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## **Topic 1**

# **Introduction and overview of EIA**

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**Introduction**

**Checklist**

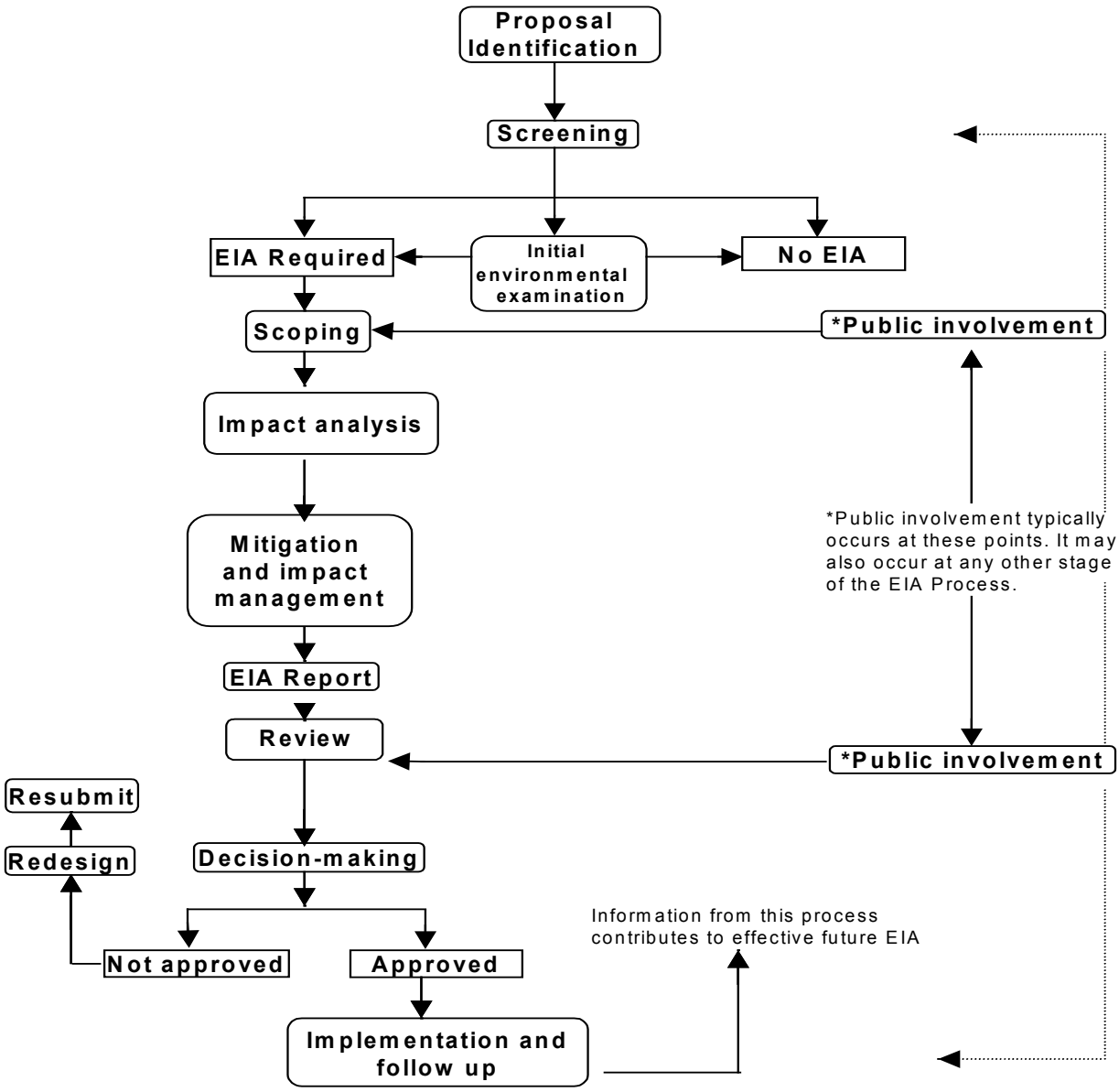
**Session outline**

**Reference list and further reading**

**Training activities**

**Support materials**

# Generalised EIA Process Flowchart



# Topic 1–Introduction and overview of EIA

## Objectives

To introduce the concept of EIA, placing it within the framework of sustainable development.

To outline the history of EIA, why it was introduced and how it has evolved.

To describe the purpose, principles and process of EIA.

To review some contemporary issues of EIA practice.

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## Relevance

Worldwide, the EIA process is based upon commonly accepted definitions, concepts, principles and elements of approach. It is important that all those involved in the EIA process understand these foundations and how they promote integrated environment and development decision-making in support of sustainable development.

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## Timing

Two hours (not including training activity).

