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Division of Technology, Industry and Economics
Economics and Trade Branch

Environmental Impact Assessment
Training Resource Manual

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Environmental Impact Assessment Training Resource Manual

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This is the second edition of the EIA Training Resource Manual prepared by
The Institute of Environmental Management and Assessment
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and

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The United Nations Environment Programme

The United Nations Environment Programme (UNEP) is the overall coordinating environmental organization of the United Nations system. Its mission is to provide leadership and encourage partnerships in caring for the environment by inspiring, informing and enabling nations and people to improve their quality of life without compromising that of future generations.

UNEP's Economics and Trade Branch (ETB) is one of the branches of the Division of Technology, Industry and Economics (DTIE). Its mission is to enhance capacities of countries, particularly developing countries and countries with economies in transition, and to integrate environmental considerations in development planning and macroeconomic policies, including trade policies. The work programme of the Branch consists of three main components: economics, trade and financial services. The Economics component of the programme focuses on enhancing the capacities of countries, particularly developing countries and countries with economies in transition, to develop and implement assessment tools and economic instruments.

UNEP's work on assessments includes the further development and promotion of environmental impact assessment as an effective tool to integrate environmental considerations at the project, programme and policy levels to achieve sustainable development.

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At the end of each topic section there are detailed acknowledgments of the many authors whose texts provided the basic materials for the compilation of the sections of the Manual. In particular, when first drafting the Manual extensive use was made of the report of the International Study of the Effectiveness of Environmental Assessment prepared by Barry Sadler and published by the Canadian Environmental Assessment Agency and the International Association for Impact Assessment and the companion document on EIA: Issues, Trends and Practice developed for UNEP by Ron Bisset (then of Scott Wilson, Ltd.), with the guidance and technical support of the UNEP International Working Group on EIA.

Thanks to all.

About this manual

This manual is intended to support capacity development in Environmental Impact Assessment (EIA). It is a tool for trainers who have some background experience and understanding of EIA. It is designed to assist them in preparing and delivering training courses that provide an understanding of, and basic capability in, the application of EIA.

Specifically, the manual is designed to assist trainers to:

- *identify local EIA needs and priorities;*
- *custom design training courses to meet these needs;*
- *undertake EIA training as part of a strategy for capacity building; and*
- *encourage networking of EIA professionals to facilitate exchange of information and develop new skills.*

A range of courses can be prepared by using the manual. For instance, a short programme can be designed for high-ranking government officials to introduce the benefits of the EIA process and its role in sustainable development. Alternatively, longer courses can be designed for EIA practitioners who require a detailed understanding of some or all of the stages involved in the EIA process.

The manual forms the centrepiece of a package of EIA training materials, which includes two companion or supporting volumes:

- *Environmental Impact Assessment and Strategic Environmental Assessment: Towards an Integrated Approach* which describes aspects of international experience in EIA good practice and the development of integrated approaches to impact assessment.
- *Case Studies of EIA Practice in Developing Countries*, which describes the realities, and provides examples of implementation, of the main elements and steps of the EIA process.

Together with these materials, the manual can be used to design and present EIA training courses that draw on lessons of EIA good practice and relate these to the situation in developing and transitional countries. Above all, the manual should be applied and adapted with reference to EIA needs. These should be identified at the start of the process and before training commences. This analysis should also assist in incorporating local sources of information, contacts and case studies, which can be used to make the training more relevant, useful and interesting to course participants.

The current manual is based on the results of pilot testing, in learning situations, of a preliminary version. It will be available later this year on-line, together with the two companion volumes, the reports of the trials and other supplementary information at <http://www.environment.gov.au/net/eianet.html>

This edition also has been updated to reflect the developments in EIA law, process and practice that have occurred since the preliminary version was prepared. New and revised training topics in Section E were reviewed by a number of EIA experts. The review group comprised: Elvis Au (Hong Kong), Charlotte Bingham (USAID), Ron Bisset (UK), Elizabeth do Nascimento Brito (InterAmerican Development Bank), Peter Croal (Canada), Jiri Dusik (Czech Republic), Robert Goodland (World Bank), Ram Khadka (Nepal), Nenad Mikulic (Croatia), Parvaiz Naim (Pakistan), Amech Onianwa (Nigeria), Maria do Rosario Partidario (Portugal), Robin Saunders (Australia), Abdoulaye Sene (Senegal), Pierre Senecal (Canada), Martin Ward (New Zealand), Alex Weaver (South Africa), Iara Verocai (Brazil).

Manual design and content

The manual is in five main sections:

- Section A** introduces the manual and how to use it.
- Section B** describes the role and importance of EIA training and capacity building.
- Section C** contains the outline of a Training Needs Analysis, some or all of which can be used to identify or confirm the specific training requirements.
- Section D** contains advice on how to design, present and evaluate training courses.
- Section E** is a series of training topics addressing the key steps involved in the EIA process. These topics are all in a similar format and provide session outlines; a selection of training activities; a reading list and other references; as well as other resource materials such as overhead projector sheets and handouts.

The manual in perspective

This section describes the rationale, aims and approach of the manual. It provides an orientation for trainers and others on the use and interpretation of the manual and lists contacts and references that can be used to obtain additional information about the EIA process.

Capacity building and the environment

This section outlines a framework for undertaking EIA training based on the concept and principles of capacity building. It elaborates several perspectives that EIA trainers should bear in mind when using this manual, including precepts and measures to support and ensure the quality of EIA training.

Training needs analysis

This section of the manual first provides guidance about collecting background EIA information and materials, as part of training needs analysis. It can be used to identify or confirm specific EIA training requirements and to highlight the influence that the economic, political and social contexts may have on the presentation of the course. Several aids and tools for this purpose are described, including a training needs workshop to bring together a cross-section of EIA stakeholders.

The full workshop may not always be needed if the training needs are very clear and the context in which the training is undertaken is well understood.

Finally, this section on the analysis of training needs contains a short questionnaire that can be completed by each course participant before a course begins so that the trainer can gain an understanding of their individual needs.

Course design, delivery and evaluation

This section provides the tools to:

- *develop course outlines*
- *present courses effectively*
- *prepare participant handbooks*
- *evaluate the success of a course*

Training topics

A series of training topics is provided. These are focused on the key stages of EIA and other important related issues.

The training topics are structured to provide

- *background materials in the form of session outlines;*
- *training activities including detailed group activities and themes for discussion or speakers;*
- *references; and*
- *resource materials.*

These materials have been packaged to encourage the trainer to incorporate local materials and information. The trainer should add or delete materials to suit the needs of the participants as identified during the training needs analysis.

It is envisaged that practitioners developing new country-specific materials will make these available to their colleagues and will build up a network of training and practitioner contacts to encourage this exchange of materials.

Layout of sections

Icons

The margin icons appear in each of the Training Topic sections and are designed for the quick identification of other actions, or materials, that can contribute to the training.



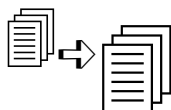
OHP

indicates that an overhead projection transparency is available at the end of the topic and can be shown at this time to illustrate a point, or to sum up ideas introduced in the session.



Handout

indicates a handout which can be copied from the resource materials supplied at the end of each topic.



Proforma

reduced-size tables and diagrams are often included in the text. The proforma icon indicates that full-sized proforma sheets are available for copying at the end of the topic.

