensure project compliance with recommended environmental protection standards.

Monitoring should be regular and performed over a long period of time. Interruptions in monitoring may result in generating insufficient data for analysis and trending to draw accurate conclusion concerning project impact.

The main aim of EIA monitoring is to provide the information required to ensure that project implementation has the least possible negative environmental impacts on the people and environment.

What to avoid in monitoring:

- Overestimation of data needed as this can lead to drowning in data without information.
- Under-estimation of time and cost for data analysis
- Weak coordination between the data collection with project time table and seasonal factors
- Ignoring requirements for baselines

#### 4.8 Environmental impact statement

The final EIA study report is referred to as an Environmental Impact Statement (EIS). Most national environmental laws have specified what the content of EIS should have. Multilateral and bilateral financial institutions have also defined what should be contained in an EIS. Ideally, the content of an EIS should have the following:

- Executive summary
- Policy, legal and administrative framework
- Description of the environment
- Description of the proposed project in detail
- Significant environmental impacts
- Socio-economic analysis of project impacts
- Identification and analysis of alternatives
- Mitigation action/mitigation management plan
- Environmental management plan
- Monitoring program
- Knowledge gaps
- Public involvement
- List of references
- Appendices including
  - Reference documents, photographs, unpublished data
  - Terms of reference
  - Consulting team composition
  - Notes of public consultation sessions

#### **4.9 Decision making**

At each stage of EIA, interim decisions are made. These decisions influence final decisions made about the EIA.

The EIS is submitted to designate national authority for review before the final decision. The authority, together with technical review panels determines the quality of EIS and gives the public further opportunity to comment. Based on the outcome of the review, the designated authority or lending institution will accept, reject or make further modifications to avoid future confrontation. If the EIS is accepted, an EIA license is issued and if otherwise, additional studies or recommendations are made before issuance of a license. The decision making process should be autonomous so that the outcome of the review is seen as fair enough. The duration of this process is usually set out in the EIA legal framework.

#### **4.10 Effective EIA follow-up**

In practice, an EMP, which is submitted with the EIS report, should be used during implementation and operation of the project. The link between EIA process and project implementation stage is often weak especially in developing countries (Welford, 1996). Despite this, they may still be no more good than intentions unless an independent check is made to ensure that the developer is acting as intended.

These weaknesses could be attributed to:

- Deficiencies in EMPs prepared during the EIA.
- Deficiencies in monitoring and enforcing compliance through use of legal instruments and financial penalties (most EIAs end after environmental clearance has been received from the environmental management authority).
- Timing of some projects especially in developing countries are implemented several years after the EIA and the EMP. In such scenarios, an update of the EIA should be done and a new EMP developed.

ISO 14001:2004 and other Environmental Management Systems (EMS) can provide the link between the EIA and environmental management requirements after the EIA (during project implementation, operation and decommissioning).

### **5. PUBLIC CONSULTATION AND PARTICIPATION PROCESS**

#### **5.1 Public consultation and participation process from a legal perspective**

There is an upsurge in attention paid to Public Consultation and Participation (PC&P) process in recent years with increase in environmental awareness levels. Most international and national environmental legislations are now making specific and detailed provisions for public participation and disclosures. Multilateral financial agencies like the World Bank and bi-lateral aid agencies show parallel interest in ensuring that the public is involved in the EIA process (Mutemba, 1999).

These provisions usually guarantee enforcement of utility commitments to public involvement in environmental decision-making. For example the Kenyan Constitution of 2010, recognizes individual's right to a clean and healthy environment. To this end, the environmental management and coordination act provides administrative mechanism for addressing public consultations and grievances.

#### **5.2 Designing public consultation and participation program**

There is no one-size-fits-all approach to public participation (U.S. Department of Commerce, 1994).

There are, however, certain issues that arise in designing any highly effective public participation program. The PC&P planning team should:

- Have a clearly defined expectation for what the team hopes to accomplish with the public.
- Do stakeholder identification and mapping based on their interests and influences.
- Target those segments of the public (stakeholders) most likely to see themselves as impacted by the decision
- Be well integrated into the decision-making process
- Involve interested stakeholders in every step of decision-making, not just the final stage
- Provide alternative levels of participation based upon the public's level of interest and reflecting the diversity of those participating
- Provide genuine opportunities to influence the decision
- Take into account the participation of internal stakeholders as well as external stakeholders

Adequate consultation takes time and resources and cost money especially if the project is being implemented in remote locations with biological and cultural diversity. The EIA team must therefore make adequate budget provisions to meet these costs. Sufficient time must also be allocated within the EIA time frame.