***Important note to trainers***

*You should design your presentation with the needs and background of participants in mind, and concentrate on those sections most relevant to your audience. The session presentation timings are indicative only.*

*Time taken for the training activities can vary enormously depending on the depth of treatment, the existing skills and knowledge of participants and the size of the group.*

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**Information checklist**

Obtain or develop the following, as appropriate:

- examples of environmental problems facing the country/region;
- a brief history of the use of EIA in the country/region;
- a flowchart that represents the EIA process in the country/region (if no EIA system is in place look for materials from donor agencies and nearby countries as well as information about any proposed EIA system [draft procedures etc]);
- examples of the results and benefits gained by any local proposals or programmes that have undergone EIA;
- examples of EIA capacity building;
- contact list of people, agencies, organizations and data resource centres, which provide information, expertise and assistance relevant to EIA; and
- other resources that may be available such as videos, journal articles, computer programmes, lists of speakers, case studies etc.

## Session outline

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Welcome participants to the session by introducing yourself and getting them to introduce themselves. Outline the overall coverage of the session, its objectives, and why these are important.

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This topic introduces the concept of EIA and outlines its history, placing it within the current framework of sustainable development. Reference is made to:

- the purpose and aims of EIA;
  - the nature and scope of environmental issues and impacts;
  - the principles of EIA administration and practice;
  - the concept of integrated assessment;
  - the key elements of the EIA process;
  - the costs and benefits of undertaking EIA; and
  - the role of capacity building in improving EIA practice.
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Briefly define EIA, describing its character and purpose.

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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. A broad definition of environment is adopted. Whenever necessary, 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
  - promote environmentally sound and sustainable development through the identification of appropriate enhancement and mitigation measures.
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Discuss the meaning of sustainable development and the role that EIA can play as a tool in moving towards sustainability.

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Sustainable development is a key concept that has gained increasing international acceptance during the last two decades. A milestone in this process was the 'Brundtland' report, which defined sustainable development as 'development that meets the needs of today's generation without compromising those of future generations'. Five years later, the UN

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Conference on Environment and Development (UNCED), the Earth Summit, established a number of international agreements, declarations and commitments (see Box 1). Agenda 21, the global action plan for sustainable development, emphasises the importance of integrated environment and development decision-making and promotes the use of EIA and other policy instruments for this purpose.

**Box 1: Four cornerstones of the Earth Summit**

- 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 stabilise 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 programme of action for achieving sustainable development to which countries are ‘politically committed’ rather than legally obligated.

## Perspectives on sustainable development

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’s poor and maintaining the development opportunities for the generations that follow.

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

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

Without major policy and technology changes, 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 thirty years 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 minimise the adverse effects of major development proposals, such as a power station, dams and reservoirs, industrial complexes, etc. This process 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 smaller scale projects, such as dredging activities, road realignment and upgrading and housing subdivisions, conform to appropriate environmental standards or site and design criteria.



## 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 well being, 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.

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**Introduce the range of environmental problems facing society. Give specific national examples, invite the participants to draw up a list of issues that are relevant to their own experience, and indicate how EIA identifies the particular impacts of development proposals and actions.**

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Numerous reports on the state of the world indicate the environmental problems facing society. 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 Box 2. 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.

Another way of subdividing environmental issues is to group them under 'green' and 'brown' agendas. The green agenda focuses on natural resource management and environmental protection issues, such as rural land and water use, forestry and fisheries and habitat and species conservation. The brown agenda is concerned with issues of industrial pollution, waste management and urban development.

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 Box 3).

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 Topic 6 – *Impact analysis*.

#### Box 2: Major environmental issues in developing regions

- **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, urbanisation and industrialisation 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, SO<sub>2</sub>, 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 urbanisation has caused worsening air and water pollution in urban centres.

Sources: UNEP, 1999; World Bank, 2000.

#### Box 3: Typology of environmental impacts

Environmental impacts can vary in:

- type – biophysical, social, health or economic
- nature – direct or indirect, cumulative, etc.
- magnitude or severity – high, moderate, low
- extent – local, regional, transboundary or global
- timing – immediate/long term
- duration – temporary/permanent



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- 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.*

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**Introduce the concept of integrated impact assessment.**

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3

In the early stages of EIA, 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 analyse 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 recognised 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 in Topic 6 – *Impact analysis* and specific treatment of social impact assessment can be found in Topic 12 – *EIA project management*.

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**Provide a brief history of the origins and development of EIA. Include where possible an outline of the history of EIA in the country/region.**

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4

EIA is one of a number of policy tools that are used to evaluate new proposals. It is also a relatively recent development when compared to use of economic appraisal methods. A number of factors led to the introduction of EIA in the US National Environmental Policy Act (NEPA, 1969), including public concern about the quality of the environment and the increasing effects of new technologies and ever-larger development schemes. In addition, then available economic appraisal techniques, such as benefit cost analysis, did not take account of the environmental and social impacts of major projects.