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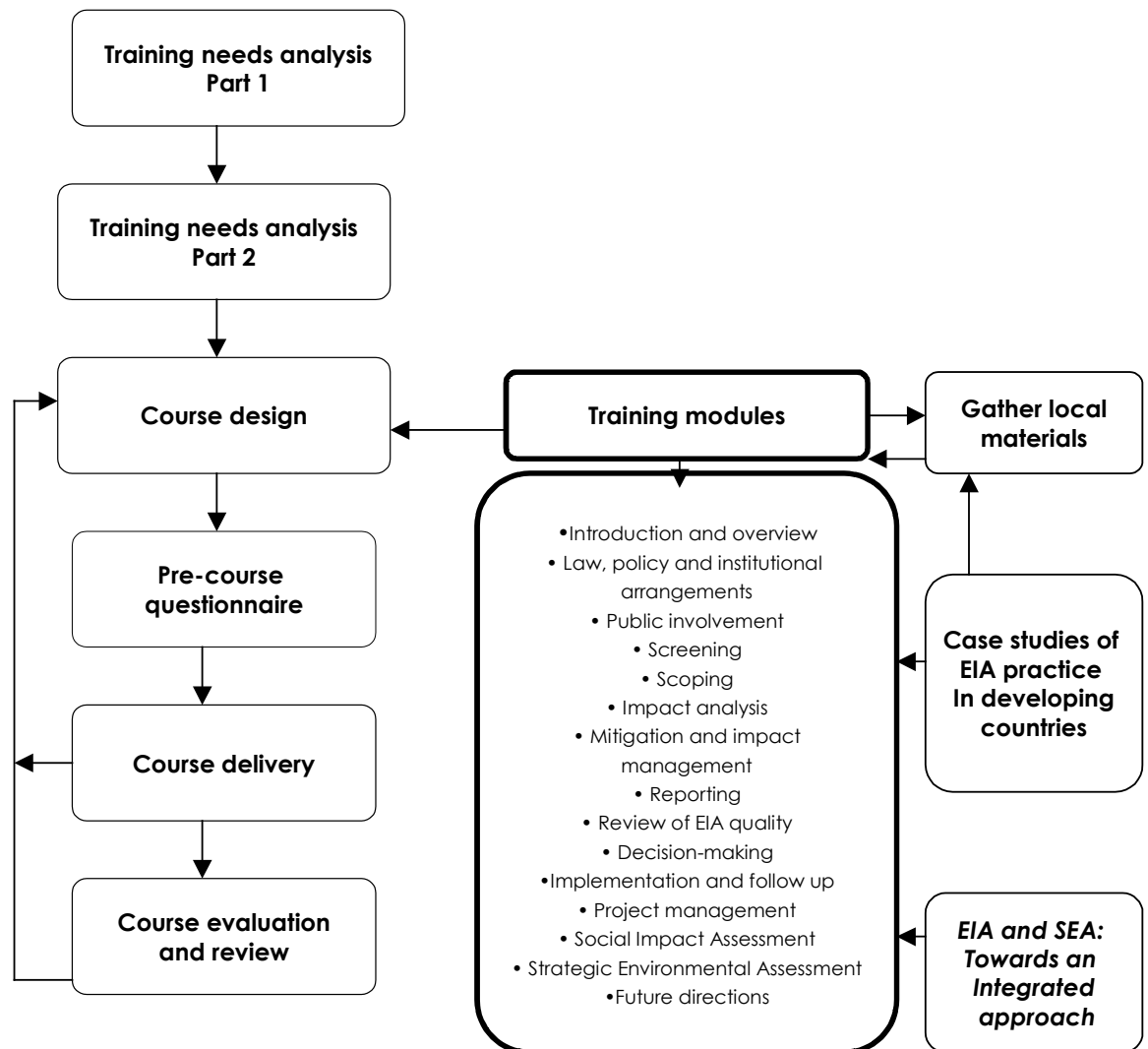
Acronyms and Glossary

Section E

Training topics

- **Base your training on the needs identified in the training needs analysis, and adapt the materials accordingly.**
- **Develop materials and exercises which specifically reflect local situations.**
- **Plan to incorporate the experience and knowledge of participants as identified in the participant's questionnaire.**
- **Recognise that it may not be necessary, or appropriate, to use ALL the materials or training exercises.**

Designing a training course using this manual



Topic 1

Introduction and overview of EIA

Introduction

Checklist

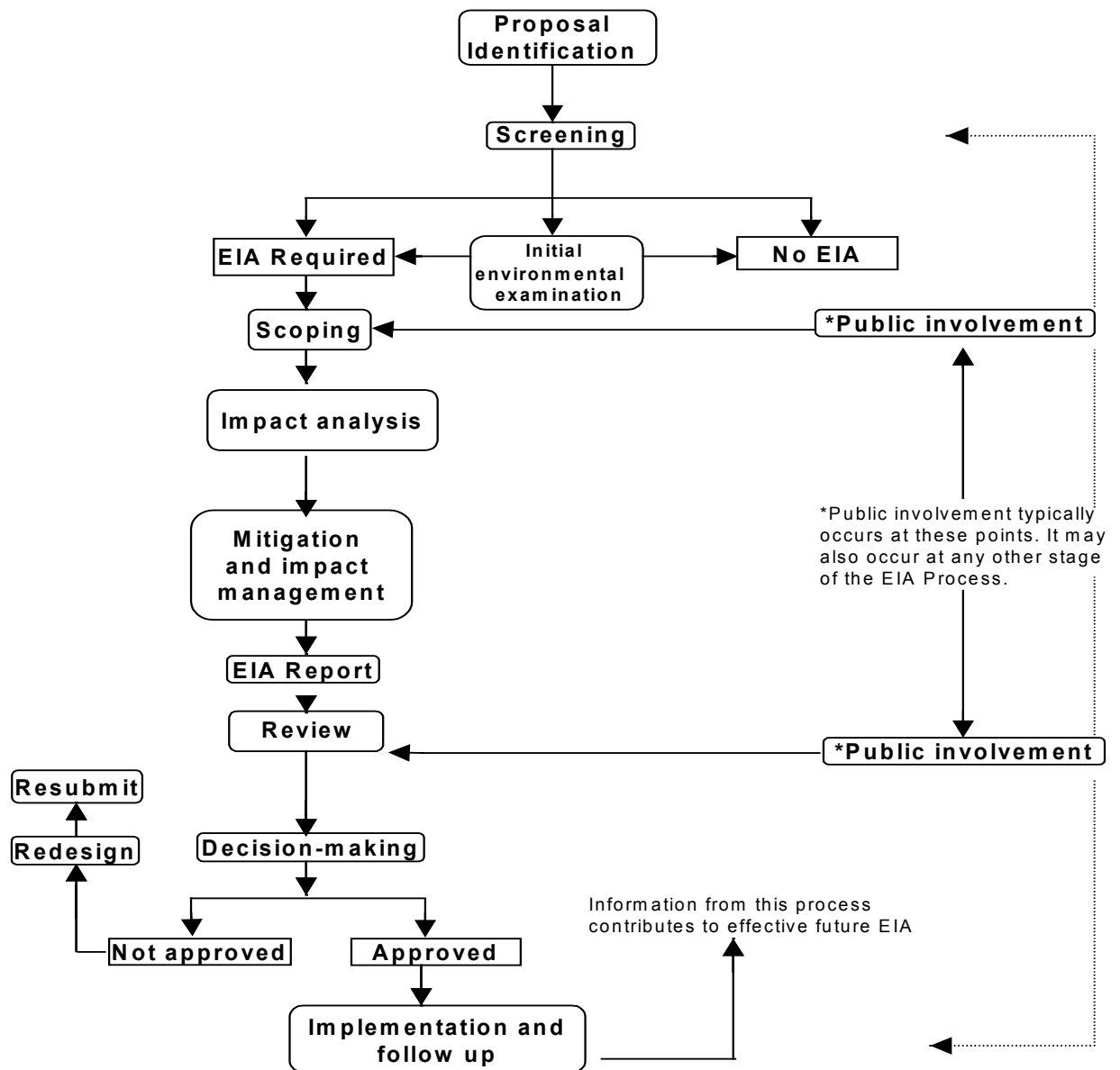
Session outline

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.

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.

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.

**Topic 1
Introduction
and
overview of
EIA**



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

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.

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.
-

Briefly define EIA, describing its character and purpose.

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.
-

Discuss the meaning of sustainable development and the role that EIA can play as a tool in moving towards sustainability.

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.



1

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.

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.

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, 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 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



2

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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.*

Introduce the concept of integrated impact assessment.



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*.

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.



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

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

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



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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.

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.

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.

