**Department**: Geography and Environmental Studies (Undergraduate Program)

**Course Title**: Environmental Impact Assessment **Course code**: GeES3122

**Year of Study**: III **Semester**: II

 **Faculty Social Science**

 **Department of Geography and Environmental Studies**

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| Degree Program | **B. A Degree in Geography and Environmental Studies** |
| Module Name | Environmental Studies |
| Module Coordinator | **---------------------------** |
| Course Title | Environmental Impact Assessment |
| Course category  | Core  |
| Course Code | GeES 3122 |
| Course information | Academic Year 2011EC Semester II |
| Instructor Name | Fitsum D. |
| Instructor’s Contact  | Contact information: Email: fitsumdechu@gmail.com  |
| Weight in ECTS | 5cp x27= 135 hrs |
| Student Work Load | Lectures | Tutorial | Group Work/Discussion and Presentation | Field TripReport | Home Study | Total |
| 40 hrs | 15 hrs | 25 hrs | 10 hrs | 45hrs | 135 hrs |
| Course description | This course is designed to introduce students of geography and environmental studies and other development related programs with the interaction between environment and development activities, the issue of sustainable development, the way how to make development sustainable, the concept of environmental impact assessment, its purpose, benefit and procedures in undertaking EIA.The course requires integration of theories & examples with the practical situation of our country. It requires students to relate all the discussions in the classroom and the literature with the real cases in our country.  |
| Course Objectives  | At the end of the course, the student will be able to:* Understand the concept- EIA and sustainability;
* Understand and analyze the interdependence between sustainable development and environmental impact assessment;
* Explain the procedures involved in environmental impact assessment;
* Justify the importance of sustainable development;
* Appreciate the importance of Environmental Impact Assessment;
* Develop skills of local problem identification
 |
| Mode of delivery | Block |
| Target Groups | 3rd Year Geography and Environmental Studies Students |
| Year/Semester | Year III, Semester II |
| Course status | Compulsory |
| Pre-requisites | None |

**Course contents**

|  |
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|  **Schedule** |
| **Week**1 | **Topics and Sub-topics to be covered** |
|  **UNIT ONE: INTRODUCTION TO EIA*** 1. Meaning and Scope of EIA
	2. Nature and Scope of Environmental Issues and Impacts
	3. Core Values and Guiding Principles of EIA
	4. Key Elements of the EIA Process
	5. Costs and Benefits of
 |
| 2 | **UNIT TWO: PUBLIC INVOLVEMENT** * 1. Introduction: What is Public Involvement?
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	3. Principles of Public Involvement
	4. Scope of public Involvement
 |
| 3 |  **UNIT THREE: SCRRNING*** 1. Screening Procedure
	2. Project List for Screening
	3. Preliminary EIA
	4. Criteria for the Determination of the Need for and the Level of EIA
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| 45  6   77  |  **UNIT FOUR: SCOPING*** 1. Introduction: Meaning and Purpose of Scoping
	2. Approaches to Scoping
	3. Scoping Methods
	4. Alternatives to be Considered
	5. EIA Terms of Reference (ToR)
 |
| **UNIT FIVE: IMPACTS ANALYSIS** * 1. Introduction
	2. Impact Identification
	3. Impact Analysis/Prediction
	4. Characteristics of Environmental Impacts
	5. Social Impacts Assessment
	6. Evaluation of Impact Significance
 |
| **UNIT SIX**: **MITIGATION & IMPACT MANAGEMENT*** 1. Link between EIA Process and Mitigation
	2. Elements of Mitigation
	3. Approaches to Mitigation
	4. Environmental Management Plan & Mitigation Measures
 |
|  **UNIT SEVEN**:  **EIA REPORTING** * 1. What is an EIA Report?
	2. Typical Elements of an EIA Report
 |
| **UNIT EIGHT: EIA REVIEW** * 1. Purpose of EIA Review
	2. Main Steps in EIA Review
	3. Undertaking Review
 |
| 8 | **UNIT NINE: DECISION MAKING*** 1. Role and Responsibilities of Decision Makers
	2. EIA as Part of Decision Making Process
 |
| **t-Learning Methods:** | Self-reading, Lecture (conditional)  |
| **Assessment** | **Continuous assessment**  | **Competences to be assessed** |
|  | To be determined  |  |
| **Course Expectation** | **Preparedness:*** Students are expected to attend at least 95% of the total allotted time for the lecture, discussion and presentation sessions.
* To make the teaching-learning process active, students should read the parts to be lectured ahead of time. Complete the reading assignments and other activities on time.

**Participation:** Students are expected to participate in in-class activities.* Make active participation during discussions (you must participate in class). You are not participating if you are talking to a neighbour, doing homework, daydreaming, or not doing what the rest of the class is doing. If you are working in a group or with a partner, you must talk to your group members or partner and be a part of the group. Always be ready and willing to give constructive feedback to partners/group members and reflect the idea of your group members voluntarily.
* In general, the primary requirement of this course is that you play an active role in your own education. This means doing the assigned readings in advance of lecture, paying attention and actively participating in class, preparing for discussions, etc.
 |
| **Course Policy** | **Attendance**: Students are expected to master the material and to attend all classes (if any). Therefore it is compulsory come to class on time and every time during lecture and tutorial classes. If you are going to miss more than three classes during the term, you should not take this course.**Assignments**: Assignments should be attended to at the proper times. Therefore you must do your assignment on time. No late assignment will be accepted. **Tests/**: you will have short tests at least four times. **If you miss the tests** **no make-up** tests will be given.**Cheating**: You must do your own work and not copy and get answers from someone else. The only way to learn to this course is to develop your own concepts, ideas and realize with the real world. Also, please make your mobile silent, before class and exam sessions**.****Responsibilities**: You are responsible for all class announcements and changes. All issues discussed in class or derived from other sources (where I provided you to read) may be the subject of assignment, tests or final exam question items. You have to read the reference materials that are indicated in the course guide book. You are also expected to present in class on topics that you will be provided (if any).* Cell Phones: Cell phones must be turned off before entering the class as they are disruptive and annoying to all of us in the class. So, make sure your cell phone is turned off before entering the class.

**Grading system:**The grading system to be used in rating the students’ performance will be decided depending on the new legislation of the university. |

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| --- | --- | --- |
| Instructors Name: Fitsum D.  | 29/04/2020 GC |  |
| Module team leader:  | 29/04/2020 GC. |  |
| Department head: Dr. Mehrete Belay  | 29/04/2020 GC. |  |

**UNIT 1 – Introduction to EIA**

* 1. **Meaning and Aims of EIA**

Simply defined, **EIA is a systematic process to identify, predict and evaluate the environmental effects of proposed actions and projects**. This process is applied prior to major decisions and commitments being made. Whenever appropriate, social, cultural and health effects are considered as an integral part of EIA. Particular attention is given in EIA practice to preventing, mitigating and offsetting the significant adverse effects of proposed undertakings.

The purpose of EIA is:

* To provide information for decision-making on the environmental consequences of proposed actions; and
* To promote environmentally sound and sustainable development through the identification of appropriate enhancement and mitigation measures.

Sustainable development is a key concept that has gained increasing international acceptance during the last two decades. A landmark in this process was the Brundtland report, which defined sustainable development as development that meets the needs of today generation without compromising those of future generations. Five years later, the UN Conference on Environment and Development (UNCED), the Earth Summit, established a number of international agreements, declarations and commitments (see table below). Agenda 21, the global action plan for sustainable development, emphasizes the importance of integrated environment and development decision-making and promotes the use of EIA and other policy instruments for this purpose.

| **Four cornerstones of the Earth Summit** |
| --- |
| **Cornerstone**  | **Summary**  |
| **The Rio Declaration on Environment and Development**  | A set of principles which provide guidance on achieving sustainable development.  |
| **Framework Convention on Climate Change**  | An international treaty to stabilize greenhouse gas concentrations in the atmosphere.  |
| **Convention on Biological Diversity**  | An international convention with three objectives: the conservation of biodiversity, the sustainable use of its components, and the equitable sharing of benefits from genetic resources.  |
| **Agenda 21**  | A global program of action for achieving sustainable development to which countries are politically committed rather than legally obligated.  |

Sustainable development is an evolving concept, which is continually being redefined and reinterpreted. The starting point for most people is the Brundtland definition (described above), which also can be formally stated as twin principles of **intra- and inter-generational equity**. In practice, these principles mean improving the welfare of the world poor and maintaining the development opportunities for the generations that follow.

The challenge of sustainable development may be summarized by comparing three overriding indicators:

* First, human activity is estimated to currently consume 40 per cent of net primary productivity on land.
* Second, 60 per cent of the world population lives close to or under the poverty line.
* Third, the world population is projected to double by mid-century.

Without major policy and technology changes, United Nations Environment Program (UNEP) and other institutions have concluded that such trends threaten the stability of the world community and the global environment.

**Why EIA is important**?

Reducing the burden of environmental impacts is necessary if development is to become sustainable. These impacts are more complex, larger in scale and further reaching in their potential consequences than three or four decades ago when EIA was first introduced. As a result, EIA has become of ever increasing importance as a tool for development decision-making.

This role is formally recognized **in Principle 17 of the Rio Declaration on Environment and Development**:

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.

In practice, EIA is applied primarily to prevent or minimize the adverse effects of major development proposals, such as power stations, dams and reservoirs, industrial complexes, etc. It is also used as a planning tool to promote sustainable development by integrating environmental considerations into a wide range of proposed actions. Most notably, strategic environmental assessment (SEA) of policies and plans focuses on the highest levels of decision making, when better account can be taken of the environment in considering development alternatives and options. More limited forms of EIA can be used to ensure that smaller scale projects, conform to appropriate environmental standards or site and design criteria. Such projects include road realignment and upgrading, and housing subdivisions.

**What are the Aims and Objectives of EIA?**

The aims and objectives of EIA can be divided into two categories. The **immediate aim** of EIA is to inform the process of decision-making **by identifying the potentially significant environmental effects and risks of development proposals**. The **ultimate (long term) aim** of EIA is **to promote sustainable development** by ensuring that development proposals do not undermine critical resource and ecological functions or the wellbeing, lifestyle and livelihood of the communities and peoples who depend on them.

Immediate objectives of EIA are to:

* improve the environmental design of the proposal;
* ensure that resources are used appropriately and efficiently;
* identify appropriate measures for mitigating the potential impacts of the proposal; and
* facilitate informed decision making, including setting the environmental terms and conditions for implementing the proposal.

Long term objectives of EIA are to:

* protect human health and safety;
* avoid irreversible changes and serious damage to the environment;
* safeguard valued resources, natural areas and ecosystem components; and
* enhance the social aspects of the proposal.

**1.2. Nature and Scope of Environmental Issues and Impacts**

Numerous reports on the state of the world indicate that the world society is facing different environmental problems. The Global Environmental Outlook (GEO) prepared by UNEP provides an authoritative statement of the major issues and their regional variations. In the GEO-2000 report, UNEP advises that full scale emergencies now exist on a number of issues, including water scarcity, land degradation, tropical forest clearance, species loss and climate warming. Some of these issues, such as climate warming and biodiversity loss, are global or so pervasive that they affect all countries. Other environmental problems are concentrated regionally and thus affect only certain countries or are more serious for some than others.

The major environmental challenges facing different parts of the world are listed in the table below. This sample is a starting point for discussion by participants to verify and identify regional and local examples that are of most relevance to their country, taking account of both current issues and future trends. For example, many small island states and delta regions of larger countries are vulnerable to natural hazards and threatened by sea level rise due to climate warming. Other countries are likely to experience increases in water scarcity and associated environmental stresses as a result of climate change.

| **Major Environmental Issues in Developing Regions** |
| --- |
| **Developing Countries** | **Major Environmental Issues** |
| **Africa**  | The continent has the world’s poorest and most resource dependent population. It also carries the highest health burden due to severe environmental problems. These include desertification and soil degradation, declining food security, and increasing water scarcity and stress in north, east and southern Africa.  |
| **Asia and the Pacific**  | The region has high population densities in Southern and South East Asia. Rapid economic growth, urbanization and industrialization have helped in poverty alleviation but also increased pressure on land and water resources, widespread environmental degradation and high pollution levels. Mega- cities are a particular focus of environmental and health concerns.  |
| **Eastern Europe and Central Asia**  | Despite progress with economic restructuring and environmental clean up, there is a legacy of industrial pollution and contaminated land. In many areas, emissions of particulates, SO2, lead, heavy metals and toxic chemicals continue to expose the residents to health risks, and, in the Balkans, war and regional conflict have exacted a heavy environmental and social toll.  |
| **Latin America and the Caribbean**  | Approximately three-quarters of the population live in urban areas. Many cities are poor, overcrowded, polluted and lack basic infrastructure. The major green issue is the destruction of tropical forests and consequent loss of biodiversity, which is especially serious in the Amazon basin.  |
| **Middle East**  | Most land is either subject to desertification or vulnerable to deterioration from saline, alkaline and/or nutrient deposition. Water resources are under severe pressure and groundwater sources are in a critical condition. Rapid and uncontrolled urbanization has caused worsening air and water pollution in urban centers.  |

*Sources: UNEP, 1999; World Bank, 2000.*

When undertaking EIA, a comprehensive view should be taken of the linkages and interactions among the issues under review. Also, the EIA should identify both the benefits and costs of development. In practice, EIA often focuses on the adverse environmental impacts of proposed actions. This is done by reference to certain **key characteristics**, which establish the potentially significant effects (see the table below).