The architects of NEPA intended the environmental impact statement to be the 'action-forcing' mechanism, which would change the way government

decisions were made in the USA. However, they probably did not foresee the extent to which EIA would be adopted internationally, culminating in Principle 17 of the Rio Declaration on Environment and Development. Today, EIA is applied in more than 100 countries, and by all development banks and most international aid agencies.

EIA has also evolved significantly, driven by improvements in law, procedure and methodology. Major trends in EIA process development are summarised in Box 4. Except for the early pioneers, the phases and timescales identified in Box 4 do not necessarily correspond to the development of EIA in particular countries. In all countries more strategic, sustainability-based approaches are still at a relatively early stage.

#### Box 4: Major trends in EIA

The evolution of EIA can be divided into four overlapping phases:

- i) Introduction and early development (1970-1975) – mandate and foundations of EIA established in the USA; then adopted by a few other countries (e.g. Australia, Canada, New Zealand); basic concept, procedure and methodology still apply.
- ii) Increasing scope and sophistication (mid '70s to early '80s) – more advanced techniques (e.g. risk assessment); guidance on process implementation (e.g. screening and scoping); social impacts considered; public inquiries and reviews drive innovations in leading countries; take up of EIA still limited but includes developing countries (e.g. China, Thailand and the Philippines).
- iii) Process strengthening and integration (early '80's to early '90s) – review of EIA practice and experience; scientific and institutional frameworks of EIA updated; coordination of EIA with other processes, (e.g. project appraisal, land use planning); ecosystem-level changes and cumulative effects begin to be addressed; attention given to monitoring and other follow-up mechanisms. Many more countries adopt EIA; the European Community and the World Bank respectively establish supra-national and international lending requirements.
- iv) Strategic and sustainability orientation (early '90s to date) EIA aspects enshrined in international agreements (see Topic 2 – *Law, policy and institutional arrangements*); marked increase in international training, capacity building and networking activities; development of strategic environmental assessment (SEA) of policies and plans; inclusion of sustainability concepts and criteria in EIA and SEA practice; EIA applied in all OECD countries and large number of developing and transitional countries.

Source: updated and amended from Sadler, 1996



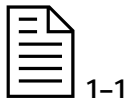
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**Introduce the key principles of EIA and discuss their relevance for local use and application.**

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To date, EIA has been applied primarily at the project-level. This ‘first generation’ process is now complemented by SEA of policies, plans and programmes, and both EIA and SEA are being adapted to bring a greater measure of ‘sustainability assurance’ to development decision making. These trends have brought new perspectives on what constitutes EIA good practice and effective performance.



1-1

Recently, a number of reviews of these issues have been undertaken, including the International Study of the Effectiveness of Environmental Assessment (see Section A). It described basic and operational principles for the main steps and activities undertaken in the EIA process. The International Association for Impact Assessment (IAIA) and the Institute of Environmental Management and Assessment (IEMA) have drawn on these to prepare a statement of EIA ‘best practice’ for reference and use by their members (see Handout 1-1).



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The Effectiveness Study identified three core values on which the EIA process is based:

- 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 in Box 5. 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, recognising 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.



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**Box 5: Guiding principles of EIA good practice**

**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; IALA and IEMA, 1999.*



1–2

Operating principles describe how the basic principles of EIA good practice should be implemented. The 24 principles listed in Handout 1–2 provide initial guidance on how to undertake EIA and what results practitioners should aim to deliver. When applying these operating principles, reference should be made to the framework of EIA legislation, procedure and guidance that is in force in a country or jurisdiction. In certain countries, the relatively early stage of EIA process development or limited resources may constrain the application of some of the operating principles.



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**Introduce the main features of the EIA system, including managing the process and deciding on its application. Provide information about the local process if there is one. Invite participants to share their experience of EIA and discuss any problems they have encountered.**

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EIA systems can be described by reference to three components:

- i. the legal and institutional framework of regulation, guidance and procedure, which establishes the requirements for the conduct of EIA;
- ii. the steps and activities of the EIA process, as applied to specific types of proposals; and
- iii. the practice and performance of EIA, as evidenced by the quality of EIA reports prepared, the decisions taken and the environmental benefits delivered.

## 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 statute. 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. Further information of these arrangements can be found in Topic 2– *Law, policy and institutional arrangements*.

In this Topic, 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:

### Basic responsibilities

The proponent 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 specialised EIA body) oversees 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.

### 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 remit, 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 inclusion of these broader aspects of EIA are now accepted as the international standard of good practice and their coverage should be mandatory.

### Consideration of alternatives

Consideration of alternatives is mandatory in some EIA systems but discretionary 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.