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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

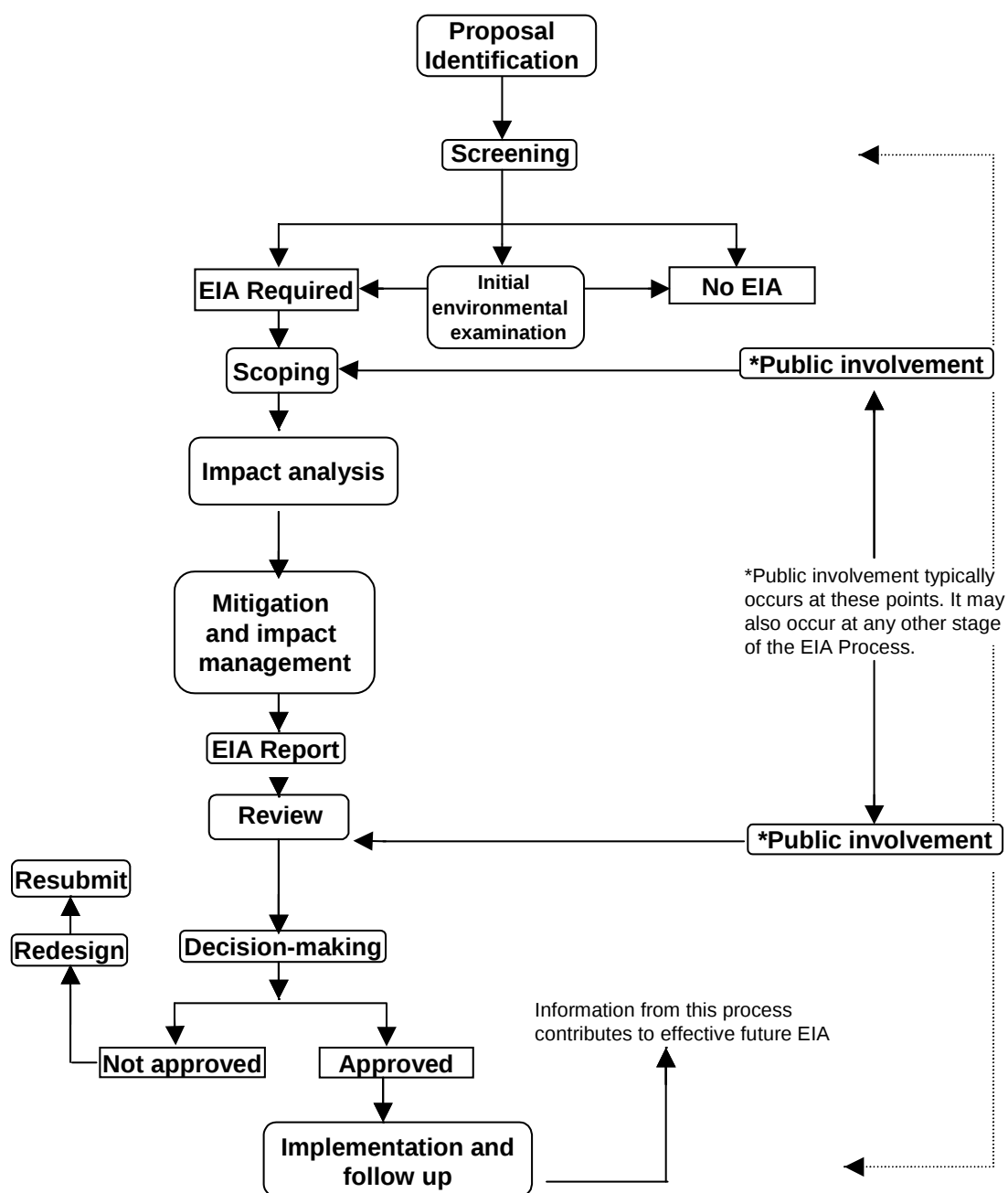
requirements; e.g. regarding access to information, procedures for notification and involvement of the public, the stage of the EIA process at which these are applied and third party rights of appeal. At a minimum, public involvement should take account of the concerns of those directly affected by a 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.



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 EIA 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).

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.

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.

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.

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.

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.

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.

Reference list

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

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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?

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.
-

Group Activity 1–1: Introduction and overview of EIA

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



1

Environmental impacts

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



2

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



3

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



4



5

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



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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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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

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

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.

Topic 2

Law, policy and institutional arrangements for EIA systems

Introduction

Checklist

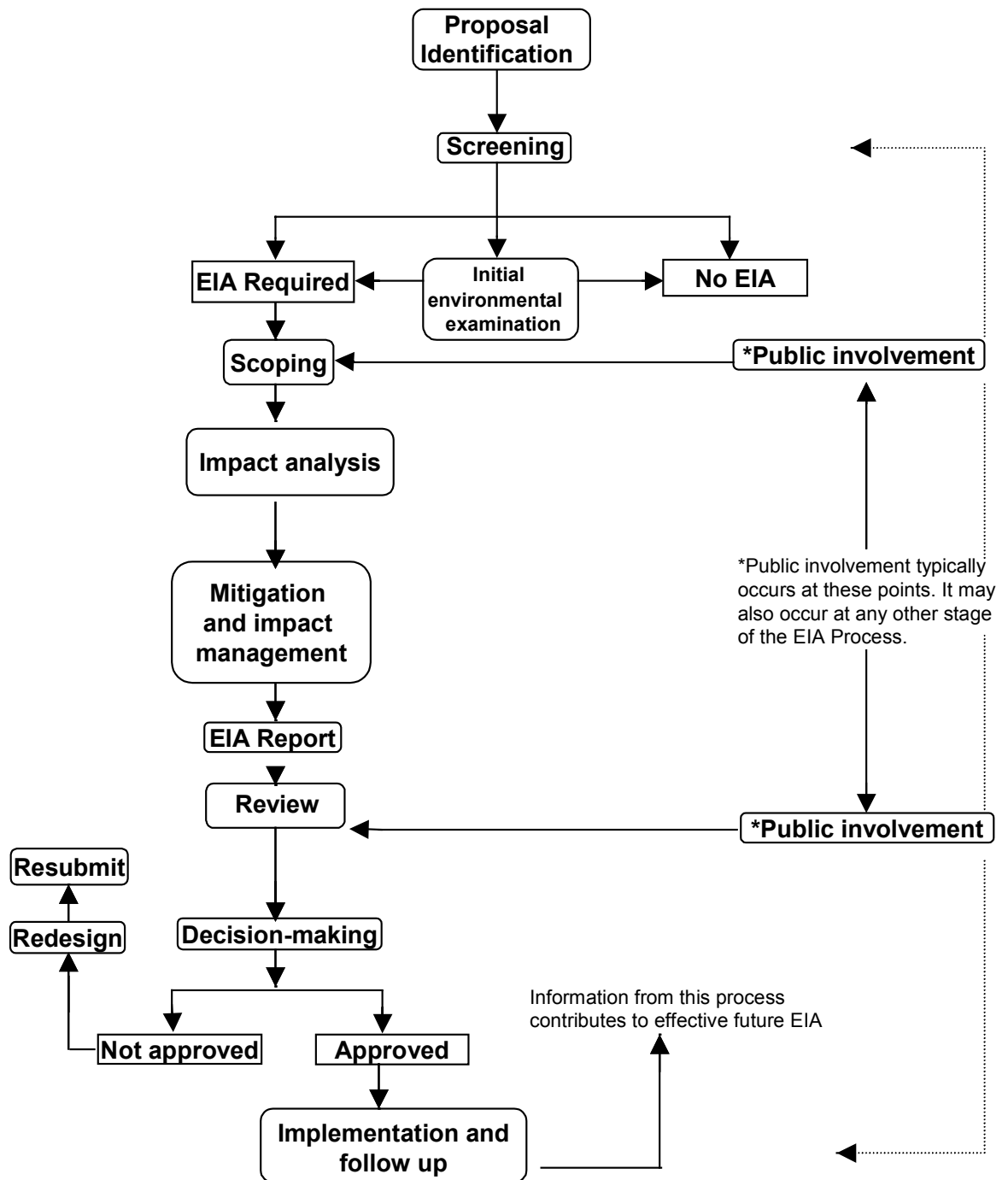
Session outline

Reference list and further reading

Training activities

Support materials

Generalised EIA Process Flowchart



Topic 2—Law, policy and institutional arrangements for EIA systems

Objectives

To provide an overview of the different types of EIA systems which are in place.