The impacts of a development proposal examined in EIA can be direct, such as the effect of toxic discharge on air and water quality, or indirect, such as the effect on human health from exposure to particulates or contaminants, which have built up in food chains. Other environmental and social impacts are induced, for example by a new road opening up an undeveloped area to subsequent settlement or by involuntary resettlement of people displaced by the construction of a large reservoir. Certain adverse impacts may appear relatively insignificant when considered in the context of an individual action or proposal but have a cumulative effect on the environment when added to all other actions and proposals; for example, deforestation resulting from plot by plot clearance for subsistence agriculture. A fuller discussion of environmental impacts and their analysis can be found in under the section Impact analysis.

| **Typology of Environmental Impacts** |
| --- |
| **Category of Impacts**  | **Types of Impacts**  |
| **Type**  | biophysical, social, health or economic  |
| **Nature**  | direct or indirect, cumulative, Positive or negative etc.  |
| **Magnitude or severity**  | high, moderate, low  |
| **Extent**  | local, regional, trans-boundary or global  |
| **Timing**  | immediate/long term  |
| **Duration**  | temporary/permanent  |
| **Uncertainty**  | Low likelihood/high probability  |
| **Reversibility**  | reversible/irreversible  |
| **Significance\***  | unimportant/important  |

*\*Impact significance is not necessarily related to the impact magnitude. Sometimes very small impacts, such as the disturbance of the nest of a pair of endangered birds, may be significant. When determining the significance of the potential impacts of a proposal, all of the above factors should be taken into consideration.* (More detail on impact assessment is contained in unit 5).

In many early examples of EIA practice, only the **biophysical** impacts of proposals were considered (such as effects on air and water quality, flora and fauna, noise levels, climate and hydrological systems). Increasingly EIA processes are used to analyze a range of impact types within a single framework. These include **social,** **health**, and **economic** aspects. However, this trend toward integrated assessment for decision-making is by no means universal or uniform. Even in EIA systems where this trend is well established, the degree and extent of integration varies with legal requirements and accepted practice. In some countries, social impacts are not assessed or are given only limited consideration. In other countries, EIAs are supplemented by related, but separate studies of social and health impacts.

Despite a lack of internationally consistent practice, integrated impact assessment, linking biophysical and socio-economic effects, is identified as an important priority in Agenda 21. As a widely adopted process that already covers other impacts, EIA is recognized as one of the best available mechanisms for implementing an integrated approach. In practice, achieving this approach will require greater attention to be given to the identification of social, health and other impacts in the EIA process. This aspect is addressed further under the section Impact analysis.

**1.3. Core Values and Guiding Principles of EIA Good Practice**

**Core Values of EIA**

EIA is one of a number of policy tools that are used to evaluate project proposals. It is also a relatively recent development. The **three core values** on which the EIA process is based are:

* **Integrity -** the EIA process should meet internationally accepted requirements and standards of practice;
* **Utility -** the EIA process should provide the information which is sufficient and relevant for decision-making; and
* **Sustainability -** the EIA process should result in the implementation of environmental safeguards which are sufficient to mitigate serious adverse effects and avoid irreversible loss of resource and ecosystem functions.

Basic or guiding principles of EIA good practice are listed below. These are applicable to all types of proposals and by all EIA systems. When applying or referring to them, it is important to consider the principles as a single package, recognizing their varying interrelationships. For example, some principles overlap (e.g., transparent and participative); others may be counteracting if considered without reference to the broader framework (e.g. rigour and efficiency). The principles should be applied as part of a systematic and balanced approach, having regard to the context and circumstances.

**Guiding Principles of EIA Good Practice**

**Principles Practical Application**

**Purposive** EIA should meet its aims of informing decision making and ensuring an appropriate level of environmental protection and human health.

**Focused** EIA should concentrate on significant environmental effects, taking into account the issues that matter.

**Adaptive** EIA should be adjusted to the realities, issues and circumstances of the proposals under review.

**Participative** EIA should provide appropriate opportunities to inform and involve the interested and affected publics, and their inputs and concerns should be addressed explicitly.

**Transparent** EIA should be a clear, easily understood and open process, with early notification procedure, access to documentation, and a public record of decisions taken and reasons for them.

**Rigorous** EIA should apply the best practicable methodologies to address the impacts and issues being investigated.

**Practical** EIA should identify measures for impact mitigation that work and can be implemented.

**Credible** EIA should be carried out with professionalism, rigor, fairness, objectivity, impartiality and balance.

**Efficient** EIA should impose the minimum cost burden on proponents consistent with meeting process requirements and objectives.

*Source: Sadler, 1996; IAIA and IEMA, 1999.*

**1.4. Key Elements o of EIA Process**

EIA systems can be described in reference to **three** components:

1. The **legal and institutional framework** of regulation, guidance and procedure, which establishes the requirements to conduct EIA;
2. The **steps** and **activities** of the **EIA process**, as applied to specific types of proposals; and
3. The **practice/performance and outcomes of EIA**, as evidenced by the quality of EIA reports prepared, the decisions taken and the environmental benefits delivered.

**1. Legal and Institutional Framework**

The provision for EIA may be made through legislation, administrative order or policy directive. Many countries have now enacted some type of EIA legislation, which generally can be classified into either a comprehensive or enabling law. Clear and specific legal provision is internationally accepted as the most appropriate basis for EIA. In many cases, regulations (mandatory rules) and procedural guidance (advisory interpretation) elaborate how EIA legislation is to be implemented. In this Section, note is made only of the main features of the EIA legal and institutional frameworks. These also comprise points of reference for developing or strengthening an EIA system:

**i. Basic Responsibilities**

The **proponent/owner** of the project normally carries out the EIA in accordance with directions given by the competent authority (usually the agency which makes the final decision on the proposal but in certain cases an independent commission or panel). An **environment agency** (or in some cases a specialized EIA body) supervises the process and reviews the study with inputs from other government departments. Usually, EIA studies are carried out by **an interdisciplinary team**, which is appointed specifically to the task and has an appropriate range of scientific, economic and social expertise.

**ii. Scope of Application**

Some EIA systems are relatively narrow in coverage; e.g. limited to projects of a specified type and size. Others have a broader range, for example encompassing all proposals that have potentially significant adverse environmental impacts. In addition, the environment is defined broadly; for example to include social, health and cumulative effects. The inclusions of these broader aspects of EIA are now accepted as the international standard of good practice and their coverage should be mandatory.

**iii. Consideration of Alternatives**

Consideration of alternatives is mandatory in some EIA systems but discretionary/optional in others. Varied provision is made for including a range of alternatives to a proposal, and there are different requirements for the evaluation and comparison of alternatives as part of the EIA process. At a minimum, explicit provision should be made for the consideration of the main or reasonable alternatives to a proposal (including no action). This component is a critical determinant of effective EIA.

**iv. Public Involvement**

This is a cornerstone/basis of EIA and most systems include provision for public involvement. However, there are marked differences in specific requirements; e.g. regarding access to information, procedures for notification and involvement of the public, the stage of the EIA process at which these are applied and third party rights of appeal. At a minimum, public involvement should take account of the concerns of those directly affected by a proposal/project.

**v. Quality Control and Assurance**

Within EIA systems, the components described above provide a set of legal and institutional controls on the quality and effectiveness of the process. In addition, the main stages of the EIA process itself constitute a further set of procedural **checks and balances.** The respective functions of each stage are described below; however, they should be applied iteratively as part of a whole process approach to provide EIA quality assurance.

**2. Stages and Activities of EIA Process**

The particular components, stages and activities of an EIA process will depend upon the requirements of the country or donor. However, most EIA processes have a common structure. Typically, **the EIA process begins with screening** to ensure time and resources are directed at the proposals that matter environmentally. **It should end with some form of follow up on the implementation of the decisions and actions taken** as a result of an EIA report (The steps will be discussed from unit 3 onward).

**3. EIA Practice and Outcomes**

Marked variations occur in the quality of EIA practice and outcomes among countries, reflecting the legal provisions, institutional arrangements and procedures that are in force in different jurisdictions. In addition, the quality of EIA practice varies on a case-by-case basis within the same system, depending upon **events**, the **complexity of the proposal**, the **experience of those involved** and the **time and money allocated**. Strengths and weaknesses of EIA practice are well documented in the literature, generally and with reference to the experience of certain countries and types of projects.

Widely recognized **deficiencies/weaknesses** of EIA practice include:

* **Technical shortcomings**- expressed by the poor quality of many EIA reports. The accuracy of impact predictions, the utility of mitigation and management measures, and the relevance of reports for decision-making often fall short of internationally accepted standards.
* **Procedural limitations-** including inconsistencies in process administration and guidance. Time delays and costs of applying EA remain a serious concern for project proponents/owners. Affected communities are more concerned with the lack of quality control of EIA studies or enforcement of mitigation measures.
* **Structural issues**- stemming from the application of EIA as a separate process, unrelated to the project cycle or the larger context of decision making.

In order to be effective, EIA requires a **coherent policy-planning framework** and **systematic follow up procedures**.

What constitute **good outcomes for EIA practice**? Where international standards apply or can be approximated, the following targets should be within the reach of EIA practice:

* screens out environmentally unsound projects;
* modifies the design of feasible proposals to reduce their environmental impact;
* identifies the best practicable environmental option;
* predicts the significant adverse effects of proposals with reasonable accuracy;
* identifies mitigation measures that work successfully to avoid, reduce and offset/compensate for major impacts;
* influences decision making and approvals and the implementation of terms and conditions; and
* results in environmental gains and benefits relative to other option.

**1.5. Benefits and Costs of EIA**

Although there are costs associated with undertaking EIA, experience has shown that the potential savings over the life of a project can repay the investment many times over. The savings can be economic (e.g. identification of least cost alternative) as well as environmental (e.g. impact reduction, maintaining other resource use opportunities). Generally the earlier EIA process is introduced in the project cycle, the greater the potential returns. When EIA is integrated into the project preparation phase, environmental design considerations can be introduced in the first place rather than modifying the proposal later.

**Benefits**

The benefits of EIA can be direct, such as the improved design or location of a project, or indirect, such as better quality EIA work or raised environmental awareness of the personnel involved in the project. In these cases, there will be with flow-on effects in their future work. As mentioned above, these potential gains from EIA increase as far as the process is applied at the earlier in the design process.

In general the benefits of EIA include:

* **Better environmental planning and design of a proposal.** Carrying out an EIA entails an analysis of alternatives in the design and location of projects. This can result in the selection of an improved technology, which lowers waste outputs or an environmentally optimum location for a project.

A well-designed project can minimize risks and impacts on the environment and people, and thereby avoid associated costs of remedial treatment or compensation for damage.

* **Ensuring compliance/agreement with environmental standards**. Compliance with environmental standards reduces damage to the environment and disruption to communities. It also avoids the likelihood of penalties, fines and loss of trust and credibility.
* **Savings in capital and operating costs.** EIA can avoid the excessive costs of unanticipated impacts. These can rise if environmental problems have not been considered from the start of proposal design and require rectification later. An anticipated and avoid approach is much cheaper than react and cure. Generally, **changes which must be made late in the project cycle are the most expensive.**
* **Reduced time and costs of approvals of development projects.** If all environmental concerns have been taken into account properly before submission for project approval, then it is unlikely that delays will occur as a result of decision-makers asking for additional information or alterations to mitigation measures. Increased project acceptance by the public. This is achieved by an open and transparent EIA process, with provision of opportunities for public involvement of people who are most directly affected by and interested in the proposal, in an appropriate way that suits their needs.

**Costs**

It can be difficult to determine the exact costs of an EIA because major projects typically require a large number of investigations and reports, often for closely related purposes (e.g. engineering feasibility studies of hydrology and surface materials). The World Bank notes that the cost of preparing an EIA rarely exceeds one per cent of the project costs and this percentage can be reduced further if local personnel are used to do most of the work. For Bank projects, the relative cost of an EIA typically ranges from only 0.06 per cent to 0.10 per cent of total project costs. The total cost of an EIA might range from a few thousand dollars for a very small project, to over a million dollars for a large and complex project, which has a significant environmental impact and requires extensive data collection and analysis.

Although many proponents complain that EIA causes excessive delays in projects, many of these are caused by poor administration of the process rather than by the process itself. These occur when:

* the EIA is commenced/started too late in the project cycle;
* the terms of reference are poorly drafted;.
* the EIA is not managed to a schedule;
* the technical and consultative components of EIA are inadequate; and
* the EIA report is incomplete or deficient as a basis for decision making.

Similar considerations apply to the timeframe for the EIA process. Most projects only require screening and might take only an hour or two of work. Where further EIA work is necessary, the time taken can range from a few days or weeks, for a small irrigation or a minor infrastructure project, to two years or more for a large dam or a major infrastructure project. Generally speaking, the costs and time involved in EIA should decrease as experience is gained with the process and there is a better understanding of the impacts associated with different types of projects and the use of appropriate methods. Over a longer timeframe, the availability of baseline data should also increase.

**UNIT 2- Public Involvement**

**2.1. Introduction: What is Public Involvement?**

Public involvement is a fundamental principle of the EIA process. **Timely**, **well** **planned** and **appropriately implemented** public involvement programs will contribute to EIA studies and to the successful design, implementation, operation and management of proposals. Specifically public involvement is a valuable source of information on key impacts, potential mitigation measures and the identification and selection of alternatives. It also ensures the EIA process is open, transparent and healthy, characterized by defensible analysis.

Nearly all EIA systems make provision for some type of public involvement. This term includes public consultation (or dialogue) and public participation, which is a more interactive and intensive process of stakeholder engagement. Most EIA processes are undertaken through consultation rather than participation. At a minimum, public involvement must provide an opportunity for those directly affected by a proposal to express their views regarding the proposal and its environmental and social impacts.

All participants in the EIA process are stakeholders, who pursue particular interests and hold different views and preferences. Full public involvement, open to all affected and interested parties, provides the best means of ensuring the EIA process is fair and credible. It allows decision-makers and participants themselves to gain an understanding of the diversity and balance of opinion on the issues at stake. The final decision can then be made in a fully informed & transparent manner, considering all the interests & and the views by stakeholders & the public at large.

The **purpose or objectives** of public involvement is to:

* inform the stakeholders about the proposal and its likely effects;
* canvass their inputs, views and concerns; and
* take account of the information and views of the public in the EIA and decision making
* obtain local and traditional knowledge that may be useful for decision-making;
* facilitate consideration of alternatives, mitigation measures and tradeoffs;
* ensure that important impacts are not overlooked and benefits are maximized;
* reduce conflict through the early identification of debatable or conflicting issues;
* provide an opportunity for the public to influence project design in a positive manner (thereby creating a sense of ownership of the proposal);
* improve transparency and accountability of decision-making; and
* increase public confidence in the EIA process

**Approaches of Public Involvement**

Key terms of public involvement are described here below. The basic types of public involvement are organized as a ladder of steps of increasing intensity and interaction. When reviewing them, note their different requirements with regard to planning and designing a public involvement program.