### Public involvement

This is a cornerstone 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.

### **Quality control and assurance**

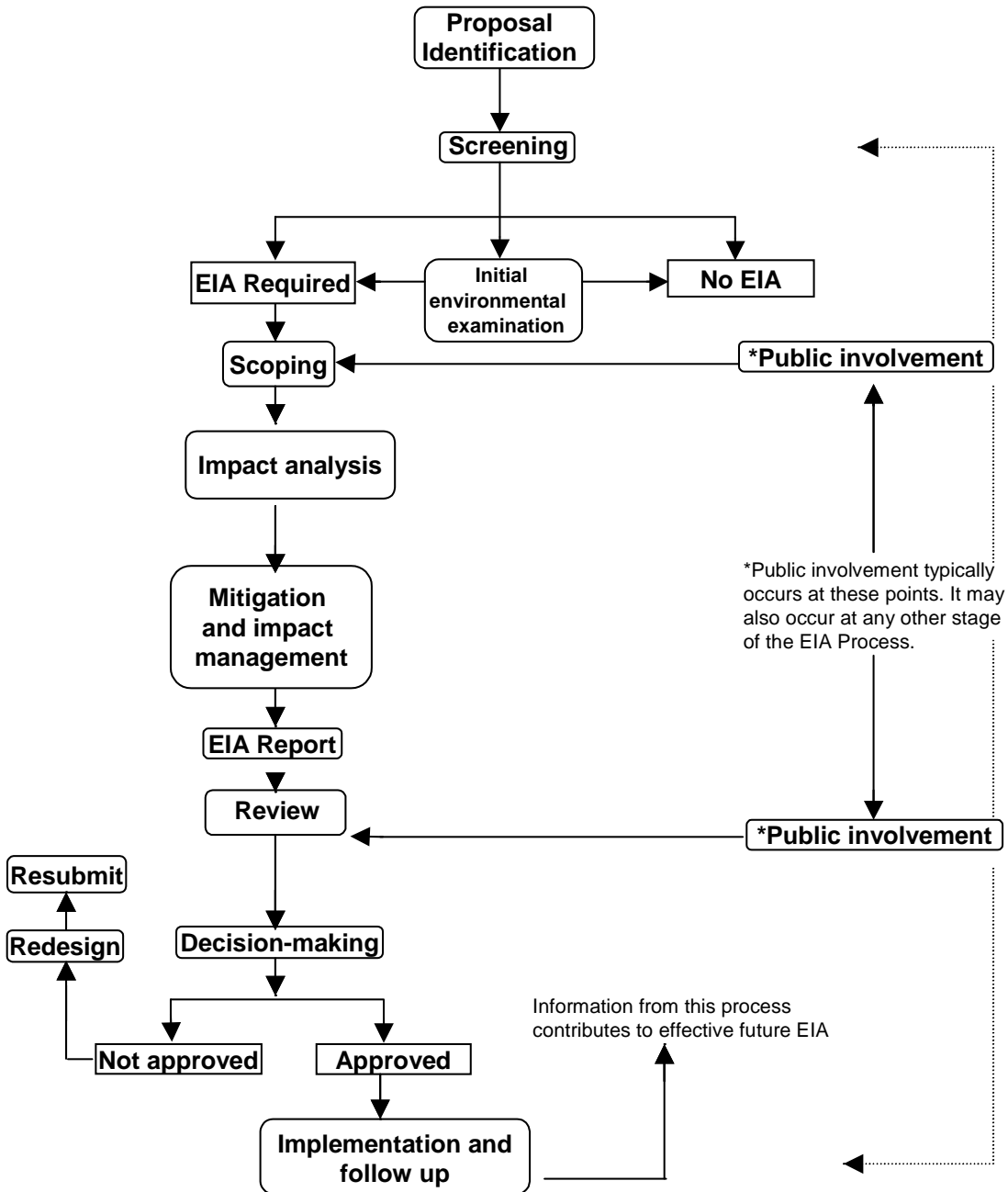
Within EIA systems, the components described above provide a set of legal and institutional controls on the quality and effectiveness of the process. In addition, the main stages of the EIA process itself constitute a further set of procedural checks and balances. The respective functions of each stage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

### **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 (see flow chart on the next page) and the application of the main stages is a basic standard of good practice. Typically, the EIA process begins with screening to ensure time and resources are directed at the proposals that matter environmentally and ends with some form of follow up on the implementation of the decisions and actions taken as a result of an EIA report.



# Generalised EIA Process Flowchart



In this Manual, a generic version of the EIA process highlights the following stages:

### Public involvement (Topic 3)

To inform the public about the proposal and to gain the inputs of those directly affected by or interested in the proposal. Public involvement in some form may occur throughout the EIA process, although it tends to be focused on scoping and review phases of EIA.