To identify the legal, policy and institutional arrangements and directions which are important.

To consider the factors that are important when establishing or modifying an EIA system.

Relevance

EIA takes place within the legal and/or policy frameworks established by individual countries and international agencies. Its practice can be improved through a better understanding of the different arrangements that are made for EIA provision and procedure, and how these can contribute to successful EIA. Those developing or reviewing EIA systems need to be particularly aware of the strengths and weaknesses of existing arrangements and the elements that can improve EIA as a tool to achieve sustainable development.

Timing

Two to four hours (not including training activity). Note that the length of the session will depend upon whether the UNECE recommendations in Handout 2–1 are worked through in detail.

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:

- ☐ EIA legislation, regulations, orders and directives that are used in the country or region;
- ☐ information on any proposed changes to these;
- ☐ guidelines, agreements or memoranda of understanding that apply to EIA;
- ☐ agreements or means of resolving conflicts where more than one set of EIA arrangements apply to the project;
- ☐ information about how the EIA system addresses any responsibilities that the country has under the international environmental agreements;
- ☐ reviews and analyses of the strengths and weaknesses of applicable legal, policy and institutional arrangements;
- ☐ contact names and telephone numbers of people, agencies, organisations and environmental information/data resource centres able to provide assistance and information regarding national EIA arrangements and developments; and
- ☐ other resources that may be available such as videos, journal articles, computer programmes, lists of speakers, case studies.

Session outline

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 they are important.



1 & 2

This topic provides insight into the different types of EIA systems, the range of legal, policy and institutional arrangements that can be provided and the directions in which these are developing. It also examines the factors that need to be considered when establishing or modifying a national EIA system.



3

Very briefly review the aims and main elements of the EIA process.

Briefly run through the main stages and components of the EIA process.



4

Review the key trends in the development of EIA systems.

Emphasise that EIA is an evolving process. When establishing or strengthening an EIA system, there is an opportunity to build upon the experience of others and to move towards legal and policy frameworks that support environmental sustainability.

Begin by noting that EIA systems have become progressively more broadly based, encompassing a wider range of impacts, higher levels of decision-making and new areas of emphasis (as described in Topic 1 – *Introduction and overview of EIA*). In particular, there are trends toward:

- more systematic procedures for EIA implementation, quality control, compliance and enforcement;
- integrated consideration of biophysical, social, risk, health and other impacts;
- extended temporal and spatial frameworks, which include cumulative, trans-boundary and ecosystem-level effects and, to a lesser extent, global change;
- increasing provision for strategic environmental assessment (SEA) of policy, plan and programme proposals;
- incorporation of sustainability perspectives and principles into EIA and SEA processes; and

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- greater linkage of EIA systems with other planning, regulatory and management regimes.

These trends are identified in the International Study of EA Effectiveness. This study also illustrates how EIA has become institutionalised and looks at the strengths and weaknesses of current practice in relation to different legal policy and institutional arrangements. Other recent and relevant sources of information include the *Handbook of Environmental Impact Assessment* and the *Environmental Assessment Sourcebook Updates* issued by the World Bank (see references).

Many lessons can be drawn from these materials by those who are responsible for introducing or modifying EIA systems, or are amending particular legal, policy and institutional arrangements to international standards. Not all aspects may be appropriate or replicable in certain developing countries without further EIA capacity development (see Section B). However, there is a general trend toward strengthening the foundations and key features of EIA systems in both developed and developing countries. Key institutional milestones are summarised in Box 1.



5

Box 1: Key international developments in EIA law, policy and institutional arrangements – the last decade

- Rio Declaration on Environment and Development calls for use of EIA as an instrument of national decision-making (Principle 17); other principles also relevant to EIA practice (e.g. Principle 15 on the application of the precautionary approach).
- UN Conventions on Climate Change and Biological Diversity (1992) cite EIA as an implementing mechanism (Articles 4 and 14 respectively refer)
- Comprehensive reform of long-established EIA systems; e.g. New Zealand (1991), Canada (1995), Australia (1999).
- New or revised EIA legislation enacted by many developing and transitional countries; e.g. Vietnam (1993), Uganda (1994), Ecuador (1997).
- EIA requirements and procedures applied by international financial and aid agencies to loans and projects in developing countries.
- Amendment of EC Directive on EIA (1997) required all member states to be in compliance by 1999; also being transposed into the EIA laws of certain countries in transition, which are in the process of accession to the European Union.
- EC Directive on SEA of certain plans and programmes (2001) which is to be implemented by member states by 2004.
- UNECE (or Espoo) Convention on EIA in a Transboundary Context (1991) entered into force in 1997 as the first EIA-specific international treaty.

- Doha Ministerial Declaration encourages countries to share expertise and experience with Members wishing to perform environmental reviews at the national level (November 2001).
- UNECE (or Aarhus) Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters (1998) covers the decisions at the level of projects and plans, programmes and policies and, by extension, applies to EIA and SEA (Articles 6 and 7 respectively refer).

Updated and amended from Sadler, 1996

Briefly identify the legal and institutional characteristics that are in place in a given country or region and consider how they may need to be developed or strengthened.

Every EIA system is distinctive to some degree, reflecting the political system of a country. An EIA framework or components from one country (or international organisation) may not be readily imported into another, at least without significant adaptation. The information gathered during the Training Needs Analysis should help in identifying current and needed activities in the development of an EIA system (see Section C).

What are the key features to look for, and how do they differ? Table 1 provides a framework for examining EIA systems. It can be used to develop a profile of the key provisions that apply, including:

- the designation of an authority responsible for overseeing the implementation of EIA procedure;
- the requirement for public participation, and whether it is a mandatory or discretionary procedure; and
- procedural checks and balances for EIA quality control, comprising key stages of the EIA process (outlined in the flow chart).

The matrix will be most useful when used to compare the EIA systems of countries in the same region. When completed, the table can be used to identify directions in which legal, policy and institutional arrangements might be strengthened. In some developing countries for example the arrangements for public participation made by individual countries may vary significantly, reflecting different traditions and styles of governance. Some countries have established a separate EIA authority; in others the EIA process is administered by the environment department or by the planning authority. No single EIA model is appropriate for all countries.

Table 1: Analysing legal, policy and institutional arrangements

Country	Type of EIA Authority	Legal provision Yes/No	Mandatory compliance Yes/No	Requirement for public participation Yes/No	Procedural checks and balances Yes/No identify types*

*Refer to stages of the flow chart on the verso of the Topic Divider

Finally, consideration also can be given to the extent to which SEA or a near equivalent process is in place. An increasing number of developed countries and countries in transition now make formal provision for SEA of policies, plans and programmes. Many developing countries also have planning systems that include elements of SEA. The legal, policy and institutional arrangements for SEA are more varied than those for project EIA (see Topic 14 – *Strategic Environmental Assessment*).

Now review types and examples of EIA systems that may be adopted. Also consider international developments that are relevant and/or applicable to EIA legal, policy or institutional arrangements for a given country. Identify particular aspects that may be used in designing or developing the EIA framework.



6

Two main types of legal provision are made for EIA:

- general environmental or resource management law, which incorporates EIA requirements and procedure; and
- an EIA specific law, which can either be comprehensive or take the form of a framework or enabling statute.

Selected examples of national and international EIA systems are given below to illustrate legal, policy and institutional arrangements that are of particular interest. These include the EIA components and responsibilities that apply

internationally under certain treaties or as result of the lending requirements of the major development banks. Their geographical scope of application varies and not all aspects will be relevant to particular countries.