* 1. ***Information*** ***and notification***, strictly speaking, are preconditions of meaningful public involvement. On its own, information disclosure is not a sufficient provision in public involvement for an EIA of a major proposal.
	2. ***Consultation*** denotes an exchange of information designed to canvass/investigate the views of stakeholders on a proposal and its impacts.
	3. ***Participation*** is a more interactive process of engaging the public in addressing the issues, establishing areas of agreement and disagreement and trying to reach common positions.
	4. ***Negotiation*** among stakeholders is an *alternative dispute resolution* (ADR) mechanism, which is based on joint fact-finding, consensus building and mutual accommodation of different interests.

In practice, public involvement in EIA largely corresponds to consultation. However, participation will be appropriate in many circumstances, for example, where a local population is displaced or relocated as a result of a project. A few countries also make provision for mediation or negotiation facilitated by a neutral third party. In principle, these approaches to public involvement in EIA are distinctive and relatively separate. However, they may be used in combination; for example, consultation and participation can be appropriate at different stages of the same EIA process.

**Levels and forms of Public Involvement**

**Level Form of Involvement**

**Informing** One way flow of information from the proponent to the public

**Consulting** Two way flow of information between the proponent and the public

with opportunities for the public to express views on the proposal.

**Participating** Interactive exchange between the proponent and the public encompassing shared analysis and agenda setting and the development of understood and agreed positions on the proposal and its impacts.

**Negotiating** Face to face discussion between the proponent and key stakeholders to build consensus and reach a mutually acceptable resolution of issues, for example on a package of impact mitigation and compensation measures.

*Adapted from Bass et al (1995)*

**2.2. Stakeholders Involved**

The range of stakeholders involved in an EIA typically includes:

* the local people/ those people, individuals, groups and communities, who are affected by the proposal/;
* the proponent and other project beneficiaries;
* government agencies;
* NGOs and interest groups; and
* Others, such as donors, the private sector, academics etc.

**Local people**

Individuals or groups in the affected community will want to know what is proposed; what the likely impacts are; and how their concerns will be understood and taken into account. They will want assurances that their views will be carefully listened to and considered on their merits. They will want proponents to address their concerns. They will also have knowledge of the local environment and community that can be tapped and incorporated into baseline data.

**Proponents**

Understandably, proponents will wish to shape the proposal to give it the best chance of success. Often, this involves trying to create public understanding and acceptance of the proposal through the provision of basic information. More creatively, project design can be improved through using public inputs on alternatives and mitigation and understanding local knowledge and values.

**Government Agencies**

The government agencies involved in the EIA process will want to have their policy and regulatory responsibilities addressed in impact analysis and mitigation consideration. For the competent authority, an effective public involvement program can mean the proposal may be less likely to become controversial in the later stages of the process. For the responsible EIA agency, the concern will be whether or not the public involvement process conforms to requirements and procedures.

**NGOs/Interest groups**

Comments from NGOs can provide a useful policy perspective on a proposal; for example, the relationship of the proposal to sustainability objectives and strategy. Their views may also be helpful when there are difficulties with involving local people. However, this surrogate approach should be considered as exceptional; it cannot substitute for or replace views which should be requested directly.

**Other Interested groups**

Other interested groups include those who are experts in particular fields and can make a significant contribution to the EIA study. The advice and knowledge of government agencies and the industry sector most directly concerned with the proposal should always be sought. However, in many cases, substantive information about the environmental setting and effects will come from outside sources.

The different benefits provided for key groups by effective public participation are described in the table below. However, these benefits may not be always realized or acknowledged by participants. Each of the above groups may perceive the benefits gained from public involvement in the EIA process through the lens of their own experience and interests.

|  |
| --- |
| **The benefits of effective public participation for different groups** |
| **The proponent** | **The decision-maker** | **Affected communities** |
| Raises the proponent’s awareness of the potential impacts of a proposal on the environment and the affected community. | Achieves more informed and accountable decision making | Provides an opportunity to raise concerns and influence the decision-making process. |
| Legitimizes proposals and ensures greater acceptance and support. | Provides increased assurance that all issues of legitimate concern have been addressed | Provides an opportunity to gain a better understanding and knowledge about the environmental impacts and risks that may arise. |
| Improves public trust and confidence. | Demonstrates fairness and transparency, avoiding accusations of decisions being made ‘behind closed doors’ | Increases awareness of how decision-making processes work, who makes decisions and on what basis |
| Assists by obtaining local information/data. | Promotes good relations with the proponent and third parties. | Empowers people, providing the knowledge that they can influence decision making and creating a greater sense of social responsibility |
| Avoids potentially costly delays later in the process by resolving conflict early | Avoids potentially costly delays later in the process by resolving conflict early. | Ensures all relevant issues and concerns are dealt with prior to the decision |
| *Source: Institute of Environmental Management & Assessment (1999)* |

**2.3. Principles of Public Involvement**

**Key principles** for public involvement, which are widely agreed, are:

* **Inclusive** – covers all stakeholders;
* **Open** **and transparent** – steps and activities are understood;
* **Relevant** – focused on the issues that matter;
* **Fair** – conducted impartially and without bias toward any stakeholder;
* **Responsive** – to stakeholder requirements and inputs; and
* **Credible** – builds confidence and trust.

**2.4. Scope of Public Involvement**

The scope of public involvement and its relationship to the EIA process should be proportional with the significance of the environmental and social impacts for local people. Ideally, public involvement should start during the preparatory stage of project development and continue throughout the EIA process. This is particularly important for major projects that affect people livelihood and culture. **Five main steps** at which public involvement can occur in the EIA process are discussed below.

* + 1. **Screening**

For certain categories of proposal, the responsible authority may consult with people likely to be affected in order to gain a better understanding of the nature and significance of the likely impacts. This information can assist **in determining if an EIA is required and at what level**. In addition, the early identification of affected parties and their concerns provides information that can be incorporated into the scoping stage of EIA and assists future planning for public involvement.

* 1. **Scoping**

Public involvement is commonly undertaken at the scoping stage. This is critical **to ensure that all the significant issues are identified, local information about the project area is gathered,** and **alternative ways of achieving the project objectives are considered**. Terms of Reference for an EIA provide a means of responding to and checking against these inputs. They should also outline any specific requirements for public involvement in EIA preparation, review & follow up

* 1. **Impact Analysis and Mitigation**

The further involvement of the public in these phases of EIA preparation can help to:

* avoid biases and inaccuracies in analysis;
* identify local values and preferences;
* assist in the consideration of mitigation measures; and
* select a best practicable alternative.
	1. **Review of EIA Quality**

A major opportunity for public involvement occurs when EIA reports are exhibited for comment. However, making written comments is discouraging to all but the educated and literate. Other means of achieving responses should be provided where proposals are controversial. Public hearings or meetings may be held as part of EIA review. They can be formal or informal but should be structured in a way which best allows those affected to have their say. Many people are not comfortable in speaking in public and other or additional mechanisms may be needed.

* 1. **Implementation and Follow up**

The environmental impacts of major projects will be monitored during construction and operational start up, with corrective action taken where. Local representatives should examine and participate in the follow up process. This arrangement can assist proponents and approval agencies to respond to problems as they arise. It can also help to promote good relations with local communities that are affected by a development.

**UNIT 3- Screening**

**3.1. Screening Procedure**

Screening is the first key decision of the EIA process. Some type of screening procedure is necessary because of the large number of projects or activities that are potentially subject to EIA.

The purpose of screening is **to determine whether a proposal requires an EIA or not**. It is intended to ensure that the form or level of any EIA review is commensurate with the importance of the issues raised by a proposal.

The conduct of screening thus involves making a preliminary determination of the expected impact of a proposal on the environment and of its relative significance. A certain level of *basic information about the proposal and its location* is required for this purpose. The time taken to complete the screening process will depend upon the type of proposal, the environmental setting and the degree of experience or understanding of its potential effects. Most proposals can be screened very quickly (in an hour or less) but some will take longer and a few will require an extended screening or initial assessment. Similarly, the majority of proposals may have few or no impacts and will be screened out of the EIA process. A smaller number of proposals will require further assessment. Only a limited number of proposals, usually major projects, will demand a full EIA because they are known or considered to have potentially significant adverse impacts on the environment; for example, on human health and safety, rare or endangered species, protected areas, fragile or valued ecosystems, biological diversity, air & water quality, or the lifestyle and livelihood of local communities.

The screening process can have one of the following **four outcomes**:

* No further level of EIA is required;
* A full and comprehensive EIA is required;
* A more limited EIA is required (often called preliminary or initial assessment); or
* Further study is necessary to determine the level of EIA required (often called an initial environmental evaluation or examination [IEE]).

Screening establishes the basis for scoping, which identifies the key impacts to be studied and establishes terms of reference for an EIA. Many EIA systems have formal screening and scoping procedures. In some cases, however, these terms may be used differently or applied at the good judgment of the proponent. Also, on occasion, the screening and scoping stages may overlap, for example, when a further study (or IEE) is undertaken to determine whether or not the potential impacts are significant enough to warrant a full EIA.

The requirements for screening and the procedure to be followed are often defined in the applicable EIA law or regulations. In many cases, the proposals to which EIA applies are listed in an annex. Usually, the proponent is responsible for carrying out screening, although this is done by the competent authority in some EIA systems. Whatever the requirements, screening should occur as early as possible in the development of the proposal so that the proponent and other participants are aware of the EIA obligations. It should be applied systematically and consistently (so that the same decisions would be reached if others conducted the screening process).

The screening procedures employed for this purpose can be classified into two broad, overlapping approaches:

* ***Prescriptive or Standardized approach*** - proposals subject to or exempt from EIA are defined or listed in legislation and regulations; and
* ***Discretionary or Customized approach*** - proposals are screened on an individual or case-by-case base, using indicative guidance.

Specific methods used in screening include:

* legal (or policy) definition of proposals to which EIA does or does not apply;
* inclusion list of projects (with or without thresholds) for which an EIA is automatically required; exclusion list of activities which do not require EIA because they are insignificant or are exempt by law (e.g. national security or emergency activities); and
* criteria for case-by-case screening of proposals to identify those requiring an EIA because of their potentially significant environmental effects.

Both prescriptive and discretionary approaches have a place and their specific procedures can be combined into a comprehensive procedure. Where inclusive project lists are used, the nature of most proposals will be immediately visible. However, some proposals will be on the borderline in relation to a listed threshold and for others, the environmental impacts may be unclear or uncertain. In these situations, case-by-case screening should be undertaken, applying any indicative guidelines & criteria established for this purpose. This process gives the proponent greater judgment than mandatory lists in determining the requirement for EIA.

Screening is a flexible process and can be extended into preliminary forms of EIA study. These extended screening procedures include:

* initial environmental examination carried out in cases where the environmental impacts of a proposal are uncertain or unknown (e.g. new technologies or undeveloped areas); and
* environmental overview carried out as a rapid assessment of the environmental issues

**3.2. Projects List for Screening**

Project lists are widely used to screen proposals. These lists are of two types. Most are **inclusion lists**, which describe the project types and size/scale thresholds that are known or considered to have significant or serious environmental impacts. Usually, listed projects that fall within these predetermined thresholds will be subject automatically to full and comprehensive EIA. Some EIA systems also maintain **exclusion lists** of activities that are exempt because they are known to have little or no environmental impact. The inclusion lists used by countries and international organizations differ in content, comprehensiveness, threshold levels and requirements for mandatory application. In certain EIA systems, scale thresholds are specified for each type of listed project for which an EIA is mandatory. Other projects that may require an EIA are screened individually against environmental significance criteria, such as emission levels or proximity to sensitive and protected areas.

Use of these lists is reported by the World Bank to be a reliable aid to the classification of proposals into one of *three categories*:

* Projects **requiring a full EIA** because of their likely environmental effects;
* Projects **not requiring a full EIA** but **demanding a further level of assessment** ; and
* Projects **not requiring further environmental analysis** (for example health and nutrition, institutional and human resource development and technical assistance).

**Environmental Screening World Bank classification**

|  |  |  |
| --- | --- | --- |
| **Category** | **Scope of impacts** | **Projects or components** |
| **Category A** | For projects likely to **have significant adverse environmental impacts that are serious** (i.e., irreversible, affect vulnerable ethnic minorities, involve involuntary resettlement, or affect cultural heritage sites), diverse, or unprecedented, or that affect an area broader than the sites of facilities subject to physical works. **A full EIA is required** | * dams and reservoirs forestry and production projects;
* industrial plants (large scale);
* irrigation, drainage, and flood control (large scale);
* land clearance and leveling (large scale);
* mineral development (including oil and gas);
* port and harbor development;
* reclamation and new land development;
* resettlement and new land development;
* river basin development;
* thermal and hydropower dev’t;
* manufacture, transportation, and use of pesticides; and
* other hazardous and/or toxic materials.
 |
| **Category B** | For projects likely to **have adverse environmental impacts that are less significant** than those of Category A projects, meaning that few if any of the impacts are likely to be irreversible, that they are site-specific, and that mitigation measures can be designed more readily than for Category A projects. Normally, **a limited EIA will be undertaken** to identify suitable mitigation and management measures, and incorporate them into the project. | * Agro-industries;
* electrical transmission;
* aquaculture and drainage (small-scale);
* irrigation and drainage (small-scale);
* renewable energy;
* rural electrification;
* tourism;
* rural water supply and sanitation;
* watershed projects (management or rehabilitation); and
* rehabilitation, maintenance, and upgrading projects (small-scale).
 |
| **Category C** | For projects that are likely to have **minimal or no adverse environmental impacts**. **No EIA is required**.  | * None
 |

 *Source: World Bank (1993)*

Listed projects provide a standardized framework for screening proposals. This approach is simple to apply, at least in its most basic form of identifying the type and size of project for which EIA is mandatory or almost certainly required. However, project lists should be used carefully and with due regard to their weaknesses, especially if they are the only basis for screening.