### Screening (Topic 4)

To decide whether or not a proposal should be subject to the EIA process and, if so, at what level of detail.

### Scoping (Topic 5)

To identify the key issues and impacts that are likely to require further investigation, and to prepare the terms of reference for the EIA study.

### Impact analysis (Topic 6)

To identify and predict the likely environmental and social effects of the proposal and evaluate their significance.

### Mitigation and impact management (Topic 7)

To develop measures to avoid, reduce or compensate for impacts, making good any environmental damage.

### Reporting (Topic 8)

To describe the results of the EIA for decision-makers and other interested parties.

### Review of EIA quality (Topic 9)

To examine the adequacy of the EIA report to see if it meets the terms of reference and provides the information necessary for decision-making.

### Decision-making (Topic 10)

To approve or reject the proposal and set the terms and conditions under which it can proceed. The decision-maker also has the option to defer approval (e.g. until certain conditions are met or to require a proponent to redesign the project so that the environmental effects are minimised).

### Implementation and follow up (Topic 11)

To check on the implementation of the terms and conditions of approval during the construction and operation phases; to monitor the impacts of the project and the effectiveness of mitigation measures; to take any actions necessary to ameliorate problems; and, as required, to undertake audit and evaluation to strengthen future EIA applications.



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## 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 recognised deficiencies 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. 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. Often neither area is well established.

A number of studies have drawn attention to the particular constraints on EIA practice in developing countries as compared to developed ones. However, most developing countries have some experience in EIA and some have a considerable track record, predating the introduction of the EIA Directive in Europe. There are particular limitations on domestic EIA practice in poorer countries, where typically institutional arrangements are weak, and human, technical and financial resources are lacking. In these circumstances, the development banks and international aid agencies play a major role, both long-term through capacity building for the environment and immediately through their own EIA requirements.

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 major impacts;
- influences decision making and approvals and the implementation of terms and conditions; and
- results in environmental gains and benefits (as described below).

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**Discuss the costs and benefits of using an EIA process, and provide local examples that highlight the gains that can be obtained from a well-managed EIA.**

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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 the proposal having to be modified 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 the earlier the process is applied 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 minimise risks and impacts on the environment and people, and thereby avoid associated costs of remedial treatment or compensation for damage.
- Ensuring compliance 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 undue costs of unanticipated impacts. These can escalate if environmental problems have not been considered from the start of proposal design and require rectification later. An 'anticipate 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.



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- *Reduced time and costs of approvals of development applications.* 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 that are appropriate to the people who are most directly affected by and interested in the proposal.

### 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 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 merely 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.



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**Provide suggestions for making the EIA process credible and fair. Ask participants to identify others that are relevant to their national or local situation.**

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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 and transparent manner, having regard to all the facts and the views by stakeholders and the public at large (see Topic 3 – *Public involvement*).

In addition, there are a number of specific measures that can help to make the EIA process transparent, accessible and accountable to the public. Examples of measures that reinforce the fairness of the process include:

- requiring the proponent to register all consultants, their expertise and responsibilities with the administering agency;
- publishing these details in the terms of reference and the EIA report;
- making all EIA documents and reports available to the public; and
- publishing reasons for decisions – screening and final approvals – together with requirements and terms and conditions for mitigation and environmental management plans.

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**Discuss the importance of building local capacity in EIA, referring as necessary to the framework outlined in Section B. Point out activities that support this process and enable the purposes of EIA to be achieved.**

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Capacity building is the long-term, voluntary process of increasing the ability of a country to identify and solve its own problems and risks, and to maximise its opportunities.

In this context, countries should firstly aim to carry out their own EIAs of proposals. Second, they should aim to use local experts as much as possible when undertaking EIAs of proposals financed by the World Bank and other multilateral lending agencies. Where this is not possible without compromising the quality of EIAs and outside experts must be engaged, every opportunity should be taken to transfer their expertise to local personnel. This strategy will make the implementation of EIA recommendations more effective and strengthen the basis of EIA expertise locally.

Capacity building can be carried out in a number of ways, including institutional strengthening, technical assistance and advice, and EIA training programmes. A systematic, long-term commitment will be necessary to overcome limited capacity of many developing countries to undertake EIA. In addition, this process should be backed by activities to strengthen



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education and research institutions. EIA-specific training can be done at many different levels and over different periods to meet a variety of needs (see Section D).

A systematic EIA capacity building programme will need to provide a range of different activities. These could include advice on drafting or strengthening EIA legislation and procedures, improving their application to relevant sectors, such as energy and mining, and strengthening particular aspects of practice, such as public involvement. Pilot projects involving local experts in actual EIAs of proposals can be used to transfer 'hands on' knowledge and skills. Supporting activities include developing resource materials and establishing a network of practitioners with experience in EIA or technical analysis.