Some national and international examples of EIA legislation

Examples of EIA legislation that set precedents or have been used by other countries include:

- *US National Environmental Policy Act (NEPA, 1969)*. NEPA has been called the Magna Carta of EIA. It is both the founding legislation and remains a pre-eminent statement of the spirit and purpose of EIA. The language in the purpose and declaratory sections of NEPA corresponds to the objectives and principles of sustainability, anticipating by more than 20 years that contained in the Rio Declaration. Section 102 defines the procedural requirement for the preparation of an environmental impact statement (EIS), which have been subject to considerable reinterpretation by the courts.
- *New Zealand Resource Management Act (RMA, 1991)*. Internationally, the RMA is significant as a sustainability benchmark, which was the result of a four-year process of law and government reform. The RMA is an omnibus law, which repealed or amended numerous statutes, regulations and orders and integrated their functions into one legal regime with a single purpose of 'promoting the sustainable management of natural and physical resources'. Section 5 of the Act defines sustainable management amongst other things as avoiding or remedying adverse environmental impacts. This imposes a biophysical test of sustainability on activities. The RMA does not define an EIA process (instead this is detailed in a good practice guide issued by the Ministry of Environment).
- *Canadian Environmental Assessment Act (CEAA, 1993; proclaimed in 1995)*. CEAA is an example of a comprehensive EIA-specific law, passed in response to a series of legal challenges and rulings on the previous 1984 Guidelines Order. The legislation is of interest internationally because it entrenches the principle of public participation, designates the responsibilities of federal authorities in regulations (the law list) and prescribes the requirements and procedure for undertaking different levels of EIA (initial screening report, comprehensive study and public review by either an independent panel or a mediator). The Act applies only to projects; a separate SEA process applies to policy and plans (established 1990; amended 1999).
- *European Commission (EC) Directive on EIA (1985, amended 1997)*. The EIA Directive is a framework law that is binding upon member states. It sets out the principles and procedural requirements for EIA within the European Union, leaving it to the discretion of member states as to how these are transformed into national legislation. Recent

amendments to the Directive have strengthened a number of key provisions, notably in relation to screening, consideration of alternatives, public consultation and decision-making. A proposed EC Directive on SEA of plans and programmes, currently under negotiation, is closely modelled on the EIA Directive (see Topic 14 – *Strategic Environmental Assessment*).

The requirements of the Directive are also reflected in the EIA legislation, policy and institutional arrangements of countries beyond the boundaries of the European Union, notably by applicant countries of Central and Eastern Europe (CEE) which are bringing their own EIA systems into line with them. In addition, the Directive can be expected to influence EIA law making in other CEE countries in transition and may have a more generalised influence as a relatively standardised, commonly accepted, minimum process for EIA (see Box 2).

Box 2: Provisions of the European Directive on EIA

The current Directive (97/11/EC) amends the earlier EIA Directive (85/337/EEC).

Key provisions include:

- broad definition of the effects to be considered
- mandatory application for specified projects
- requirement to submit an EIA report
- types of information to be provided by developer
- outline of alternatives studied and reasons
- submission to be made available for public comment
- results of consultations and information must be taken into consideration in decision-making
- content and reasons for decisions made public detailed arrangements for public consultation to be drawn up by Member States

International environmental law and policy of relevance to EIA

As shown in Box 1, significant developments have taken place in international environmental law and policy which are relevant to or applicable by the EIA systems of all countries. These can be divided into:

- non-binding instruments, such as the Rio Declaration, that establish important principles for sustainable development, including those which need to be reflected in EIA arrangements (e.g. the application of the precautionary principle);
- legal conventions and treaties related to environmental protection at the global or regional level, which carry obligations for signatory countries that may be met through EIA arrangements; and

- legal conventions and protocols that apply specifically to EIA arrangements – of which the Espoo Convention is the most notable example.

A number of international environmental agreements establish substantive obligations on the countries that ratify them (see Annex 1). The Conventions on Climate Change and Biological Change are flagship agreements because of their global scope, the importance of the issues that are addressed and their ratification by a large number of countries. EIA is specified as a mechanism for implementing certain aspects of both agreements. More generally, it can ensure that the proposed actions of signatory countries are in compliance with these and other international environmental agreements, including those listed in Annex 1.

The UNECE (Espoo) *Convention on EIA in a Transboundary Context* (adopted in 1991 and entered into force in 1997) is the first multi-lateral EIA treaty. It stipulates the responsibilities of signatory countries with regard to proposals that have transboundary impacts, describes the principles, provisions and procedures to be followed, and lists the activities, content of documentation and criteria of significance that apply. At present, the signatories of the Convention are from the UNECE region and include many Central and Eastern European countries in transition. In this region, the Convention has had an important role in strengthening EIA arrangements.

EIA requirements of the World Bank and regional development banks*

**African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, Inter-American Development Bank*

The World Bank and the regional development banks listed above now have well-established EIA procedures, which apply to their lending activities and projects undertaken by borrowing countries. Although their operational policies and requirements vary in certain respects, the development banks follow a relatively standard procedure for the preparation and approval of an EIA report. This procedure generally follows the stages outlined in the flow chart shown on the verso of the topic divider. Borrowing countries are responsible for the preparation of the EIA, and this requirement possibly more than any other has influenced the introduction and development of EIA in many developing countries.

The EIA policies and arrangements of the development banks remain important, especially in countries that have weak or non-existent domestic arrangements. Recently, the World Bank has made a number of changes to make the application of its EIA procedure more systematic, notably through its linkage to new environmental and social safeguard policies. In addition, the Bank's broader environmental policy has moved from a 'do no harm' approach to minimise the adverse effects of its projects to the use of SEA as part of a strategy of promoting long-term sustainability (see Box 3).

Box 3: The World Bank environmental agenda

The Bank's environmental agenda is evolving from a 'do no harm' policy to one of promoting environmental sustainability and integrating environment into sector programmes and macro policies.

- **Do-No-Harm** To mitigate the potential adverse effects of the Bank's investment projects on the environment and vulnerable populations, EIA procedures and safeguard policies are applied. In many cases, these have contributed to better project design and environmental management plans have helped to improve project implementation.
- **Targeted Environmental Assistance** To foster long-term environmental sustainability and improve conditions in developing countries, designated Bank projects target the following areas: sustainable natural resource management, including watershed protection and biodiversity conservation; pollution management and urban environmental improvements; environmental institution and capacity building, and global environmental actions, in accordance with international environmental conventions and commitments.
- **'Mainstreaming' the Environment at the Level of Policy and Programmes** To integrate environmental concerns at the macro level, the Bank has reviewed the policies of the energy, rural development and other sectors, established an environmental framework for its country assistance strategies and intends to make greater use of SEA at the programme and regional level.

Source: World Bank (1999: 8-10)

Review the guidelines that apply or could be used to implement the provisions and requirements of the EIA system. Discuss the problems that can be caused by the lack of coherence in the EIA procedures established by international agencies. Note the OECD framework to ensure coherence of EIA requirements when more than one donor system applies.

Many countries provide various types of guidance on how to apply their EIA procedure. Where the guidance is official, it is usually prepared by the overseeing authority to ensure compliance with EIA requirements. This material is aimed primarily at the proponent, government agencies and others with designated responsibility for implementation of EIA arrangements. In certain countries, procedural guidance is oriented more toward promoting EIA good practice for key stages and activities of the process, such as screening and scoping.

When procedural guidance is not available, it may be developed by reference to guidelines prepared by other countries or international agencies.

There are many examples on which to draw. A useful starting point is the *IIED Directory of Impact Assessment Guidelines* (see references). It contains numerous entries organised by country, sector and agency, and includes guidelines issued by development banks, bilateral-donor, inter-governmental and UN organisations. (More specialised guidance on appropriate EIA methodology, and applications to particular types of projects and areas can be found in the World Bank's *Environmental Assessment Sourcebook*).

In many jurisdictions, more than one set of EIA procedures may apply to a proposal. The lack of coherence between the EIA requirements of various governments or agencies can lead to uncertainty, confusion and added expense for proponents. Problems commonly occur when:

- countries receive aid from a number of donors, each having its own prescribed assessment process; or
- a proposal is transboundary in nature, requiring compliance with EIA procedures in two or more countries, states or levels of government (see Espoo Convention above).