World Bank and international experience indicates that project lists should be used flexibly in screening proposals. Reference should be made to the **location** and **setting of the proposal**, as well as **its scale**. A low-head hydropower dam or small-scale mine (<100 ha) normally would not merit full EIA. However, the proposal may need to be reclassified if it is located in or near sensitive and valued ecosystems, or heritage resources, displaces people who are particularly vulnerable and difficult to resettle or has evident cumulative impacts (e.g. one of a series of quarries or dams). The methods available for this purpose are discussed below.

As necessary**, project lists should be revised and updated over time** to incorporate increasing experience and to respond to new demands. The reform of project lists and thresholds preferably should take place through a consultative process, involving government agencies, industry and the public. When developing project lists from scratch, **care should be taken not to adopt those established elsewhere without adequate review** of their suitability. Project lists are drawn up with reference to the developmental and physical characteristics that are particular to a country or jurisdiction, and it is **unlikely they will to be directly transferable without alteration**.

**3.3. Preliminary EIA**

Case-by-case screening is carried out when the significance of the potential environmental impact of a proposal is unclear or uncertain. This process typically applies to proposals that fall just below or close to the thresholds established for listed projects. In addition, proposals may be subjected to screening if they are located in sensitive areas or there is a potential for cumulative effects in combination with other current and expected activities. It has gained a degree of international acceptance as a standard of good practice. The specific criteria for case-by-case screening differ from country to country. Typically, however, they are based on a number of common factors related to the consideration of the significance of environmental impacts. These include the **location of proposals**, **environmental sensitivity** and any **likely health and social effects on the local population**. In this context, reference may be made to the screening criteria listed in the European Directive, which apply to the selection of listed projects for which EIA is not mandatory. These criteria may be adapted to wider use in case-by-case screening. A proposal can be tested for significance by taking account of:

* location near to protected or designated areas or within landscapes of special heritage value;
* existing land use(s) and commitments;
* the relative abundance, quality and *regenerative capacity* of natural resources;
* the *absorption capacity* of the natural environment, paying particular attention to wetlands, coastal zones, mountain and forest areas; and
* areas in which the *environmental quality standards laid down in law have been exceeded already*.

Using the emphasized aspects above, consideration can be given to sustainability criteria when carrying out case-by-case screening. However, this approach demands considerable information about the environment, which is unlikely to be available at a relatively early stage in project development. In these circumstances, only a qualified determination of the environmental significance of a proposal may be possible and screening decisions must be open to change if new information indicates the advisability of reclassification.

Certain proposals may be subjected to an extended screening or initial assessment (also called a preliminary EIA). Such an approach can be used when the requirement for EIA could not be reasonably determined by the application of the screening procedures described previously; for example when a proposal involves use of a new technology or is located in a near natural or frontier area or involves discharges into a water body that may exceed health or environmental standards. Often, this process, itself, may be sufficient to complete the requirement for EIA established by a particular country. In this case, a screening report should describe the results and identify any mitigation measures or actions that need to be taken.

When undertaking this type of preliminary EIA study, the proponent or competent authority may need to gather considerable information. A checklist of the types of information that could be relevant for such a study is summarized below. This is accompanied by a framework of criteria and questions that can help in conducting a preliminary. It is based upon Australian and New Zealand EIA practice and provides a detailed procedure for undertaking an extended screening or initial assessment. As and where necessary, it could be adapted to wider application in conjunction with the methods described below.

Information that may be required for a preliminary EIA study includes:

* a description of the proposal;
* applicable policies, plans and regulations, including environmental standards and objectives;
* the characteristics of the environment, including land use, significant resources, critical ecological functions, pollution and emission levels etc.;
* the potential impacts of the proposal and their likely significance;
* the degree of public concern and interest about the proposal.

**Initial Environmental Evaluation or Examination (IEE)**

In some EIA systems, an IEE is required when the potential environmental impacts of a proposal cannot be established by the application of standard screening procedures. Typically, an IEE is a relatively low-cost analysis that makes use of information already available. It is carried out using EIA procedures and methods. For example, key issues can be identified by a rapid scoping exercise, based on consultation with local people and agencies. A site or area visit should take place to survey the current situation and obtain baseline information. Simple methods, such as a checklist or matrix, are used in impact identification and often focus on appropriate mitigation measures. Depending on its findings, the IEE report can be used either as a scoping document when a proposal is referred to a full EIA or to support environmentally sound planning and design when a proposal does not require further review.

An IEE is a preliminary EIA study that:

* describes the proposal and the environmental setting;
* considers alternatives to improve the environmental benefits;
* addresses the concerns of the local community;
* identifies the potential environmental effects;
* identifies measures to mitigate adverse impacts; and
* describes, as necessary, environmental monitoring and management plans

**3.4. Criteria for Determination of the need for and Level of EIA**

The major criteria to determine the need for and level of EIA include:

**i. Character of the receiving environment**

Consider:

* Is it, or is it likely to be, part of the conservation land?
* Is it an existing or potential environmentally significant area?
* Is it vulnerable to major natural or induced hazards?
* Is it a special purpose area?
* Is it an area where human communities are vulnerable?
* Does it involve a renewable or a non-renewable resource?
* Is it a degraded area, subject to significant risk levels, or a potentially contaminated site?

**ii. Potential impact of proposal**

Consider:

* Will implementation or construction, operation and/or decommissioning of the proposal have the potential to cause significant changes to the receiving environment (on-site or off-site, trans boundary, short term or long term)?
* Could implementation of the proposal give rise to health impacts or unsafe conditions?
* Will the proposal significantly divert resources to the damage of other natural and human communities?

*NOTE: This should include consideration of the magnitude of the impacts, their spatial extent, the duration and the intensity of change, the total life cycle and whether and how the impacts are manageable.*

**iii. Resilience/flexibility/recovery of natural and human environments to cope with change**

Consider:

* Can the receiving environment absorb the level of impact predicted without suffering irreversible change?
* What are the implications of the proposal for bio-diversity?
* Can land uses at and around the site be sustained?
* Can sustainable uses of the site be achieved beyond the life of the proposal?
* Are contingency or emergency plans proposed or in place to deal with accidental events?

*NOTE: Cumulative as well as individual impacts should be considered in the context of sustainability.*

**iv. Confidence of prediction of impacts**

Consider:

* Is the proposal sufficiently detailed and understood to enable the impacts to be established?
* Is the level and nature of change to the natural human environment sufficiently understood to allow the impact of the proposal to be predicted and managed?
* Is it practicable to monitor the predicted effects?
* Are present community values on land use and resource use known or likely to change?

**v. Presence of planning, policy framework and other decision-making processes**

Consider:

* Is the proposal consistent with existing policy frameworks?
* Do other approval processes exist to adequately assess and manage proposal impacts?
* What legislation, standard codes or guidelines are available to properly monitor and control operations and the types or quantity of the impacts?

**vi. Degree of public interest**

Consider:

* Is the proposal controversial or could it lead to controversy or concern in the community?
* Will the comfort, values or lifestyle of the community be adversely affected?
* Will large numbers of people require relocation?
* Will the proposal result in inequities between sectors of the community?

**UNIT 4- Scoping**

**4.1. Introduction: Meaning and Purpose of Scoping**

Scoping is a critical, early step in the preparation of an EIA. The scoping process **identifies the issues that are likely to be of most importance during the EIA and eliminates those that are of little concern**. Typically, this process concludes with the establishment of Terms of Reference for the preparation of an EIA. In this way, scoping ensures that EIA studies are focused on the significant effects and time and money are not wasted on unnecessary investigations.

Scoping refers to the early, open and interactive process of determining the major issues and impacts that will be important in decision-making on the proposal, and need to be addressed in an EIA. The requirements and procedures established for this purpose differ from country to country. In many EIA systems, the involvement of the public, as well as the competent authority and other responsible government agencies, is an integral part of the scoping process. **Public input helps to ensure that important issues are not overlooked** when preparing Terms of Reference and/or initiating the EIA study.

The purpose of scoping is to identify:

* the important issues to be considered in an EIA;
* the appropriate time and space boundaries of the EIA study;
* the information necessary for decision-making; and
* the significant effects and factors to be studied in detail.

In addition, the scoping process can be used to **define the feasible alternatives to a proposed action**. Not all EIA systems make provision for the generation or review of alternatives during scoping. However, consideration of alternatives during scoping is becoming accepted internationally, as an EIA good practice.

Typically, scoping begins after the completion of the screening process. However, these stages may overlap to some degree. Essentially, scoping takes forward the preliminary determination of significance made in screening to the next stage of resolution determining which issues and impacts are significant and require further study. In doing so, the scoping process places limits on the information to be gathered and analyzed in an EIA and focuses the approach to be taken.

Scoping is completed when the detailed studies required in the EIA have been specified often this involves preparing **Terms of Reference (ToR)** or an equivalent document. This document sets out **what the EIA is to cover,** **the type of information to be submitted** and **the depth of analysis that is required**. It provides guidance to the proponent on how the study should be conducted and managed. Experience shows that the **ToR should be a flexible document.** The terms may **need alteration as further information becomes available**, and new issues emerge or others are reduced in importance.

Scoping provides the foundations for an effective and efficient EIA process. When systematically carried out, scoping highlights the issues that matter and results in **ToR** for an EIA that **provide clear direction to the proponent on what is required**. This **increases the likelihood of an adequately prepared EIA report**. **It helps to avoid the problem of unfocused, voluminous reports** and **the attendant delay while their deficiencies are addressed and corrected**. Scoping thereby helps to make sure that resources are targeted on collecting the information necessary for decision-making and not wasted on undertaking excessive analysis.

The scoping process can vary in **scope, complexity and time taken**. A comprehensive approach to scoping may be needed for large-scale proposals, which have a range of impacts that are potentially significant. In other cases, scoping will be a more limited and restricted exercise. Depending on the circumstances, the scoping process can be tailored to include some or all of the aims listed below.

Key objectives of scoping are to:

* inform the public about the proposal;
* identify the main stakeholders and their concerns and values;
* define the reasonable and practical alternatives to the proposal;
* focus the important issues and significant impacts to be addressed by an EIA;
* define the boundaries for an EIA in time, space and subject matter;
* set requirements for the collection of baseline and other information; and
* establish the Terms of Reference for an EIA study.

**Guiding principles** for carrying out the scoping process include the following:

* recognize scoping is a process rather than a detached activity or event;
* design the scoping process for each proposal, taking into account the environment and people affected;
* start scoping as soon as you have sufficient information available;
* prepare an information package or circular explaining the proposal and the process;
* specify the role and contribution of the stakeholders and the public;
* take a systematic approach but implement flexibly;
* document the results to guide preparation of an EIA; and
* respond to new information and further issues raised by stakeholders.

The elements of scoping differ to some degree with the EIA requirements established by different countries and international agencies. A **comprehensive scoping** process will include all or a combination of the following activities:

* Identify the range of community and scientific concerns about a proposed project or action;
* Evaluate these concerns to identify the significant issues (and to eliminate those issues which are not important); and
* Organize and prioritize these issues to focus the information that is critical for decision making, and that will be studied in detail in the next phase of EIA.

**4.2. Approaches and Methods of Scoping**

A systematic and transparent approach should be taken to selecting and scale down the concerns, issues and impacts. This can be undertaken in three steps:

1. Compile a long list of concerns from the information available and the inputs of stakeholders. ***No attempt should be made at this stage to exclude or pre-judge concerns.***
2. Derive a short list of key issues and problem areas based on their potential significance and likely importance for decision-making on the proposal. This phase involves ***evaluating the issues against selected criteria***; for example, differentiating serious risks or threats from effects that can be mitigated.
3. **Classify and order the key issues into impact categories** by reference to policy objectives and scientific concepts, such as emission levels that may exceed health or environmental standards. Such a synthesis or aggregation provides a coherent framework for drafting the Terms of Reference (ToR) for the EIA study.

In practice, the first phase of scoping - opening out the list of concerns and issues is much easier to achieve than the next two. With few exceptions, most EIA systems experience difficulties in narrowing down and focusing on the issues that matter. This imposes certain limitations when preparing ToR, with potential knock on effects on the next stage of work on the EIA study. Ultimately, it is the responsibility of the proponent or competent authority to bring the scoping process to a conclusion.

The following public involvement methods are used in the conduct of scoping:

* notification/invitation for public comment and written submissions;
* consultation with the various stakeholders;
* public and community meetings; and
* issues workshops and facilitated discussion.

**4.3. Alternatives to be considered**

The consideration of alternatives to a proposal is a requirement of many EIA systems. It lies at the heart of the EIA process and methodology. During the scoping process, alternatives to a proposal can be generated or refined, either directly or by reference to the key issues identified. A comparison of alternatives will help to determine the best method of achieving project objectives while minimizing environmental impacts or, more creatively, indicate the most environmentally friendly or best practicable environmental option.

Often, however, the consideration of alternatives is a superficial rather than a meaningful exercise. This is particularly true of private sector proposals, where the requirement to analyze alternatives is less than for comparable public sector proposals. It is also true of all proposals that are submitted to EIA when planning is nearly complete and the components and location are fixed already. This practice is becoming less and less acceptable as EIA mature+-s and as sustainability issues and cumulative effects take on greater importance.