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**Undertake a training activity to reinforce the topic, if appropriate, focusing on local requirements and priorities for EIA capacity building. The information obtained from the training needs analysis undertaken in Section C can be used for this purpose.**

**Conclude by summarising the presentation, emphasising the key aspects of the topic that apply locally.**

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## Reference list

The following references have been used as primary sources for this topic.

International Association for Impact Assessment (IAIA) and the Institute of Environmental Management and Assessment (IEMA) (1999) *Principles of EIA Best Practice*. IAIA, Fargo, North Dakota. (<http://www.iaia.org/publications>).

Sadler B (1996) *Environmental Assessment in a Changing World: Evaluating Practice to Improve Performance*. (Final Report of the International Study of the Effectiveness of Environmental Assessment). Canadian Environmental Assessment Agency and International Association for Impact Assessment, Ottawa, Canada.

Scott Wilson Ltd. (1996) *Environmental Impact Assessment: Issues, Trends and Practice*. Environment and Economics Unit, UNEP, Nairobi.

Serageldin I and Steer A (eds) (1994) *Making Development Sustainable*. Environmentally Sustainable Development Proceedings Series No. 2, World Bank, Washington, D.C.

World Bank (1999) *Environment Matters*. (Annual Review on the Environment). Environment Division, World Bank, Washington D.C.

UNEP, US National Agency for Space Aeronautics and World Bank (1999) *Protecting Our Planet, Securing Our Future*. UNEP, Nairobi.

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## Further reading

Canter L (1996) *Environmental Impact Assessment*. McGraw-Hill, New York.

EIA Centre (1995) *EIA in Developing Countries*. EIA Leaflet Series L15, EIA Centre, University of Manchester, UK.

Glasson J, Therivel R and Chadwick A (1999) *Introduction to Environmental Impact Assessment*. UCL Press, London.

Goodland R. and Mercier J-R (1999) *The Evolution of Environmental Assessment in the World Bank: From 'Approval' to Results*. Environment Department papers No. 67, World Bank, Washington D.C.

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## References and further reading

Petts J (1999) Environmental Impact Assessment – Overview of Purpose and Process, in Petts J (ed) *Handbook of Environmental Impact Assessment* (Vol.1) pp. 3-11. Blackwell Science Ltd, Oxford, UK.

Petts J (1999) Introduction to Environmental Impact Assessment in Practice: Fulfilled Potential or Wasted Opportunity, in Petts J (ed) *Handbook of Environmental Impact Assessment* (Vol. 2) pp. 3-9. Blackwell Science Ltd, Oxford, UK.

World Bank (1991) *Environmental Assessment Sourcebook*. (Vol.1) Environment Department, World Bank, Washington, D.C.

World Bank (1996) *The Impact of Environmental Assessment: The World Bank's Experience*. (Second Environmental Assessment Review) Environment Department, World Bank, Washington, D.C.

## Training activities

*Training activities will be more instructive if they are framed around a local proposal. Consider inviting prospective course participants to make a presentation if they have expertise in this area of EIA.*

### Discussion themes

- 1-1 How can EIA be used to better purpose to promote specific national environmental or sustainable development goals?
- 1-2 List the strengths and weaknesses of the EIA system. Discuss how the effectiveness of this system could be improved, focusing on the broader context of EIA. Identify the role of elements such as: cultural values/social structure, economic system/conditions, education, public attitudes, political structure, institutional/technical capacity, and the status of indigenous people and women. Use the results of the Training Needs Analysis to focus this discussion and to consider what could be done in each of these contexts to improve the situation?
- 1-3 Which processes currently exist nationally for EIA capacity building? Are they effective? If not, what approach would you recommend to strengthen efforts to build EIA capacity? What further support is required for the EIA capacity building?
- 1-4 Is the EIA process suited to the types of projects and activities that are undertaken in your country? How could the EIA process be adapted to make it more effective and efficient, for example in the case of small projects?
- 1-5 Are there fairness or ethical issues which prevent or constrain effective EIA? What is the nature of the problem and what measures could be taken to improve the situation?

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### Speaker themes

- 1-1 Invite a speaker who has a broad experience in the EIA process to give examples of the costs and potential benefits of the EIA process to project development and environmental protection.
  - 1-2 Invite a speaker with a good knowledge of the national experience of EIA to provide a history of the process and a view of the directions in which it is moving.
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## Group Activity 1-1: Introduction and overview of EIA

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**Title:** Building the EIA process

**Aim:** Developing an awareness of the relationship between the stages of the EIA process

**Group size:** Pairs

**Duration:** 45 minutes

**Resources required:**

- A set of cards (about 75 x150 mm) with the names of the steps in the EIA process written on (use local process where possible).
- Large piece of paper or overhead transparency for collating the results.
- A flowchart of the local EIA process.