The problems of coherence of EIA for international bilateral aid were addressed by the Working Party of the Development Assistance Committee of the OECD. A practical guide on this subject was prepared to aid both officials in bilateral donor agencies and their counterparts in developing countries. It summarises the various EIA procedures used by the different agencies and provides two key means of promoting coherence:

- a framework Terms of Reference for the EIA of development assistance projects; and
- a comprehensive checklist for managing EIA.

Outline the legal, policy and institutional arrangements that provide the foundation for an effective national EIA system. Note other features that are important to support their application. Ask the participants about any implications these may have for EIA locally and if they can identify any other factors that may be relevant.

Experience in many countries indicates that the foundations of an effective EIA system are established by the following arrangements:

- explicit basis in law and regulation;
- clear statement of objective(s) and requirement(s);
- mandatory compliance and enforcement;
- comprehensive scope of application to proposals with potentially significant impacts;
- prescribed process of steps and activities;
- provision for public consultation and access to information; and
- linkage to project authorisation, permitting and condition setting.



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In terms of legal provision, aspects of specific importance include:

- broad definition of the environment and 'effects';
- duty to avoid, mitigate or remedy adverse effects arising from an activity;
- requirement for an EIA report to specify mitigation measures the proponent intends to apply;
- procedural guidance on compliance and good practice in applying EIA arrangements; and
- giving reasons for decisions on proposals subject to EIA.

These components can be used to evaluate how current EIA systems measure up against accepted standards for law, policy and institutional arrangements. Where these pre-requisites are in place, they do not guarantee, in themselves, good EIA practice and effective performance. Other factors may intervene. However, where the basic arrangements are inadequate, then the EIA process is very unlikely to lead in the direction of good outcomes.

In developing countries experience has shown a number of underlying conditions will determine whether and how an EIA system is instituted. These are interrelated and reinforcing, and include:

- a functional legal regime;
- sound administration and flexible policy-making;
- stakeholder understanding of the aims of the process and its potential benefits;
- political commitment;
- institutional capacity for implementation;
- adequate technical capacity, data and information;
- public involvement; and
- financial capacity

Legislation should make clear and explicit provision for the EIA process and identify the responsibilities of the various participants. It needs to be framed specifically to achieve the goals or outcomes that have been identified and incorporate provision for periodic review (to allow for the lessons of experience, changing societal expectations and new demands). A functional legal system is needed if EIA legislation is to be implemented effectively.

Sound administration and flexible policy-making

The legal and institutional arrangements for EIA need to be implemented fairly, consistently and efficiently. EIA policy should be developed flexibly and its effectiveness monitored, giving particular attention to the following factors:

- the reasons for introducing EIA and the problems that it is meant to resolve;



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- the goals of the EIA process and how their achievement can be measured;
- the most appropriate approaches to implementing, enforcing and monitoring the outcomes of the EIA process; and
- mechanisms for reviewing and adapting the EIA process to ensure that it continues to meet needs.

Stakeholder perception of the aims and benefits of the process

It is important for all stakeholders to have a realistic understanding of the role that EIA is intended to play in development approvals. Also, in order to ensure continued support for the EIA process, its benefits need to be explicitly recognised and acknowledged, and if necessary, action taken to add value (see above).

Political commitment

The EIA process cannot succeed in its aims without political commitment, public support and adequate resources. Poorer developing countries with weak economies and/or unstable political conditions might need to gradually introduce or strengthen their EIA systems.

Institutional capacity

The successful operation of an EIA system requires the responsible institutions to have the capability to carry out the key functions and activities. Otherwise, even if EIA legislation is in place, its potential benefits will not be delivered. Even where institutional capacity is sufficient, particular care may need to be taken to facilitate good communication, coordination and co-operation between the various government departments responsible for development and environmental management.

Technical capacity, data and information

In particular, the successful operation of the EIA system depends upon the availability of qualified people with the technical skills and expertise to carry out the research, analysis and preparation of an EIA report to the level necessary to inform decision-making. The quality of technical work also reflects upon the availability of baseline data and information on the natural environment, and the research and education system that is in place in a particular country.

Public involvement

Although attention to technical matters is essential, public involvement is crucial to identifying the issues and information that may be of importance in EIA. Local knowledge also may be of considerable benefit to the development and viability of a project. Many projects have failed because

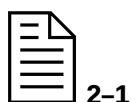
they did not take into account local or traditional factors or because they failed to gain public acceptance and support.

Financial support

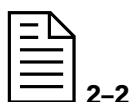
Part of the political commitment to the EIA process is the provision of adequate funds to administer the process and carry out required activities. Where necessary, this commitment should include funds for EIA capacity building and training. Often, too, there is a need to provide funding for public involvement programmes, especially in cases where major projects result in involuntary resettlement or other types of social dislocation.

Generally, the need for these programmes is greatest where financial resources are scarcest. Realistically, in many cases progress will be limited without international assistance. In the long term, adequate funding will depend upon the recognition of the benefits that the EIA process brings to a country. These benefits need to be recorded (such as in case studies) so that they are available for later use.

Summarise the key factors to be considered, and the steps involved, when establishing or modifying a national EIA process. Ask if any of the participants have experience in this area that they could share with the group.



2-1



2-2

The UN Economic Commission for Europe (UNECE) has developed a number of guidelines related to the provision of legal, policy and institutional arrangements in the EIA systems of member countries (See Handout 2-1). If appropriate, review or provide a copy of these to the participants and adapt or add to them to meet the needs of the local situation. Criteria for choosing and customising an EIA system to suit are contained in Handout 2-2.

Getting ready

The development or modification of a country's EIA procedures requires:

- gaining the support of government;
- establishing the pre-conditions noted in the previous section;
- understanding other planning and regulatory processes and their relationship with the EIA system so as to avoid duplication of requirements and functions;
- consideration of the relative strengths and weaknesses of legal, policy and institutional arrangements;
- identification of appropriate means of implementing them; and
- taking account of key trends and directions for EIA development and their relevance to the political, social and economic circumstances.



9



10

Steps towards establishing an EIA system

A number of steps can be taken in adopting or adapting a national EIA system to meet the needs of a particular country, including the following:

- establish the goals and objectives of the EIA process;
- review EIA systems established in neighbouring and other countries, especially those that are similar in nature and level of development;
- identify, and cater for, international obligations and commitments such as those arising from ratifying the Conventions on Biological Diversity and Climate Change;
- learn from the experience of others (consider international reviews such as the effectiveness study but also look for regional examples);
- incorporate features that will facilitate the move towards sustainability;
- identify appropriate standards and procedures;
- develop trial guidelines to test the system in practice;
- draft or revise the legislation necessary to implement the necessary changes; and
- incorporate measures to appropriately monitor and review the EIA process to ensure that it is working as intended, and, where necessary, adapt it to meet new requirements and needs of the country.

Experience with the operation of EIA systems has generated a number of 'rules of thumb' that may be generally applicable or useful when adopting or adapting legal, policy and institutional arrangements. Do they apply in the local situation? Do the participants have any others to offer the group? Use OHP 11 to record local 'rules of thumb'.



11

Developing 'Rules of Thumb'

Consider the following in developing the list:

- Without a clear legal and institutional framework, EIA is *ad hoc* and the benefits are lost or reduced.
- EIA relies on and is assisted by other environmental policy and regulatory systems which set objectives and standards (e.g. for ambient air quality, emission and discharge limits etc.).
- Other EIA systems always need to be adapted to the 'political culture' of a specific country, particularly in the area of public involvement.
- EIA should apply equally to private and publicly funded projects; their environmental significance is what matters.
- In order to achieve maximum effectiveness, the EIA process should be integrated with the project cycle at the earliest pre-feasibility stage.
- A quick start up to gain 'hands on' experience with EIA arrangements is usually preferable to lengthy preparatory studies.

- This approach will pay most dividends when it is part of an explicit attempt to 'learn and adapt as you go'.
- Even though institutional capability may be at an early stage, EIA can still lead to substantial benefits in the form of better environmental protection.
- When proponents, the government and the public are experienced in the process they are more likely to have realistic expectations of the process and its outcomes.