The consideration of alternatives is likely to be most useful when the EIA is undertaken early in the project cycle. Depending on timing, the type and range of alternatives open to consideration might include:

* **demand alternatives** (e.g. using energy more efficiently rather than building more generating capacity);
* **input or supply alternatives** (e.g. where a mix of energy sources permits);
* **activity alternatives** (e.g. providing public transport rather than increasing road capacity);
* **location alternatives**, either for the entire proposal or for components (e.g. the location of a dam and/or irrigation channels);
* **process alternatives** (e.g. use of waste-minimizing or energy-efficient technology);
* **scheduling alternatives** (e.g. for airport and transport operations, reservoir drawdown)

The development of feasible alternatives, to meet the overall objectives of the proposal calls for certain types of information and knowledge. During this process, for example, reference may be made to: **available technology**, **policy objectives**, **social attitudes**, **environmental and site constraints** and **project economics**. It is also important to make sure that the alternatives chosen for comparison with a proposal can be implemented cost-effectively. Stakeholder input can be helpful in the generation and analysis of feasible alternatives, but this needs to be used selectively.

The range of alternatives selected for analysis routinely includes the **no action alternative**. The relative impact of each alternative is compared against the baseline environment (with versus without project) to select a preferred alternative, including taking no action (which may not correspond exactly to maintaining baseline conditions because changes result from other actions).

**4.4. EIA Terms of Reference**

In concluding the scoping process, the preparation of Terms of Reference (ToR) for an EIA is an important task. Alternatively, or as a supplement to ToR, a formal scoping report may be issued. In some EIA systems, the proponent prepares a more informal document to summarize the conclusions of scoping and the approach to be taken by an EIA study. The test for ToR lies in its usefulness to and strength in successive stages of the EIA process. ToR provides guidance and direction to the proponent. The document should be comprehensive yet as concise as possible.

Terms of Reference for a full EIA can refer to some or all of the following items:

* purpose and application of the Terms of Reference;
* statement of need for and objectives of the proposal;
* project background and description;
* study area or impact zone(s) (e.g. the affected environment and community);
* applicable policy and institutional considerations;
* EIA requirements and decision-making particulars;
* provisions for public involvement;
* alternatives to be examined;
* the impacts and issues to be studied;
* the studies to be carried out (e.g. approach, time & space boundaries);
* the requirements for mitigation and monitoring;
* the information and data to be included in the EIA report;
* the timeframe for completion of the EIA process; and
* the means for making changes to the ToR if necessary.

The ToR can also contain various matters relating to EIA project management. Alternatively, these may be contained in a separate brief or specification drawn up by the proponent for the study team. The following particulars might be included:

* the proposed study schedule;
* the resources and estimated budget for the study;
* the activities and responsibilities of the study team;
* the expected outputs or deliverables from the study team; and
* the basis on which differences to the working brief will be negotiated.

**UNIT 5- Impact Analysis**

**5.1. Introduction**

Early EIAs focused only or primarily on impacts on the natural or biophysical environment (such as effects on air and water quality, flora and fauna, noise levels, climate and hydrological systems). However, over time, increased consideration has been given to social, health & economic impacts. This trend has been driven partly by public involvement in the EIA process. It is reflected by the evolving definition of the term environment in EIA legislation, guidance and practice.

In many EIA systems, a broad definition of environment is adopted. This includes effects on:

* human health and safety;
* flora, fauna, ecosystems and biological diversity;
* soil, water, air, climate and landscape;
* use of land, natural resources and raw materials;
* protected areas and designated sites of scientific, historical and cultural significance;
* heritage, recreation and amenity assets; and
* livelihood, lifestyle and wellbeing of those affected by a proposal.

Depending on the EIA system, some or all of these impacts may require analysis and evaluation. Often, however, health, social and other non-biophysical impacts are either not considered or are inadequately addressed. An alternative approach is to undertake separate, but parallel, assessments of social, health and other impacts when they are considered to be particularly important for decision-making and not adequately addressed by EIA or other similar processes (such as risk assessment). The preferable approach is to undertake an integrated analysis.

**5.2. Impact Identification**

A logical and systematic approach needs to be taken to impact identification. The aim is to take account of all of the important environmental/project impacts and interactions, making sure that indirect and cumulative effects, which may be potentially significant, are not inadvertently omitted. This process begins during screening and continues through scoping, which identifies the key issues and classifies them into impact categories for further study. In the next phase, the likely impacts are analyzed in greater detail in accordance with terms of reference specifically established for this purpose.

The most commonly used formal methods of impact identification are given in the table below.

| **Main advantages and disadvantages of impact identification methods** |
| --- |
| **Method**  |  **Advantages**  |  **Disadvantages**  |
| **Checklists** | * easy to understand and use
* good for site selection and priority setting
* simple ranking and weighting
 | * do not distinguish between direct and indirect impacts
* do not link action and impact
* the process of incorporating values can be controversial
 |
| **atrices**  | * display causal linkage between actions and impacts
* good method for displaying EIA results
 | * difficult to distinguish direct and indirect impacts
* have potential for double-counting of impacts
 |
| **Networks**  | * display causal linkage between actions and impacts
* useful in simplified form for checking for second order impacts
* handles direct and indirect impacts
 | * can become very complex if used beyond simplified version
 |
| **Overlays**  | * easy to understand
* focus and display spatial impacts
* good siting tool
 | * can be cumbersome
* poorly suited to address impact duration or probability
 |
| **GIS and computer expert** **systems**  | * excellent for impact identification and spatial analysis
* good for ‘experimenting’
 | * heavy reliance on knowledge and data
* often complex and expensive
 |

**Checklists**

Checklists annotate the environmental features or factors that need to be addressed when identifying the impacts of projects and activities. They can vary in complexity and purpose, from a simple checklist to a structured methodology or system that also assigns significance by scaling and weighting the impacts. Both simple and descriptive checklists can be improved and adapted to suit local conditions as experience with their use is gained.

Checklists provide a systematized means of identifying impacts. They also have been developed for application to particular types of projects and categories of impacts (such as dams or road building). Sectorial checklists often are useful when proponents specialize in one particular area of development. However, checklists **are not as effective in identifying higher order impacts or the inter-relationships between impacts**, and therefore, when using them, consider whether impacts other than those listed may be important.

**Matrices**

A matrix is a grid-like table that is used to **identify the interaction between project activities**, which are displayed along one axis, **and environmental characteristics**, which are displayed along the other axis. Using the table, environment-activity interactions can be noted in the appropriate cells or intersecting points in the grid. Entries are made in the cells to highlight impact severity or other features related to the nature of the impact, for instance:

* ticks or symbols can identify impact type (such as direct, indirect, cumulative) pictorially;
* numbers or a range of dot sizes can indicate scale; or
* descriptive comments can be made.

An early, well-known example is the Leopold interaction matrix. This is a comprehensive matrix, which has 88 environmental characteristics along the top axis and 100 project actions in the left hand column. Potential impacts are marked with a diagonal line in the appropriate cell and a numerical value can be assigned to indicate their magnitude and importance. Use of the Leopold matrix is less common than its adaptation to develop other, less complex matrices.

**5.3. Impact Analysis/Prediction**

Once all the important impacts have been identified, their potential size and characteristics can be predicted. Impact prediction or forecasting is a technical exercise. It utilizes physical, biological, socio-economic and cultural data to estimate the likely characteristics and parameters of impacts (e.g. magnitude, spatial occurrence etc.). A range of methods and techniques may be employed. These can be a continuum from simple methods for impact identification (described earlier) to advanced methods, often involving the application of mathematical models.

In many cases, this work will need to be carried out by specialists in the disciplines involved or in the application of models and techniques. However, the sophistication of prediction methods used should be in proportion to the scope of the EIA and relevant to the importance of the particular impact. Specialists may become involved in research and methodology that is of interest to them rather than directly related to the impact of the proposal. This can be avoided by making sure the program of research and data collection is focused on addressing the concerns outlined in the terms of reference.

Where possible, impacts should be predicted quantitatively. This makes comparison among alternatives and with baseline conditions easier and facilitates impact monitoring and auditing later in the EIA process. If quantification is difficult, then it is important to use methods that allow the impacts to be estimated and compared systematically. Rating techniques, for example, can be used to assist impact estimation (as well as assign values) where there is insufficient data, a high level of uncertainty and/or limited time and money (all common in many EIAs). The results of qualitative analysis should be communicated clearly, for example in the form of a range of graded dot sizes presented in a table.

Quantification means using numbers to indicate the impact. In most societies numbers have come to be important ways of communicating. The precision they infer gives the impression that they are true, or at least as accurate as possible. However, when dealing with the bio-physical environment and social issues there are still many situations where our understanding of causes and effects (our models) are not perfect representations of what happens in all situations. So our models are likely to provide incomplete (possibly false) information. Yet the numbers that these models produce give the impression of accuracy.

Sometimes there are few or no alternatives to qualitative description, as is in the case of scenic quality, amenity, sense of place or other landscape characteristics. Wherever possible, description should be based on some type of classification and the impacts summarized in appropriate form, for example, maps, cross-sections and/or photomontages.

In most cases, a **multi-disciplinary team will conduct the EIA study**. The terms of reference will dictate the composition of the team and the knowledge base and skills required. When organizing different specialists to address a common task or problem, it is important for the study manager to establish a clear process of communication with, and amongst, them. This should extend to communication with those responsible for overall project management, as it is often possible for design changes to be incorporated to reduce environmental impacts well before the production of the EIA report. This can result in savings of money and time to the proposal in the long run.

Impact predictions are made against a baseline established by the existing environment (or by its future state). Known as baseline studies, the collection of data on relevant biophysical, social and economic aspects provides a reference point against which the characteristics and parameters of impact related changes are analyzed and evaluated. In many cases, it is likely that the current baseline conditions will still exist when a project is implemented. However, certain projects have long lead times. In these cases, predictions may need to be made about the future state of the environment (the baseline condition for the no-development option).

When establishing a baseline, information is gathered on:

* current environmental conditions;
* current and expected trends;
* effects of proposals already being implemented; and
* effects of other predictable proposals



**An impact or effect** can be described as **the change in an environmental parameter, which results from a particular activity or intervention**. The change is the difference between the environmental parameter with the project compared to that without the project (as represented pictorially in the figure above). It is predicted or measured over a specified period and within a defined area.

**5.4. Characteristics of Environmental Impacts**

The characteristics of environmental impacts vary. Typical parameters to be taken into account in impact prediction and decision-making include:

* **Nature** (positive, negative, direct, indirect, cumulative);
* **Magnitude** (severe, moderate, low);
* **Extent/location** (area/volume covered, distribution);
* **Timing** (during construction, operation, decommissioning, immediate, delayed, rate of change);
* **Duration** (short term, long term, intermittent, continuous);
* **Reversibility/irreversibility**;
* **Likelihood** (probability, uncertainty or confidence in the prediction); and
* **Significance** (local, regional, global).

**Nature**

The most obvious impacts are those that are directly related to the proposal, and can be connected (in space and time) to the action that caused them. Typical examples of direct impacts are: loss of wetlands caused by agricultural drainage; destruction of habitat caused by forest clearance; relocation of households caused by reservoir impoundment; increased air particulate emissions caused by operation of a new power station, etc. Indirect or secondary impacts are changes that are usually less obvious, occurring later in time or further away from the impact source. Examples of these types of impacts are: the spread of malaria as a result of drainage schemes that increase standing water and thereby create new vector habitat; bio-accumulation and bio-magnification of contaminants in the food chain through take up of agricultural pesticides; and anxiety, stress and community disruption associated with increased traffic volumes and noise caused by road development.

Cumulative effects, typically, result from the incremental impact of an action when combined with impacts from projects and actions that have been undertaken recently or will be carried out in the near or foreseeable future. These impacts may be individually minor but collectively significant because of their spatial concentration or frequency in time. Cumulative effects can accumulate either incrementally (or additively) or interactively (synergistically), such that the overall effect is larger than the sum of the parts.

**Magnitude**

Estimating the magnitude of the impact is of primary importance. Typically, it is expressed in terms of relative severity, such as major, moderate or low. Severity, as opposed to size, also takes account of other aspects of impact magnitude, notably whether or not an impact is reversible and the likely rate of recovery.

**Extent/location**

The spatial extent or zone of impact influence can be predicted for site-specific versus regional occurrences. Depending on the type of impact, the variation in magnitude will need to be estimated; for example, alterations to range or pattern of species or dispersion of air and water pollution plumes. This is much easier for direct impacts but can be attempted for other types of impacts.

**Timing**

Impacts arising from all of the stages of the life cycle of the project should be considered (i.e. during construction, operation and decommissioning). Some impacts will occur immediately, while others may be delayed, sometimes by many years. These impact characteristics should be noted in the EIA report.

**Duration**

Some impacts may be short-term, such as the noise arising from the operation of equipment during construction. Others may be long-term, such as the inundation of land during the building of a reservoir. Certain impacts such as blasting may be intermittent, whereas others, such as electromagnetic fields caused by power lines, may be continuous. Impact magnitude and duration classifications can be cross-referenced; for example, major but short term (less than one year), low but persistent (more than 20 years).

**Significance**

The evaluation of significance at this stage of EIA will depend on the characteristics of the predicted impact and its potential importance for decision-making. Significance is usually attributed in terms of an existing standard or criteria of permissible change, for example as specified in a standard, policy objective or plan.

**5.5. Social Impact Assessment**

People are an integral part of the environment. Human activity alters the biophysical environment and, in turn, these impacts are translated into social effects. In many EIA systems the immediate and direct social impacts of a proposal always should be analyzed as an integral component of an EIA. Social impacts include changes that affect individuals, groups, communities and populations as well as the interactions between them. They are alterations in the way people live, work, play, relate to each other and organize their communities and institutions to meet their needs and guide their collective actions, as well as changes in their characteristic values, beliefs, norms, traditions and perceptions of quality of life and wellbeing.

Social impacts can be divided into four main types:

* ***Demographic Impacts*** such as changes in population numbers and characteristics (such as sex ratio, age structure, in-and-out migration rates and resultant demand for social services, hospital beds, school places, housing etc);
* ***Cultural Impacts*** including changes to shared customs, traditions and value systems (e.g. language, dress, religious beliefs and rituals) archaeological, historical and cultural artifacts and to structures and environmental features with religious or ritual significance;
* ***Community Impacts*** including changes in social structures, organizations and relationships and their accompanying effect on cohesion, stability, identity and provision of services; and
* ***Socio-psychological Impacts*** including changes to individual quality of life and wellbeing, sense of security or belonging and perceptions of amenity or hazard.