**Description of activity:**

- Allow each group of two to arrange the cards in the order in which they think EIA is performed. Get them to identify the inputs and outputs for each stage.
  - Bring groups together and discuss the results, focusing on the relationship between the different stages. Emphasise that the steps are not rigid but are iterative.
-

## Aims and objectives of EIA

EIA can

- modify and improve design
- ensure efficient resource use
- enhance social aspects
- identify key impacts and measures for mitigating them
- inform decision-making and condition-setting
- avoid serious and irreversible damage to the environment
- protect human health and safety




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## Environmental impacts

- type and nature
- magnitude
- extent
- timing
- duration
- uncertainty
- reversibility
- significance




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## Integration within EIA:

EIA process addresses the following environmental impacts:

- biophysical and resource use
- social and cultural
- health and safety
- economic and fiscal
- landscape and visual
- indigenous peoples rights and traditional areas




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## US National Environmental Policy Act (proclaimed in 1970)

NEPA called for:

- consideration of environmental values in decision making
- use of a systematic, interdisciplinary approach for this purpose
- a detailed statement on:
  - the environmental impact of proposals for major federal actions
  - any adverse effects which cannot be avoided
  - alternatives to the proposed action
- making the statement available to the public.

This process became known as Environmental Impact Assessment

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### Evolution of EIA

- early 1970s – initial development
- 1970s to 1980s – increasing scope
- mid to late 1980s – process strengthening and policy integration
- mid 1990s – towards sustainability (SEA, Biodiversity)



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### EIA – Three core values

- integrity – the EIA process will conform to agreed standards
- utility – the EIA process will provide balanced, credible information for decision-making
- sustainability – the EIA process will result in environmental safeguards



7 & 8

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### EIA – guiding principles

The EIA process should be:

- purposive – meeting its aims and objectives
- focused – concentrating on the effects that matter
- adaptive – responding to issues and realities
- participative – fully involving the public
- transparent – clear and easily understood
- rigorous – employing ‘best practicable’ methodology
- practical – establishing mitigation measures that work
- credible – carried out with objectivity and professionalism
- efficient – imposing least cost burden on proponents



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### Key operating principles of good EIA practice

EIA should :

- be applied to all proposals with significant impacts
- begin early in the project cycle
- address relevant environmental, social and health impacts
- identify and take account of public views
- result in a statement of impacts and mitigation measures
- facilitate informed decision making and condition setting



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### Generalised EIA process flowchart

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11 &amp; 12

### The EIA process:

- 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 – to predict the effects of a proposal and evaluate their significance
- mitigation – to establish measures to prevent, reduce or compensate for impacts
- reporting – to prepare the information necessary for decision-making
- review – to check the quality of the EIA report.
- decision-making – to approve (or reject) the proposal and set conditions
- follow up – to monitor, manage and audit the impacts of project implementation
- public involvement – to inform and consult with stakeholders



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### Benefits of EIA include:

- environmentally sound and sustainable design
- better compliance with standards
- savings in capital and operating costs
- reduced time and costs for approvals
- increased project acceptance
- better protection of the environment and human health



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### Delays are caused during EIA when:

- the EIA is commenced too late in the project cycle
- the terms of reference are poorly drafted
- the EIA is not managed to a schedule
- the EIA report is inadequate and needs to be upgraded
- there is a lack of technical data



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### Ensuring fairness in the EIA process

- register consultants' names and terms of reference
- name consultants and their expertise in the EIA report
- make EIA reports available to the public
- publish lists of screening and final decisions along with conditions for approval

## EIA 'best practice'

**EIA 'best practice'**

Issued by the International Association for Impact Assessment and UK Institute of Environmental Assessment [now the Institute of Environmental Management and Assessment]

**Environmental Impact Assessment should be:**

**Purposive** – the process should inform decision-making and result in appropriate levels of environmental protection and community well-being.

**Rigorous** – the process should apply 'best practicable' science, employing methodologies and techniques appropriate to address the problems being investigated.

**Practical** – the process should result in information and outputs which assist with problem solving and are acceptable to and able to be implemented by proponents.

**Cost-effective** – the process should achieve the objectives of EIA within the limits of available information, time, resources and methodology.

**Efficient** – the process should impose the minimum cost burdens in terms of time and finance on proponents and participants consistent with meeting accepted requirements and objectives of EIA.

**Focused** – the process should concentrate on significant environmental effects and key issues; i.e., the matters that need to be taken into account in making decisions.

**Adaptive** – the process should be adjusted to the realities, issues and circumstances of the proposals under review without compromising the integrity of the process, and be iterative, incorporating lessons learned throughout the proposal's life cycle.