Since stakeholder involvement requires additional expenditure, it is important to find the most cost effective way of integrating stakeholder involvement in the project life cycle. This is also necessary because it will avoid creating "stakeholder fatigue" and incurring unnecessary expenditure. The Table 2 below shows how and when the stakeholders should be involved.

TABLE 2: Public Participation in Project Cycle

<b>Project cycle</b>	<b>EIA component</b>	<b>Public participation activity</b>
<b>Pre-feasibility</b>	Environmental Screening	Identifies public groups and begins initial contact with groups.
	Initial Environmental Examination (IEE)	Continue consultations – public provides input to IEE report.
	Scoping	Identifies major issues for Scoping and TOR using public input and makes plan for public involvement.
<b>Feasibility</b>	Environmental Impact Assessment (EIA)	The public reviews and comments on draft EIA study report. The public provides input to design and survey.
<b>Detailed survey and design</b>	Integration of Environmental Mitigation Measures	Detailed design made available to the public.
<b>Construction and operation</b>	Environmental Monitoring	The public provides input to post-evaluation of impacts and mitigation measures.

### **5.3 Public participation techniques**

There are techniques for getting information to the public (one-way e.g. press releases, newsletters, etc.), getting it from the public (one-way e.g. polls, surveys, questionnaires) and exchanging information (interaction between the proponent and the public e.g. public hearings, workshops, meetings, advisory groups/ task forces, etc.). When selecting a technique, it is always wise to build on existing communication channels that are familiar with the community or stakeholders involved. There is no public participation technique that will work in all circumstances. When people talk about highly successful public participation programs they are talking about programs where the techniques matched the purpose of the program, reached the interested stakeholders, and resulted in a clear linkage between the public participation process and the decision-making process.

It is worth noting that “making a decision” in public participation is not a single moment in time, but an accumulation of many smaller decisions. There are decisions being made at every step in the consultation process regardless of the technique.

### **5.4 Monitoring and evaluation of public consultation and participation**

Most EIA projects usually have no monitoring systems for PC&P built into their structure. Monitoring and Evaluation (M&E) assess the quality of public consultations in the EIA process. Techniques for monitoring and evaluating PC&Ps include confirmation that participants understood the consultation content (correct language, level of technicality), and assessment of stakeholders’ opinions of PC&P effectiveness and impact on project design and implementation. Through appropriate use of M&E, public consultation strategies can be adjusted during the project cycle to improve stakeholder participation, information dissemination strategies, and mechanisms for integrating participant feedback into project design and implementation.

## **6. EIA RELATED STUDIES**

### **6.1 Social impact assessment**

Social Impact Assessment (SIA) includes the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions and any social change processes invoked by those interventions (Vanclay, 1999). The analysis should include the use of land, culture, the main economic activities e.g. tourism, agriculture, employment levels and impact on service provision e.g. education, water use, traffic, energy use etc. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment. SIA assumes that social, economic and biophysical impacts are interconnected and is therefore done to ensure that there is no mismatch between the development and socio-cultural and economic aspects of the project area.

### **6.2 Health impact assessment**

Health is a state of complete physical, mental and social well-being and not merely absence of disease or infirmity (WHO, 1946).

In most EIAs, Health Impact Assessment (HIA) is usually included under SIA. HIA is now emerging as a key component of EIA because health is determined by a multiplicity of factors including socio-economic and environmental factors. There is no clear definition about where health concerns end and where environmental or social concerns begin. HIA is a broad concept that may be interpreted in different ways by a range of different users but all imply an interest in the safeguarding and enhancement of human health and a concern that human activities and decisions, in the form of

development projects, plans, programs and policies can affect human health in both positive and negative ways.

### 6.3 Strategic environmental and social assessment

Strategic Environmental and Social Assessment (SEA) is undertaken much earlier in the decision-making process than EIA. It is therefore seen as a key tool for sustainable development. SEA aims to incorporate environmental sustainability considerations into strategic decision making processes, such as the formulation of policies, plans and programs.'