Often, local people are not the beneficiaries of proposed development. Rather they bear the brunt of the adverse impacts. These effects are especially acute in developing countries when projects displace people whose security and subsistence depends on the land and resources that will be affected. World Bank environmental and social assessment procedures give particular attention to the impact on indigenous peoples and other vulnerable ethnic and cultural groups whose lifestyle, value and tenure systems may be disrupted or lost. A comprehensive social impact assessment (SIA) will be required in such cases. In other circumstances, adding a relevant specialist to the EIA team may suffice to address social impacts.

**Health Impacts**

Health impacts can be a significant aspect of certain types of development. These impacts can be beneficial as well as adverse; for example, water infrastructure projects eradicate or drastically reduce the occurrence of cholera, diarrhea and other gastro-intestinal diseases that are endemic in less developed countries. However, adverse health impacts can also occur as a result of development projects, either directly from changes to the biophysical environment (such as exposure to pollutants) or indirectly as a secondary result of other changes; for example, the creation of habitat conditions favorable to the spread or intensification of disease vectors, such as mosquitoes (malaria) or water snails (schistosomiasis).

To date, insufficient attention has been given to health impacts in comparison to coverage given to biophysical or even other social impacts. In many cases, health impact assessment (HIA) is carried out separately and independently; for example in the chemical, nuclear and other hazardous industries. The World Health Organization, the World Bank and other international agencies recommend that, where necessary and appropriate, HIA should be integrated with the EIA process.

**5.6. Evaluation of Impact Significance**

Once the impacts have been analyzed, they are **evaluated to determine their significance**. As noted earlier, the attribution of significance begins early, during screening and scoping, and extends throughout the EIA process. There is a gradually ‘narrowing cone of resolution’ on questions of impact significance as more complete information becomes available. Following impact identification and prediction, impact evaluation is the formal stage at which a test of significance is made.

A systematic process should be followed in evaluating significance, distinguishing between as predicted and residual impacts. Step one involves evaluating the significance of ‘predicted’ impacts to define the requirements for mitigation and other remedial actions (discussed in next unit Mitigation and impact assessment). Step two involves evaluating the significance of the ‘residual’ impacts, i.e. after mitigation measures are taken into account. This test is the critical measure of whether or not a proposal is likely to cause significant impacts. It is determined by the joint consideration of its characteristics (magnitude, extent, duration etc.) and the importance (or value) that is attached to the resource losses, environmental deterioration or alternative uses which are foregone.

Impact evaluation is a difficult and contestable exercise, which cuts across the fluid boundary between facts and values and between EIA and decision-making. First, a technical judgment must be made of the extent to which mitigation will reduce as predicted impacts. Second, a subjective value must be placed on the significance of residual impacts, using criteria and tests described below. Finally, the attribution of significance usually will influence final approval and condition setting; for example by indicating whether or not the impact of a proposal is acceptable or not.

Evaluation of significance should take place against a framework of criteria and measures established for the purpose. These may be defined in EIA legislation and procedure; for example, by definition of what constitutes an environmental impact and guidance on how to determine significance. Often specified criteria are listed to aid such evaluation; for example, environmental standards and thresholds, protected and sensitive areas, valued ecological functions and components and resource and land use capabilities. Where this EIA guidance is not available, it can be developed separately by adapting criteria and measures that are relevant to local circumstances and the type of proposals reviewed.

**Significance Criteria**

A test of significance can be applied by asking three questions:

* Are there residual environmental impacts?
* If yes, are these likely to be significant or not?
* If yes, are these significant effects likely to occur? (e.g. is the probability of occurrence high, moderate or low?

Criteria to evaluate whether or not adverse impacts are significant include:

* environmental loss and deterioration;
* social impacts resulting directly or indirectly from environmental change;
* non-conformity with environmental standards, objectives and guidelines; and
* likelihood and acceptability of risk

**Criteria to evaluate adverse impacts on natural resources, ecological functions or designated areas include:**

* reductions in species diversity;
* depletion or fragmentation on plant and animal habitat;
* loss of threatened, rare or endangered species;
* impairment of ecological integrity, resilience or health e.g. disruption of food chains; decline in species population; alterations in predator-prey relationships

**Criteria to evaluate the significance of adverse social impacts that result from biophysical changes include:**

* threats to human health and safety e.g. from release of persistent and/or toxic chemicals;
* decline in commercially valuable or locally important species or resources e.g. fish, forests and farmland;
* loss of areas or environmental components with cultural, recreational or aesthetic value;
* displacement of people e.g. by dams and reservoirs;
* disruption of communities by influx of a workforce e.g. during project construction; and
* pressures on services, transportation and infrastructure

**Environmental standards, objectives and targets to evaluate significance include:**

* prescribed limits on waste/emission discharges and/or concentrations;
* ambient air and water quality standards established by law or regulations;
* environmental objectives and targets contained in policy and strategy; and
* plans that protect areas or allocate or regulate the use of land and natural resources

**UNIT 6-Mitigation and Impact Management**

**6.1. Link between EIA Process and Mitigation**

Mitigation is a critical component of the EIA process. It aims to prevent adverse impacts from happening and to keep those that do occur within an acceptable level. Opportunities for impact mitigation will occur throughout the project cycle.

The objectives of mitigation are to:

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

Early links should be established between the EIA and project design teams to identify mitigation opportunities and incorporate them into consideration of alternatives and design options. In practice, mitigation is emphasized in the EIA process once the extent of the potential impact of a proposal is reasonably well understood. This typically takes place following impact identification and prediction, and recommended measures for mitigation will be an important part of the EIA report. Usually, these measures will be incorporated into the terms and conditions of project approval and implemented during the impact management stage of the EIA process.

The objectives of impact management are to:

* ensure that mitigation measures are implemented;
* establish systems and procedures for this purpose;
* monitor the effectiveness of mitigation measures; and
* take any necessary action when unforeseen impacts occur

The adverse impacts and consequences of a proposal can occur far beyond the site boundaries of a project. In the past, many of the real costs of development proposals were not accounted for in economic analyses of project feasibility, particularly in the operational and decommissioning phases of the project cycle. As a result, these costs were borne by the community affected or the public at large rather than by the proponent.

Stricter requirements are now being imposed on proponents to:

* mitigate impacts through good project design and environmental management;
* provide benefits to the community affected by the proposal;
* prepare plans for managing impacts so these are kept within acceptable levels; and
* make good any residual environmental damage

The responsibility of proponents to internalize the full environmental costs of development proposals is now widely accepted. In addition, many proponents have found that good design and impact management can result in significant savings. This outcome is similar to that found in industries applying the principles of cleaner production to improve their environmental performance. Like cleaner production, mitigation measures are more expensive in capital outlay but have been found to be cost effective over the long run.

**6.2. Elements of Mitigation**

The main elements of mitigation are organized into a hierarchy of actions:

* first, avoid adverse impacts as far as possible by use of preventative measures;
* second, minimize or reduce adverse impacts to as low as practicable levels; and
* third, remedy or compensate for adverse residual impacts, which are unavoidable and cannot be reduced further

**Key principles** for the application of mitigation consistent with the above framework include:

* give preference to avoid and prevent measures;
* consider feasible alternatives to the proposal and identify the best practicable environmental option;
* identify customized measures to minimize each of the main impacts predicted;
* ensure they are appropriate, environmentally sound and cost-effective; and
* use compensation or remedial measures as a last resort

Mitigation can be carried out by:

* ***Structural measures***- such as design or location changes, engineering modifications and landscape or site treatment; and
* ***Non-structural measures*** - such as economic incentives, legal, institutional and policy instruments, provision of community services and training and capacity building.

Structural measures are well established for certain types of projects, such as dams, roads, and oil and gas exploration and development. In some cases, industry codes of good practice will be available. However, these need to be applied with regard to the nature and severity of environmental impacts; for example taking account of nearby protected areas, patterns of wildlife mitigation or constraints imposed by natural hazards. Other projects involving new technology may require non-standardized or even untried measures to mitigate the adverse impacts. These need to be given special attention during impact management.

Non-structural measures are used increasingly. They can be applied to reinforce or supplement structural measures or to address specific impacts. For example, many types of social, community and health impacts are addressed by non-structural measures and their use is becoming broader.

A three-step process of mitigation can be applied to relate the hierarchy of elements to the stages of the EIA process when they are typically applied. Generally, as project design becomes more detailed, the opportunities for impact avoidance narrow and the concern are to minimize & compensate for unavoidable impacts. However, these distinctions are not rigid & opportunities for creative mitigation should be sought at all stages of EIA & project planning.

***Step One: Impact Avoidance -*** This step is most effective when applied at an early stage of project planning. It can be achieved by:

* not undertaking certain projects or elements that could result in adverse impacts;
* avoiding areas that are environmentally sensitive; and
* putting in place preventative measures to stop adverse impacts from occurring, for example, release of water from a reservoir to maintain a fisheries regime

***Step Two: Impact Minimization-*** This step is usually taken during impact identification and prediction to limit or reduce the degree, extent, magnitude, or duration of adverse impacts. It can be achieved by:

* scaling down or relocating the proposal;
* redesigning elements of the project; and
* taking supplementary measures to manage the impacts

***Step Three: Impact Compensation*** *-* This step is usually applied to remedy unavoidable residual adverse impacts. It can be achieved by:

* rehabilitation of the affected site or environment, for example, by habitat enhancement and restocking fish;
* restoration of the affected site or environment to its previous state or better, as typically required for mine sites, forestry roads and seismic lines; and
* replacement of the same resource values at another location, for example, by wetland engineering to provide an equivalent area to that lost to drainage or infill

**6.3. Approaches to Mitigation**

Depending on the timing of the project cycle and the nature of impacts, a number of approaches can be taken to achieve the objectives of mitigation. These include:

1. developing environmentally better alternatives to the proposal;
2. making changes to project planning and design;
3. carrying out impact monitoring and management; and
4. compensating for impacts by: monetary payment; site remediation bonds; a resettlement plan or in kind measures
	* 1. **Developing Better Alternatives**

The development of alternatives to a proposed project is part of a comprehensive approach to mitigation. A broad range of alternatives can be generated at the earliest stages of project planning and design. At the later stages of project design, it is more realistic to identify feasible alternatives to the proposal. For example, impacts may be avoided or reduced by a reconsideration of the site or design alternatives and identifying the best practicable environmental option.

* + 1. **Making Changes to Project Planning and Design**

Early consideration of environmental factors and impacts in project planning and design facilitates impact avoidance and minimization. This requires coordination of the engineering, planning and EIA teams to:

* address the likely impacts throughout the life cycle of the project, including decommissioning; and
* identify the best practicable ways and means of mitigating them.
	+ 1. **Carrying out Impact Monitoring and Management**

Mitigation measures are implemented as part of impact management. This process is accompanied by monitoring to check that impacts are as predicted. When unforeseen impacts or problems occur, they can require corrective action to keep them within acceptable levels, thereby changing the mitigation measures recommended in an EIA or set out in an environmental management report.

The management of social impacts associated with influx of a temporary workforce and additional population require specific mitigation measures. These include the provision of:

* improved transport, water and sewage infrastructure;
* expanded social and health care services, including measures to target specific impacts;
* better support and counseling services to cope with socio-economic changes; and
* additional recreational areas and facilities, including full replacement of any areas lost to development.
	+ 1. **Compensating for Impacts**: this includes:
1. **Monetary Compensation**

Traditionally, compensation has meant payment for loss of land or amenity resulting from a proposal. This approach can be appropriate in certain circumstances; for example, when private property must be expropriated to make way for a road or other public infrastructure project, or land owners is paid rent or lump sum compensation for access to or use of their property to drill for sub-surface resources. In addition, compensation packages, containing a range of offsets, may be negotiated with affected communities. These may include a direct monetary payment or a capital investment by the proponent.

1. **Site Remediation Bonds**

Recently, attention has also focused on problems of contaminated land and the requirements for site. Where this is a potential issue, mitigation measures should be directed at both prevention of contamination and provision for clean up during decommissioning. Because of the time period, project ownership may change or the proponent may be unable to complete the mitigation plan for other reasons. As insurance, a bond system can be used to ensure that sufficient funds will be available for the required mitigation.

1. **Resettlement Plans**

Special considerations apply to mitigation of proposals that displace or disrupt people. Certain types of projects, such as reservoirs and irrigation schemes and public works, are known to cause involuntary resettlement. This is a contentious issue because it involves far more than re-housing people; in addition, income sources and access to common property resources are likely to be lost. Almost certainly, a resettlement plan will be required to ensure that no one is worse off than before, which may not be possible for indigenous people whose culture and lifestyle is tied to a locality. This plan must include the means for those displaced to reconstruct their economies and communities and should include an EIA of the receiving areas. Particular attention should be given to indigenous, minority and vulnerable groups who are most at risk from resettlement.

1. **In kind Compensation**

When significant or net residual loss or damage to the environment is likely, in kind compensation is appropriate. As noted earlier, environmental rehabilitation, restoration or replacement have become standard practices for many proponents. Now, increasing emphasis is given to a broader range of compensation measures to offset impacts and assure the sustainability of development proposals. These include impact compensation trading, such as offsetting CO2 emissions by planting forests to sequester carbon.

**6.4. Environmental Management Plan and Mitigation Measures**

An EIA report contains predictions about the environmental impacts of proposals and recommendations for their mitigation and management. The report is essentially a discretionary planning document. Usually, a separate project approval sets the terms and conditions with which the proponent must comply.

An environmental management plan (EMP), also referred to as an impact management plan, is usually prepared as part of EIA reporting. It translates recommended mitigation and monitoring measures into specific actions that will be carried out by the proponent. Depending upon particular requirements, the plan may be included in, or appended to, the EIA report or may be a separate document. The EMP will need to be adjusted to the terms and conditions specified in any project approval. It will then form the basis for impact management during project construction and operation.