**Participative** – the process should provide appropriate opportunities to inform and involve the interested and affected publics, and their inputs and concerns should be addressed explicitly in the documentation and decision-making.

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

**Credible** – the process should be carried out with professionalism, rigor, fairness, objectivity, impartiality and balance, and be subject to independent checks and verification.

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

**Transparent** – the process should have clear, easily understood requirements for EIA content; ensure public access to information; identify the factors that are to be taken into account in decision making; and acknowledge limitations and difficulties.

**Systematic** – the process should result in full consideration of all relevant information on the affected environment, of proposed alternatives and their impacts, and of the measures necessary to monitor and investigate residual effects.

## EIA 'best practice'

The EIA process should provide for:

**Screening** – to determine whether or not a proposal should be subject to EIA and, if so, at what level of detail.

**Scoping** – to identify the issues and impacts that are likely to be important and to establish terms of reference for EIA.

**Examination of alternatives** – to establish the preferred or most environmentally sound option for achieving the objectives of a proposal

**Impact analysis** – to identify and predict the likely environmental, social and other related effects of the proposal.

**Mitigation and impact management** – to establish the measures that are necessary to avoid, minimise or offset predicted adverse impacts and, where appropriate, to incorporate these into an environmental management plan or system.

**Evaluation of significance** – to determine the importance or acceptability of residual impacts that cannot be mitigated.

**Preparation of environmental impact statement (EIS) or report** – to document the impacts of the proposal, the significance of effects, and the concerns of the interested public and the communities affected by the proposal.

**Review of the EIS** – to determine whether the report meets its terms of reference, provides a satisfactory assessment of the proposal(s) and contains the information required for decision-making.

**Decision-making** – to approve or reject the proposal and to establish the terms and conditions for its implementation.

**Follow up** – to ensure compliance with the terms and conditions of approval; to monitor the impacts of development and the effectiveness of mitigation measures; and, where required, to undertake environmental audit and process evaluation to strengthen future EIA applications and mitigation measures and to optimise environmental management.

## EIA operating principles

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### EIA operating principles of good practice and performance

#### EIA should be applied:

- to all proposals likely to cause potentially significant adverse impacts or add to actual or potentially foreseeable cumulative effects;
- so that the scope of review is consistent with the size of the proposal and commensurate with the likely issues and impacts;
- to provide timely and appropriate opportunities for public and stakeholder involvement, with particular attention given to indigenous peoples and other vulnerable minorities whose cultural traditions and way of life may be at risk; and
- in accordance with the legislation, procedure and guidance in force and with reference to international standards of EIA good practice.

#### EIA should be undertaken:

- throughout the project cycle, beginning as early as possible in the pre-feasibility stage;
- with explicit reference to the requirements for decision-making and project approval and authorization consistent with the application of 'best practicable' science and mitigation techniques;
- in accordance with proposal-specific terms of reference, which should include clearly defined tasks, responsibilities, requirements for information and agreed timelines for their completion; and
- to gain the inputs and views of all those affected by or interested in the proposal and/or its environmental impacts.

#### EIA should address, as necessary and appropriate:

- all relevant environmental impacts, including land use, social, cultural, economic, health and safety effects;
- cumulative effects and area-wide, ecosystem-level and global changes that may occur as a result of the interaction of the proposal with other past, current or foreseeable activities;
- alternatives to the proposal, including design, location, demand and activity alternatives;
- mitigation measures for each of the main impacts identified; and
- sustainability considerations, including the effects of depletion of non-renewable resources, of exceeding the regenerative and assimilative capacity of renewable resources and of reduction of biological diversity, taking account of relevant international agreements and commitments.

**EIA operating principles**

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**EIA should result in:**

- systematic identification of the views and inputs of those consulted, including the balance of opinion on major issues and areas of agreement and disagreement;
- comparison of the impacts of the main alternatives considered with an environmental justification for the preferred option;
- best estimate prediction and evaluation of the potentially significant residual effects that cannot be mitigated;
- feasible, cost-effective measures to mitigate the main impacts identified (often called an environmental management plan);
- preparation of an EIA report that presents this information in form that is clear, understandable and relevant for decision-making, noting any important qualifications for the predictions made and mitigation measures proposed; and
- resolution of problems and conflicts during the EIA process to the extent this is possible

**EIA should provide the basis for:**

- informed decision-making and project approvals, in which the terms and conditions are clearly specified and implemented;
- design of environmentally sound and acceptable projects that meet health and environmental standards and resource management objectives;
- appropriate follow-up, including monitoring, management and auditing, to check for unforeseen impacts or mitigation measures that do not work as intended; and
- future improvements in EIA process and practice, drawing on the information from follow up activities.

*Source: Sadler, 1996; amended for this Manual.*