## 7. EIA GUIDING PRINCIPLES

International Association for Impact Assessment (IAIA, 1999) and others have developed guiding principles for EIA and/ or Impact Assessment (IA). The principles listed below are a selection of some of the documented ones.

**Participative:** The process should provide appropriate opportunities to inform and involve the affected and interested stakeholders and incorporate their input in decision-making.

**Transparency:** Assessment process, outcomes and decisions should be open and accessible.

**Certainty:** The EIA process and timing should be agreed in advance and followed by all participants.

**Accountability:** The decision-makers and project proponents are responsible to all parties for their action and decisions under the assessment process.

**Credibility:** Assessment is undertaken with professionalism and objectivity.

**Cost-effectiveness:** The assessment process and its outcomes will ensure environmental protection at the least cost option to the society.

**Practical:** The process should result in practical outputs, which can be implemented by the project proponent.

**Relevant:** The process should focus on information that is relevant for development planning and decision-making.

**Focused:** The process should concentrate on significant environmental effects and key issues that need to be taken into account in making decisions.

**Interdisciplinary:** The process should ensure that the appropriate techniques and experts in the relevant disciplines are employed, including use of traditional knowledge, as relevant.

**Integrated:** The process should address the interrelationships of social, economic and biophysical aspects.

## 8. CONCLUSIONS

EIA certainly has a crucial role to play in addressing environmental and social issues surrounding projects development planning and especially geothermal projects. The integration of environment into development planning is the most important tool in achieving sustainable development. Environmental protection and economic development must thus be dealt with in an integrated manner. EIA process is necessary in providing an anticipatory and preventive mechanism for environmental management and protection in any development. Several developing countries are still at the infancy stage of operationalization of their EIA processes. The need for capacity building for quality EIA is also eminent in these countries. Despite these small setbacks, environmental impact assessment has become an integral part of project planning one, which is continually being improved for posterity.

**REFERENCES**

- Ahmad Y. J. and Sammy G. K., 1987: *Guidelines to Environmental Impact Assessment in developing countries*. UNEP Regional Seas Reports and Studies No. 85, UNEP, 1987.
- European Commission, 1999: *Guidelines for the assessment of indirect and cumulative impacts as well as impact interactions*. Luxembourg, 172 pp.
- International Association for Impact Assessment, 1999: *Principles of Environmental Impact Assessment best practice*. UK, 20 pp
- Lee N., 1995: *Environmental Assessment in European Union: a 10<sup>th</sup> anniversary project appraisal 7*. 123-136.
- Modak P. & Biswas A. K., 1999: *Conducting Environmental Impact Assessment for developing countries*. United Nations University press.
- Morris P and Therivel R. (eds), 1995: *Methods of environmental impact assessment*. UCL press, London.
- Mutemba S., 1996: Public participation in environmental assessment for banks supported projects in sub-Saharan Africa. In: *Environmental assessment in Africa: A World Bank commitment*. Environmental Department, World Bank, Washington, DC.
- Organization for Economic Cooperation and Development, 1996: *Coherence in environmental assessment: practical guidance on development cooperation projects*. OECD, Paris.
- U.S. Department of Commerce, 1994: *Guidelines and principles for Social Impact Assessment*. The Inter-organizational Committee on Guidelines and Principles for Social Impact Assessment.
- UNICED 1992: *UNICED Report A/CONF. 151/5/Rev 1*.
- Vanclay F., 1999: *Social Impact Assessment*. In: Petts, J (ed.), *International handbook of Environmental Impact Assessment*. Blackwell Science.
- Welford R., 1996: *Corporate environmental management*. Earthscan, London.
- World Bank 1999: *Good practices: Environmental Assessment*. Operational manual, GP 4.01, and Environment Department World Bank, Washington, DC.
- World Bank 1999: *Operational policy OP 4.01 Annex C: Environmental Management Plan*, World Bank Washington, DC.
- World Business Council for Sustainable Development, 2005: *Environmental and Social Impact Assessment (ESIA) guidelines*. 54 pp.
- World Health Organization 1946: *History of WHO*. WHO, webpage: <http://www.who.int/topics/en>