The main components of an EMP are described in the table below, which reflects practice at the World Bank. There is no standard format, but the EMP should contain the following:

* summary of the potential impacts of the proposal;
* description of the recommended mitigation measures;
* statement of their compliance with relevant standards;
* allocation of resources and responsibilities for plan implementation;
* schedule of the actions to be taken;
* program for surveillance, monitoring and auditing; and
* Contingency plan when impacts are greater than expected.

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| --- |
| **Components of an Environmental Management Plan (EMP)** |
| **EMP Component** | **How to address** |
| Summary of impacts | The predicted adverse environmental and social impacts for which mitigation is required should be identified and briefly summarized.  |
| Description of mitigation measures | Each mitigation measure should be briefly described with reference to the impact to which it relates and the conditions under which it is required (for example, continuously or in the event of contingencies). These should be accompanied by, or referenced to, project design and operating procedures which elaborate on the technical aspects of implementing the various measures. |
| Description of monitoring program | The monitoring program should clearly indicate the linkages between impacts identified in the EIA report, measurement indicators, and definition of thresholds that will signal the need for corrective actions. |
| Institutional arrangements | Responsibilities for mitigation and monitoring should be clearly defined, including arrangements for co-ordination between the various actors responsible for mitigation. |
| Implementation schedule and reporting procedures | The timing, frequency and duration of mitigation measure should be specified in an implementation schedule, showing links with overall project implementation. Procedures to provide information on the progress and results of mitigation and monitoring measures should also be clearly specified. |
| Cost estimates and sources of funds | These should be specified for both the initial investment and recurring expenses for implementing all measures contained in the EMP, integrated into the total project costs. |

**UNIT 7- EIA Reporting**

**7.1. What is an EIA Report?**

A number of different names are used for the report that is prepared on the findings of the EIA process. The generic term EIA report is used here. Other terms commonly used for the same document include environmental impact statement (EIS) and environmental statement (ES). Further variations may be introduced by the terminology used in different countries. Despite the different names, EIA reports have the same basic purpose, approach and structure.

Usually, the proponent is responsible for the preparation of the EIA report. The information contained in the report should meet the terms of reference established at the scoping stage of the EIA process (see Scoping section of course). The terms of reference set out the information that is to be submitted to the decision-making body or responsible authority.

The purpose of the EIA report is to provide a coherent statement of the potential impacts of a proposal and the measures that can be taken to reduce and remedy them. It contains essential information for:

* the proponent to implement the proposal in an environmentally and socially responsible way;
* the responsible authority to make an informed decision on the proposal, including the terms and conditions that must be attached to an approval or authorization; and
* the public to understand the proposal and its likely impacts on people and the environment.

A successful EIA report that meets these aims will be:

* **Actionable** - a document that can be applied by the proponent to achieve environmentally sound planning and design;
* **Decision-relevant** - a document that organizes and presents the information necessary for project authorization and, if applicable, permitting and licensing; and
* **User-friendly** - a document that communicates the technical issues to all parties in a clear and comprehensible way.

**7.2. Typical Elements of EIA Report**

In many countries, the information to be included in an EIA report is specified in legislation, procedure or guidance. Alternatively, the format may be established by custom or reference to the World Bank sample outline of an EIA report. Typically, the content of an EIA report will be prepared in accordance with specific terms of reference established during the scoping process. It may also include additional issues and other matters that have emerged as a result of EIA studies and need to be taken into account in decision-making.

An EIA report typically includes most or all of the following headings and items:

* + 1. **Executive or non-technical summary**

The executive summary gives a concise description of the main findings and recommendations. It is not meant to summarize all of the contents of the EIA report. Instead the focus is on the key information and options for decision-making. Except for very large proposals, the executive summary should be kept short, no more than seven pages and preferably less. Often, the executive summary is the only part of the report that decision makers and most people will read. It can be written for distribution to the public as an information brochure. An executive summary should describe:

* the proposal and its setting;
* the terms of reference for the EIA;
* the results of public consultation;
* the alternatives considered;
* major impacts and their significance;
* proposed mitigation measures;
* the environmental management plan; and
* any other critical matters that bear on the decision.
	+ 1. **Need and objectives of the proposal**

A clear statement of the need for and objectives of the proposal should be given. Typically, need is substantiated by reference to relevant policies and plans. Reference also can be made to the demands and issues that the proposal is intended to address, the purpose that will be achieved, and the benefits that are anticipated.

* + 1. **Legal and policy framework**

There is usually a brief description of the legal and policy framework that applies to the proposal being assessed. Relevant aspects of EIA procedure can be cited, together with any other requirements or considerations that need to be mentioned. The Terms of Reference for the EIA should be summarized, explaining the reasons for any variation with them. A copy of the complete Terms of Reference should be appended where appropriate.

* + 1. **Description of the proposal and its alternatives**

A description of the proposal and the alternatives indicates the elements and main activities that will take place during project construction, operation and decommissioning. This section of the report draws attention to the major differences between the alternatives, including the no-action alternative. It can also include information on:

* the project setting and the major on-site and off-site features (e.g. access roads, power and water supply, etc.);
* resource use, raw material inputs and emission and waste discharges;
* operational characteristics, processes and products;
* the relationship of the technical, economic, social and environmental features of the proposal; and
* comparison of alternatives and options (such as size, location, technology, layout, energy sources, source of raw materials) within the above context.
	+ 1. **Description of the affected environment**

A concise description is needed of the biophysical and socio-economic conditions of the affected environment. Baseline information should include any changes anticipated before the project begins. Current land use and other proposed development activities within the project area should also be taken into account. This indicates how the proposal relates to current policies and plans and whether or not it is consistent with them.

Baseline information is often covered in too much detail in an EIA report. It should provide only the necessary background and baseline against which to understand impact predictions. Key aspects of the affected environment that need to be included for this purpose include:

* spatial and temporal boundaries;
* biophysical, land use and socio-economic conditions;
* major trends and anticipated future conditions should the proposal not go ahead; and
* environmentally-sensitive areas and valued resources that may need special protection
	+ 1. **Public Consultation and Inputs**

A concise, yet complete, statement of the nature, scope and results of public consultation is an important section of the report. These particulars are sometimes overlooked or aspects are insufficiently described. Depending on the provision made for public consultation, some or all of the following points can be included:

* identification of the interested and affected public;
* the method(s) used to inform and involve stakeholders;
* analysis of the views and concerns expressed;
* how these have been taken into account; and
* outstanding issues and matters that need to be resolved
	+ 1. **Environmental impacts and their evaluation**

This section of the EIA report evaluates the potential positive and adverse impacts for both the proposal and its alternatives and for each component of the environment identified as important in the terms of reference. Impact characteristics are described as predictions of magnitude, severity, occurrence, duration, etc. The significance of residual impacts that cannot be mitigated should be explicitly stated. Information contained in this section includes:

* prediction of each major impact, its characteristics and likely consequences;
* consideration of their compliance with environmental standards and policy objectives;
* recommended measures for avoiding, minimizing and remedying the impact;
* evaluation of significance of the residual impacts (stating the standards or criteria used); and
* limitations associated with impact prediction and evaluation, as indicated by the assumptions made, gaps in knowledge and uncertainties encountered.

It is helpful to present information in summary form to give readers an overview of the impact characteristics of the proposal and the alternatives to it. One possible way to do this is to display the information in tables (see below) as suggested in unit six- Impact analysis. Both direct and indirect impacts, including potential cumulative effects, should be highlighted.

|  |
| --- |
|  **Impact Characteristic Summary Table** |
| **IMPACT CHARACTERISTIC** |  **IMPACT TYPE** |
| Social | Health | Economic | Ecological |
| Nature |  |  |  |  |
| Magnitude |  |  |  |  |
| Extent/location |  |  |  |  |
| Timing |  |  |  |  |
| Duration |  |  |  |  |
| Reversibility |  |  |  |  |
| Likelihood (risk) |  |  |  |  |
| Significance |  |  |  |  |

**Comparative evaluation of alternatives and identification of the environmentally preferred option**

In this section, the proposal and the alternatives are systematically compared in terms of adverse and beneficial impacts and effectiveness of mitigation measures. As far as possible, the trade-offs should be clarified and a clear basis for choice established. The environmentally preferred option should be identified and reasons given for the selection made. At this point of the EIA Report the evaluation should include information (especially costs) about the mitigation measures for the main alternatives, so that the evaluation can be conducted on a reasonably consistent basis. This will help to ensure that the best alternative, across all the environmental and social criteria, is selected.

A comparative evaluation can be undertaken by reference to:

* adverse and beneficial impacts;
* effectiveness of mitigation measures;
* distribution of benefits and costs, locally and regionally; and
* any other opportunities for community and environmental enhancement.

As with the identification and evaluation of the impacts the presentation of the comparison of alternatives can follow many forms. Evaluation methods have been developed to bring together the various environmental effects (and impacts) associated with a proposal and its alternatives. The methods enable comparisons of impacts and alternatives to be made. They also lead directly to an output which summarizes all the environmental impacts and provides the basis for the evaluation of the proposal (and alternatives) by decision-makers.

*\* Note the environmental management plan can be included in or annexed to the report; in some cases it may be a separate document.*

**UNIT 8- EIA Review**

**8.1. Purpose of EIA Review**

The purpose of review is to assure the completeness and quality of the information gathered in an EIA. When undertaken as a formal step, it acts as a final check on the quality of the EIA report submitted to obtain a project authorization. Often, this process leads to a requirement for additional information on potential impacts, mitigation measures or other aspects.

Key objectives of EIA review are to:

* assess the adequacy and quality of an EIA report;
* take account of public comment;
* determine if the information is sufficient for a final decision to be made; and
* identify, as necessary, the deficiencies that must be addressed before the report can be submitted.

The elements of EIA review and the aspects considered differ with the arrangements that are in place in a particular country. A comprehensive review of the adequacy and quality of an EIA report would address many or all of the following issues:

* Does the report address the Terms of Reference?
* Is the necessary information provided for each major component of the EIA report?
* Is the information correct and technically sound?
* Have the views and concerns of affected and interested parties been taken into account?
* Is the statement of the key findings complete and satisfactory, e.g. for significant impacts, proposed mitigation measures, etc.?
* Is the information clearly presented and understandable by decision makers and the public?
* Is the information relevant and sufficient for the purpose of decision making and condition setting? The response to the last question is the most significant aspect for review conclusions, and will largely determine whether or not an EIA can be submitted as is or with minor revisions.

Most EIA systems provide for review of the EIA report. However, the procedures established for this purpose differ considerably, possibly more than for other process elements. The conduct of EIA reviews is based on both informal and formal arrangements. Marked variations exist in their particular requirements, forms of public consultation and the roles and responsibilities of lead agencies.

Specific procedures for EIA review that are in place in different countries are shown below. In general, these can be divided into two main types:

* ***Internal Review*** - undertaken by the responsible authority or other government agency, with or without formal guidelines and procedure; and
* ***External Review*** - undertaken by an independent body, separate from and/or outside government agencies, with an open and transparent procedure for public comment.

In many cases, internal review is informal and characterized by:

* relatively low operating costs;
* discretionary guidance on the conduct of review;
* lack of transparency on process and factors considered; and
* absence of documentation on outcomes and results, e.g. advice tendered to decision-makers.

External review procedures are more formal and characterized by:

* higher levels of quality assurance;
* independence from the responsible authority (to varying degrees);
* transparent and rigorous process;
* use of guidelines and/or review criteria and methodology;
* documented outcome or statement on the sufficiency or deficiency of an EIA report; and
* Separate commission, panel, inter-agency or expert committee or other review body.

**Public Consultation**

Public input is an integral means of reinforcing objectivity and assuring the quality of information presented. Many EIA systems provide an opportunity for public review and comment on the information contained in an EIA report. At a minimum, this requires reasonable time and opportunity for interested parties to comment. ፍ

Certain countries make provision for a more extended, open review process, using public hearings and other means to gain the views of interested and affected parties on the EIA report. These are usually applied only to large scale and controversial proposals. In other cases less intensive forms of consultation and comment are appropriate. However, in all cases, it is important that these are tailored to the people who are involved.

**8.2. Main Steps in EIA Review**

There are a number of steps can help to achieve good practice in the review of EIA reports. First you need to establish a framework for the EIA review, including the following steps (and will be covered in more detail on this page):

* set the scale/depth of the review;
* select reviewer(s);
* use input from public involvement; and
* identify review criteria and aspects to be considered

Once you have established this framework for review, you will then need to undertake and report the review, which involves the following steps;

* carrying out the review;
* determine how to remedy any deficiencies; and
* report the findings.

**Setting the scale**

Two questions should be addressed at the start of a review:

* How much time is available to carry out the review?
* Are the necessary resources available for this purpose?

The answers to these questions will depend mainly on the provision made for review within the EIA system and the Terms of Reference. The nature of the proposal will determine the speed and intensity of the review. More controversial projects, or those with more significant effects, typically require more detailed review. The choice ranges from a quick overview by one person to an in-depth review by a team of experts assembled to do the job.

**Selecting reviewer(s)**

The environmental issues and the technical aspects of the proposal will determine the expertise required by a review team or individual. For example, the review of an EIA report for a proposal for a solid waste disposal site might include a landfill engineer, a hydro-geologist and an environmental remediation specialist. Depending on the scale of review, administrative support and technical backup may be necessary.

**Using input from public comment**

Experience with EIA review in a number of countries has shown that public comment is a critical ingredient of good practice. The input from the public has proved to be important in checking and evaluating the quality of the EIA report; for example, with regard to the description of the affected environment and community, the attribution of significance of residual impacts, the effectiveness of mitigation measures and the selection of an alternative.

Input may come from a public hearing, or from written comments submitted to the proponent or government department. From a hearing there will often be a summary of issues provided by the panel or officers responsible for hearing the submissions. With written comments a summary of key points will be needed to guide the review of the EIA. In both cases the summary should focus on information that helps to identify problems with the EIA, contributing to the assessment of impacts, and identifying ways to reduce impacts.

While it is useful to gauge the strength of public concern about particular issues (such as support for an alternative) the consultation process should not be seen as an opportunity for people to vote on any one issue.

**Identifying the review criteria**

A systematic review will be based on specified criteria. These criteria can be identified by reference to the following questions:

***i. Are terms of reference or other guidelines available for the review?***

If not, the first task of the review is to quickly re-scope the main issues and impacts to be addressed in the EIA report. This can be done with the help of scoping methods.

***ii. Are any reviews of EIA reports of comparable proposals in similar settings available?***

EIA reports and reviews of comparable proposals in similar settings provide useful points of reference to check the type of impacts that are considered significant and the information that is necessary for decision-making. These can be from the country concerned or elsewhere. It is particularly useful to learn about problems experienced during the implementation and operation of the projects. These can give insights to the nature of impacts that are likely to occur during implementation and operation.

***iii. Which generic review criteria may be useful?***

Generic criteria that may help to carry out an EIA review include:

* legal EIA requirements (if any);
* relevant environmental standards, guidelines or criteria;
* principles of EIA good practice; and
* knowledge of the project and its typical impacts and their mitigation.

***iv. When is a comprehensive review appropriate?***

A comprehensive review of the quality of an EIA report may be necessary in certain circumstances, for example when there are serious deficiencies in the information assembled. This involves a review of the conduct of the EIA process. Some or all of the elements and aspects that may require consideration include:

* performance of scoping;
* accuracy of impact prediction;
* criteria used to evaluate significance;
* comparison of alternatives;
* effectiveness of proposed mitigation measures;
* requirements for monitoring and impact management; and
* modes of public and stakeholder involvement.

In other cases, particular attention could be directed to the executive summary, which is intended to explain the key findings concisely and in a non-technical manner. This is the only part of the EIA report that decision-makers and the public are likely to read. A review can indicate if the information contained in the main body of the report has been communicated simply and accurately.

# 8.3. Undertaking Review

The review can be carried out in three steps:

* Step 1: identifies the deficiencies in the EIA report, using the Terms of Reference, relevant guidelines and criteria and information from any comparable EIA reports and their reviews.
* Step 2: focuses on any shortcomings in the EIA report and separate crucial deficiencies, which may directly impede decision-making, from less important ones. If no serious omissions are found, this should be stated clearly. Remarks about less important deficiencies can be placed in an appendix.
* Step 3: recommends how, and when, any serious shortcomings are to be remedied to facilitate informed decision-making and appropriate measures for project implementation.

**Determining remedial options**

Three remedial options are available when an EIA report fails to meet the standards required. These are scaled to the nature and scope of the inadequacies.

1. *The shortcomings of the EIA report are so serious that they require immediate remedy, either a supplementary or a new EIA report –* In this situation, the review should give a clear statement as to how the additional information can be collected and presented. The review team must realize that the decision-making will be delayed by some time until a new report or supplement to the EIA report is completed.
2. *The shortcomings are not serious and can be rectified by explanatory material attached to the report or conditions attached to the approval –* This situation has the advantage that decision-making can proceed as planned without a major delay necessitated by gathering additional environmental data.
3. *The shortcomings are not major but cannot be remedied immediately, either by providing additional information to the EIA, or in the form of explanations and conditions attached to the decision, because they require too much time and effort to collect –* In this case, the review could recommend monitoring the shortcomings and uncertainties during the implementation and operation of the project. Corrective measures should be identified in case impacts turn out to be worse than expected.

**EIA review and the acceptability of the proposal**

In some EIA systems, the review stage concerns only the quality and adequacy of the environmental information in the EIA report. Step three as described above concludes the review. Either a statement of sufficiency or deficiency is issued, and in the latter case, serious shortcomings are identified and options to remedy them are described.

A number of countries have review procedures that tender advice on the implications of the findings for decision-making, or make a recommendation on whether or not the proposal should be approved or can be justified on environmental grounds.

In this case, an additional step is added to those mentioned above:

* Step 4: Give either a green (go) or red (stop) or yellow light (conditional acceptance) for the environmental aspects.

This step builds on the previous three steps. It does not address the final decision of whether or not the proposal is acceptable or should be approved. That requires a political decision, taking into account the trade-offs among environmental, economic and social factors.

**UNIT 9- Decision Making**

# 9.1. EIA as part of Decision Making

EIA is part of a larger process of decision-making to approve a major proposal. This process is shown in the figure below. It results in a political decision, which is based on information from a number of different sources & involves making a large number of trade-offs. A balance must occur between benefits & costs; their environmental, economic & social elements must be weighed, & uncertainties & arguments over significance of risks & impacts must be addressed.



The factors that will be important in the final approval of a proposal include:

* findings of significant impact contained in the EIA report;
* inputs from economic and social appraisals; and
* other external pressures or political inputs to decision-making.

**Taking account of the EIA report**

The information provided by EIA is based on technical analysis and public involvement. It is a synthesis of facts and values. How these components are reconciled and documented in the EIA report can have an important bearing on the potential contribution it makes to decision-making. The usefulness of the EIA report for decision-making also depends upon the use of good practice at previous stages in the EIA process.

In many jurisdictions the information of the EIA report and from other sources, like public submissions, is presented to decision-makers in a summary form. Decision-makers then have the use of:

* the EIA Report (often called an Environment Impact Statement); and
* the summary report (called an Assessment Report or similar).

This summary report is likely to be compiled by the government representative responsible for the EIA procedures in the jurisdiction (such as the responsible government minister). It will provide an overall recommendation about the project environmental impacts and about mitigation and ongoing management measures.

Decision-makers then have the advice about the environmental impacts that comes from the review of the EIA (the Assessment Report) and other sources of information available to the EIA minister, and the specific information contained in the EIA report.

At a minimum, decision makers are expected to take account of the information from the EIA process in final approval and condition setting. With few exceptions, an EIA process does not lead to the rejection of a proposal even when there are findings of potentially significant impacts (although retaining this option is important for process credibility). However, the results of the EIA process usually have a considerable bearing on establishing terms and conditions for project implementation.

When making decisions, those responsible seldom have time to read the EIA report, other than an executive summary. Typically, they rely upon the advice of their officials, whose views are likely to be shaped by their policy mandates and responsibilities. The general receptivity of decision-makers to the findings of an EIA report will reflect their confidence in the EIA process and its perceived acceptance by other parties. In this regard, public trust in the EIA process, which is built up over time, may carry particular weight.

**Relating EIA to other inputs**

As the above figure shows, EIA is undertaken together with economic appraisal, engineering feasibility and other studies. Because of these other inputs, the decision that is made may not be the environmentally optimal choice. The environmental consequences of the proposal must be balanced against economic, social and other considerations. These trade-offs form the crux of decision-making, and, typically, environmental considerations carry less weight than economic factors in the approval of development proposals. In this regard, an important question, on which opinion varies, is whether EIA should be a strictly neutral or an advocacy process that argues the case for the environment. The predominant view is that the role of the EIA practitioner is to:

* provide a clear, objective statement of the environmental impacts and their mitigation;
* bring the feasible alternatives and the environmentally preferred option to the attention of decision-makers; and, more arguably
* give contestable advice on the environmental acceptability of the proposal (for example, whether it can be justified in the circumstances).

**Other inputs**

External inputs to the final decision on a proposal often occur through a wider representation of views and interests. These pressures vary from country to country and project to project. Many large-scale proposals are controversial and encompass a broad range of issues on which opinion can be sharply divided. They can become symbols of needed development or of environmental destruction or social injustice.

A summary of *Information considered important for decision-makers* is given in the table below. It lists the key aspects of EIA reports which decision-makers need to take into account when making final approvals and setting conditions for project implementation. This listing is generic and should be reviewed to establish the aspects that are important locally.

|  |
| --- |
| **Information considered important for decision-makers** |
| **Decision-making stage** | **Important information** |
| Background  | Project background and the most important environmental issues involved |
| Policy Context | Basic development issue or problem being addressed (e.g. flooding, water shortage, etc) |
| The relationship to environmental policies and plans |
| Alternatives | Alternatives to the proposal (including the best practicable environmental option (BPEO) or equivalent designation) |
| Public involvementImpact analysis | Key public views |
| Concerns of affected communities |
| Areas of agreement and disagreement |
| Costs and benefits |
| Distribution of gains and losses |
| Mitigation and monitoring  | Adequacy of proposal measures |
| Conclusion and recommendations | Main economic benefits, significant environmental effects and proposed mitigation measures |
| The extent to which the proposal conforms to the principles of sustainable development |
| Design and operational changes to improve the environmental acceptability of the project |

*Adapted from OECD/DAC (1994)*

# 9.2. Role and Responsibilities of Decision Maker

# 9.2.1. Roles of Decision Maker

Inevitably there will be several decision-makers involved in complex, or even relatively simple, projects. The number and type of decision-makers will depend on the EIA procedures and legislation operating in the country of the project, and if there are organizations outside the country involved. For example, the construction of an electricity generating facility using funds loaned by an international financial organization is likely to have the following decision-makers:

* the international financial organization to ensure that the project complies with its own EIA requirements, that environmental impacts will be acceptable, so that any adverse criticism about the project will not reflect badly on the organization;
* the government, or government representatives, such as ministers, who are responsible for granting permission such as permission to conduct land clearing, import foreign capital, or relocate people living on the site;
* the chief executive officer, or manager of the business proposing to construct the generation facility.

In addition, there may be other government officials who are required to grant permission for aspects of the project such as planning permission.

It is important for decision-makers to be aware of their responsibility to implement the EIA process and use its results to better manage the environmental impacts and risks of a proposal. At a minimum, decision-makers need to understand:

* the basic concept and purpose of EIA;
* EIA requirements, principles and guidelines that are applicable;
* the effectiveness of their implementation and the implications for decision-making;
* how EIA process and practice measure up to internationally accepted standards and to those in place in comparable countries; and
* the issues associated with public consultation in decision-making, including third party and legal challenges to the authorization of proposals subject to EIA.

The sustainability agenda places further obligations on decision-makers. In order to meet them, decision-makers need to have the necessary knowledge and tools to take fuller advantage of EIA as a sustainability instrument.

Decision-makers should be encouraged to:

* implement the sustainability commitments made at Rio;
* broaden their perspectives of the environment and its values;
* better communicate information and reasons for decisions;
* apply the precautionary principle when addressing the environmental impacts of development proposals;
* look for improved ways of making trade-offs among environmental, economic and social factors;
* adopt more open and participatory approaches to decision-making; and
* use strategic tools to aid decision-making, for proposed policies and plans and environmental accounting to gain a realistic measure of macro-economic progress.

The discussion should review the chain of decisions culminating in a final approval of the proposal, including:

* **screening** - to decide if and at what level EIA should be applied;
* **scoping** - to identify the important issues and prepare terms of reference;
* **impact** **analysis** -focusing attention on the consideration and choice of alternatives;
* **mitigation** - to identify measures to avoid, minimize or compensate for impacts; and
* **review** - to determine the quality and adequacy of the EIA report as a basis for approval of the proposal.

At each stage, an implicit or explicit decision will be made on whether or not the proposal is acceptable and can be justified environmentally. In practice, this is invariably favorable, unless a proposal has a fatal flaw or proves highly controversial and unacceptable to a large majority of people. This process of decision-making is repetitive, whereby the conclusions reached at each stage narrow down the choices to be made at the next one. It raises a number of issues about the difference EIA information actually makes to interim decision-making and final approval of proposals.

What aspects and issues apply to EIA decision-making locally? For example, consider:

* What type of precedent is set by each stage of decision-making for the next one?
* How do the range of options and considerations become narrowed?
* To what extent does momentum build up in favour of approval as the decision-making process continues?
* What are the circumstances and conditions under which a proposal might not be approved?
* Are the conditions established by the approval and authorization of a proposal enforced during the implementation phase?

**9.2.2. Responsibility of Decision Makers**

The responsibility of decision-makers to consider the findings and recommendations of an EIA report varies from one jurisdiction to another. Normally, there are limited qualifications placed on the discretion of the decision-maker to approve or reject a proposal. Depending on the arrangements in place, the decision-maker may have to:

* meet no further requirements;
* take account of information in the EIA report;
* provide written reasons for the decision; or
* act in accordance with recommendations of an EIA review body, unless these are explicitly overturned.

There can be a number of different outcomes from decision-making:

* the proposal can be approved;
* the proposal can be approved with conditions;
* the proposal can be placed on hold pending further investigation;
* the proposal can be returned for revision and resubmission; and
* the proposal can be rejected outright.

A number of checks and balances are built into EIA processes to help ensure accountability and transparency. The procedural controls are important for quality assurance of the information contained in an EIA report. Unless these are in place, the decision-maker may not be in a position to make an informed choice. In addition, leading EIA systems have established conventions and rules for decision-making, which provide a further check on accountability. Some or all of the following rules and conventions for decision-making have been adopted by leading EIA systems (Wood 1995):

* no decision will be taken until the EIA report has been received and considered;
* the findings of the EIA report and review are a major determinant of approval and condition setting;
* public comment on the EIA report is taken into account in decision-making;
* approvals can be refused or withheld, conditions imposed, or modifications demanded at the final decision stage;
* the decision is made by a body other than the proponent;
* reasons for the decision and the conditions attached to it are published, and
* there is a public right of appeal against the decision (where procedures have not been followed or they have been applied unfairly).

The requirement for written reasons for the decision is particularly important. For instance, the US Record of Decision must contain:

* a statement explaining the decision;
* an explanation of alternatives considered and which of these are environmentally preferable;
* the social, economic and environmental factors considered by the agency in making its decision;
* an explanation of the mitigation measures adopted and, if practicable, the mitigation methods that were not adopted, with an explanation of why not; and
* a summary of the monitoring and enforcement program which must be adopted to ensure that any mitigation measures are implemented.

Normally, all proposals that are subject to EIA will have conditions attached to their implementation as part of the final approval. The conditions that are set may follow the mitigation and impact management measures proposed in the EIA report or vary them, for example by establishing more stringent requirements. In either case, condition setting is based on impact predictions, which have varying levels of reliability. As far as possible, the level of confidence or range of uncertainty that is attached to the information should be specified so decision-makers understand the limitations on condition setting.