Include a training activity to reinforce the topic (if desired).

Summarise the presentation, emphasising those key aspects of the topic that apply locally.

Reference list

The following references have been quoted directly, adapted or used as a primary source for major parts of this topic.

Donnelly A, Dalal-Clayton B and Hughes R (1998) *A Directory of Impact Assessment Guidelines, (Second Edition)*. International Institute for Environment and Development (IIED). Russell Press, Nottingham, UK.

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Further reading

Petts J (1999) (ed) *Handbook of Environmental Impact Assessment Volume 2: Environmental Impact Assessment in Practice: Impact and Limitations*. Blackwell Science Ltd. Oxford, UK.

The following chapters provide information on EIA law, policy and institutional arrangements that are applied internationally and in particular regions of the world.

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institutional
arrangements

References and further reading

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- Briffett C Environmental Impact Assessment in East Asia (pp. 143-167).
- Brito E and Verocai I Environmental Impact Assessment in South and Central America (pp. 183-202).
- Clark R and Richards D Environmental Impact Assessment in North America (pp. 203-222).
- Kennedy W Environmental Impact Assessment and Multilateral Financial Institutions (pp. 97-120).
- Kokange J Environmental Impact Assessment in Africa (pp. 168-182).
- Rzseszot U Environmental Impact Assessment in Central and Eastern Europe (pp.123-142)
- Schrage W The Convention on Environmental Impact Assessment in a Transboundary Context (pp.85-97).
- Wood C Comparative Evaluation of Environmental Impact Assessment Systems (pp. 10-34).

Annex 1: International environmental agreements relevant to the application of EIA

Key agreements are listed below. They are divided into two broad categories (the so-called green and brown lists). Emphasis is given to those agreements that apply worldwide and primarily cover issues related to the management of the 'global commons' or transboundary environmental impacts, which can be addressed only if countries adopt commonly agreed principles and rules of action.

Agreements related to the Conservation of Nature and Biological Diversity (the Green List)

- *Convention on Biological Diversity* (Rio de Janeiro 1992, entered into force in 1993) promotes conservation of biological diversity and sustainable use of its components.
- *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (Washington 1973, entered into force in 1975) prohibits or regulates commercial trade of listed species.
- *Convention on Wetlands of International Importance Especially in Waterfowl Habitat* (Ramsar 1971, entered into force 1973) aims to prevent loss and encourage wise use of wetlands. Signatory Countries are required to designate at least one site to the Ramsar list.

Agreements related to the Control and Prevention of Pollution (the Brown List)

- *Framework Convention on Climate Change* (New York 1992, entered into force 1994) aims to stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent 'dangerous interference with climate'.
- *Convention for the Protection of the Ozone Layer* (Vienna 1985, entered into force 1988) including *the Protocol on Substances that Deplete the ozone layer* (Montreal 1995) aims to reduce and eliminate emissions of specified ozone-depleting substances and control other harmful activities.
- *Convention on Control of Transboundary Movements of Hazardous Wastes and Their Disposal* (Basel 1989, entered into force in 1992) aims to control and reduce transboundary movements of hazardous wastes, and assist developing countries in environmentally sound management of the hazardous and other wastes they generate.

Source: World Bank (1996)

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

- 2-1 What would be the most effective way of introducing or strengthening a national EIA system? How should this be related to other processes such as those for permitting discharges, land-use planning etc?
- 2-2 How should EIA be administered if the full potential of the process is to be achieved?
- 2-3 What are the advantages and disadvantages of using discretionary versus prescriptive procedures for the various stages of the EIA process?
- 2-4 How can EIA be extended to address policies, plans and programmes?
- 2-5 What other strategies could be used to improve the consideration of environmental factors in decision-making?
- 2-6 How could the local EIA process be adapted to encourage the consideration of cumulative and large-scale impacts? What information or other resources might be needed to implement these improvements?
- 2-7 What are the main challenges in implementing an environmental policy or strategy for assuring the sustainability of development?

Speaker themes

- 2-1 Invite a speaker to discuss the harmonisation of EIA frameworks of the donors involved in development.
 - 2-2 Invite a speaker who has been involved in the successful implementation of EIA procedures locally or under similar conditions to discuss how this was done.
 - 2-3 Invite a speaker to outline the way in which strategic environmental assessment is or could be used to establish the context for project EIA.
-



1 – 3

*Identical to 1–10**Identical to 1–1 and 1–2*

4

Key EIA trends as identified by the Effectiveness Study

- more systematic procedures for EIA implementation
- greater consideration of biophysical, social, risk, health and other impacts;
- extended temporal and spatial frameworks
- provision for SEA of policy, plans and/or programmes
- incorporation of sustainability perspectives and principles
- linkage to other planning, regulatory and management regimes



5

Milestones and points of reference for EIA arrangements

- Rio Declaration on Environment and Development
- UN Conventions on Climate Change and Biological Diversity
- EIA procedures of development banks and donor agencies
- European Directive on EIA (and proposed Directive on SEA)



6

Types and examples of EIA legal provision

- general environmental law (e.g. NEPA)
- comprehensive resource management and planning law (e.g. New Zealand RMA)
- enabling or framework EIA law (e.g. European Directive)
- comprehensive or prescriptive EIA law (e.g. CAEE)



7

Legal and institutional cornerstones of an EIA system

- based on legislation
- clear statement of purpose and requirements
- mandatory compliance and enforcement
- application to proposals with potentially significant impacts
- prescribed process of steps and activities
- provision for public consultation
- linkage to decision- making



8

Basic conditions supporting an EIA system

- functional legal regime
- sound administration and flexible policy-making
- common understanding of the aims and potential benefits of the process
- political commitment
- institutional capacity
- adequate technical basis, data and information
- public involvement
- financial support



9

Developing EIA procedures requires:

- government support
- establishing the basic conditions
- understanding the relationship to other decision-making processes
- consideration of the effectiveness of different EIA arrangements
- identification of the ways in which they can be implemented
- taking account of key trends and directions for EIA



10

Steps to developing an EIA system

- establish goals
- review other EIA systems
- identify obligations under Treaties
- learn from the experience of others
- incorporate features to move towards sustainability
- identify procedures and standards
- develop trial guidelines
- produce legislation
- incorporate processes for monitoring and review



11

EIA Systems – 'Local Rules of Thumb'

Principles for the Implementation of Environmental Impact Assessment

The Economic Commission for Europe (ECE) has made a number of recommendations to ECE governments for establishing EIA procedures.

Principles for the Implementation of Environmental Impact Assessment

It is recommended that:

1. Priority should be accorded to the implementation of EIA through legislation, which should:
 - (a) In the case of separate legislation, provide for linkage with other legislation which, *inter alia*, governs land-use planning and planning in different economic sectors, licensing and permit systems and environmental management;
 - (b) Provide for the analysis and evaluation of possible environmental impacts (including health impacts) of activities before a decision is taken, as well as in the construction and operation phases;
 - (c) Contain provisions to promote the integration of environmental considerations into planning and decision-making processes;
 - (d) Promote integrated environmental management in relation to sustainable economic development; and
 - (e) Allow for the necessary resources to be allocated to the EIA process.
2. Existing legislation and practices should be examined to ensure that EIA is fully integrated into decision-making, so that a comprehensive environmental management approach can be implemented.
3. EIA should, in principle, be applicable to a wide range of activities including urban development, agricultural and industrial development (including retrofitting into old technology) and energy generation and transportation, the development and operation of physical infrastructures, natural resources exploitation, treatment, storage and disposal of waste.
4. There should be more harmonisation of EIA practices, at the national and international levels to unify terminology, *inter alia* through the development of a list of terms, to facilitate mutual understanding and to enable the undertaking of EIA in a transboundary context.
5. In each country, an authority should be identified to introduce and oversee the administration of national EIA programmes.
6. An EIA process should provide for:
 - (a) A clearly defined application of the process to certain activities and to specific levels of decision-making;
 - (b) Scoping procedures;
 - (c) Procedures for independent review;
 - (d) Public participation opportunities;
 - (e) Identification of mitigation measures;
 - (f) A linkage with decision-making including a record of decision(s);
 - (g) Post-project analysis and monitoring; and
 - (h) Institutional and organizational requirements.
7. For the sake of effectiveness and the optimum allocation of financial and human resources, EIA should particularly be applied where anticipated activities are likely to cause significant environmental impacts, in particular those with a long-term or irreversible character. Mechanisms for identification should be used, such as the enumeration of activities subject to EIA (based on, *inter alia*, sensitive ecosystems, vulnerable resources, non-renewable resources, specific criteria and threshold levels, or combinations of these methods) or initial environmental evaluation procedures.
8. EIA legislation should apply to individual projects and could allow for application to regional development schemes and programmes as well as general policies and strategies.
9. Depending on the nature and degree of the assessed impacts, EIA should continue during the construction, operational and decommissioning phases of activities in order to:

Principles for the Implementation of Environmental Impact Assessment

- (a) Monitor compliance with the agreed conditions set out in construction permits and operating licences;
 - (b) Review environmental impacts for the proper management of risks and uncertainties;
 - (c) Modify the activity or develop mitigation measures in case of unpredicted harmful effects on the environment;
 - (d) Verify past predictions in order to transfer this experience to future activities of the same type.
10. Procedural arrangements ('scoping') should be adopted to determine the issues to be examined, as well as to develop and to select reasonable alternatives to proposed activities.
11. Scoping processes should be undertaken early in EIA by involving and consulting all parties concerned in order to avoid unnecessary cost and delay, and to accommodate early on the conflicting interests of parties involved.
12. The EIA documentation should undergo an independent review to control the quality and adequacy of the information prior to the decision being made.
13. Review procedures should be defined in relevant legal provisions, regulations or other appropriate arrangements, and be undertaken by an interdisciplinary team with the relevant expertise, in order to assure the preparation of well-balanced and complete results, to enhance the acceptability of the outcome and to improve the management of uncertainties and risks in EIA.
14. EIA procedures should allow for the direct involvement of the affected public, individuals, groups and organizations early on in the EIA process, as they can make important contributions to the identification of objectives, impacts and alternatives.
15. Programmes should be developed as early as possible in the EIA process in order to inform the public of planned activities through direct notification and the use of mass media such as newspapers, television and radio.
16. Efforts should be increased to develop or improve:
- (a) Integrated monitoring programmes;
 - (b) Methods and programmes for the collection, analysis, storage and timely dissemination of directly comparable data regarding environmental quality in order to provide an input to EIA.
17. In order to improve the efficiency of EIA and to obtain a better understanding of its cost-effectiveness, information should be collected to determine the benefits and costs of EIA as a tool for both planning and environmental protection as well as for the integration of environmental values into the decision-making process.
18. When applicable, the consideration of alternatives should take into account different activities, options in technology, process, operation, location, mitigation and compensation measures as well as production and consumption patterns.
19. Appropriate measures should be promoted that allow for and facilitate the assessment of environmental impacts from new technological developments in all economic sectors; to this effect regulations, guidelines and criteria should be developed in order to apply the principles of EIA to technological innovations.
20. EIA documentation should contain, as a minimum:
- (a) The setting of the activity (purpose and need);
 - (b) Which authority(ies) is (are) required to act upon the documentation, and the nature of the decision(s);
 - (c) Description of the activity itself and reasonable alternatives to it, if appropriate, including the do-nothing alternative;
 - (d) The potential environmental impacts and their significance attributable to the activity and its alternatives as well as the socio-economic consequences of environmental change owing to the activity or its alternatives;
 - (e) The relevant environmental data used and, for reasons of clarity, an explicit indication of predictive methods and underlying assumptions made during the assessment procedure;

Principles for the Implementation of Environmental Impact Assessment

- (f) The identification of gaps in knowledge and uncertainties which were encountered in compiling the required information;
- (g) An outline of monitoring and management programmes and mitigation measures to keep environmental degradation at a minimum; and
- (h) A non-technical summary including a visual presentation (maps, graphs, etc).

21. Special consideration should be given to the setting up or intensification of specific research programmes aimed at:

- (a) Improving existing qualitative and quantitative methods for assessing the environmental impacts of proposed activities;
- (b) A better understanding of cause-effect relationships and their role in integrated environmental management;
- (c) Analysing and monitoring the efficient implementation of such decisions with the intention of minimising or preventing impacts on the environment (post-project analysis);
- (d) The development of methods to stimulate creative approaches in the search for environmentally sound alternatives to planned activities, production and consumption patterns;
- (e) The development of methodologies for the application of the principles of EIA at the macro-economic level. The results of the programmes listed above should be exchanged at the international level.

22. Education and training should be regarded as an important tool to improve the practical application and implementation of EIA:

- (a) For managers (both proponents and competent authorities);
- (b) For practitioners; and
- (c) For students (at universities and other appropriate higher schools).

Managers and practitioners should be provided with additional training. For students, curricula should include the concept of the integrated approach of EIA. Governments should exchange information on planned EIA training courses.

23. Co-operation in the field of EIA in a transboundary context is necessary and should be developed and intensified among countries concerned, taking into account national sovereignty over natural resources, to enable:

- (a) The provision of information, notification and consultation as early as possible in the EIA process and prior to decisions being taken on planned activities with potentially significant environmental effects on other countries;
- (b) The exchange of relevant environmental data and information on the planned activities and their possible transboundary effects;
- (c) Public participation in the affected areas based on the principles of reciprocity and non-discrimination;
- (d) When appropriate, the provision of a mechanism for independent review which may involve a joint commission, joint monitoring and preparation of assessment documentation, implementation of mutually agreed mitigation measures and means to incorporate the views of the affected country(ies) into the decision-making process.

24. Governments should incorporate EIA provisions in existing and new bilateral or multilateral treaties or agreements with potential environmental implications.

(From ECE, 1991)

Criteria for choice of EIA process

Criteria for choice of EIA process

Effectiveness criteria, involving the likelihood of the EIA procedures achieving their stated goals:

Information. The availability of a sufficient information base to allow effective design and implementation (impinges on all other criteria).

Dependability. The extent to which one can be sure that the EIA procedures will achieve the desired outcome or specified goal under existing conditions.

Timing. The time required for the EIA procedures to take effect, in relation to the time perceived available for redressing the problems.

Adaptability. The ability of the EIA procedures to be applied in the face of heterogeneity within one time period.

Flexibility. The degree to which the EIA procedures will continue to be effective, or will require modification, in the face of changing social or economic circumstances.

Cost. The gross demand on economic resources for implementation of the EIA procedures.

Efficiency. The EIA procedures that can realise the policy goal for the least possible cost. Efficiency is differentiated from cost by the consideration of the achievement of the policy goal, thus moving beyond simple expense.

Cross-sectoral influence. The potential for the EIA procedures to offer other benefits (economic efficiency, equity, human health, etc) aside from the achievement of the environmental policy goal. Conversely, the degree of surety that the EIA procedures do not entail a risk of disbenefits in such terms.

Implementation criteria, involving the likelihood of being able to implement the favoured EIA procedures in the relevant social and institutional operating environment.

Equity. The distributional implications; who bears what costs associated with the changes brought about by the application of the EIA procedures.

Political feasibility. The likelihood that the EIA procedures will be acceptable to major political/interest groups and the wider electorate.

Institutional feasibility. The ability of the existing of realistically envisaged institutional arrangements to implement the EIA procedures.

Monitoring. Whether monitoring the impact and use of the EIA procedures over time is feasible and/or affordable.

Enforcement/availability. Consequent on monitoring, whether adherence can be enforced if that is necessary and/or appropriate.

Communicability. Can the particular details of the EIA procedure, and the reasons for its use, be adequately communicated to those involved in its implementation or upon whom it will impact.

(Adapted from Dovers, 1995)

Topic 3

Public involvement

Introduction

Checklist

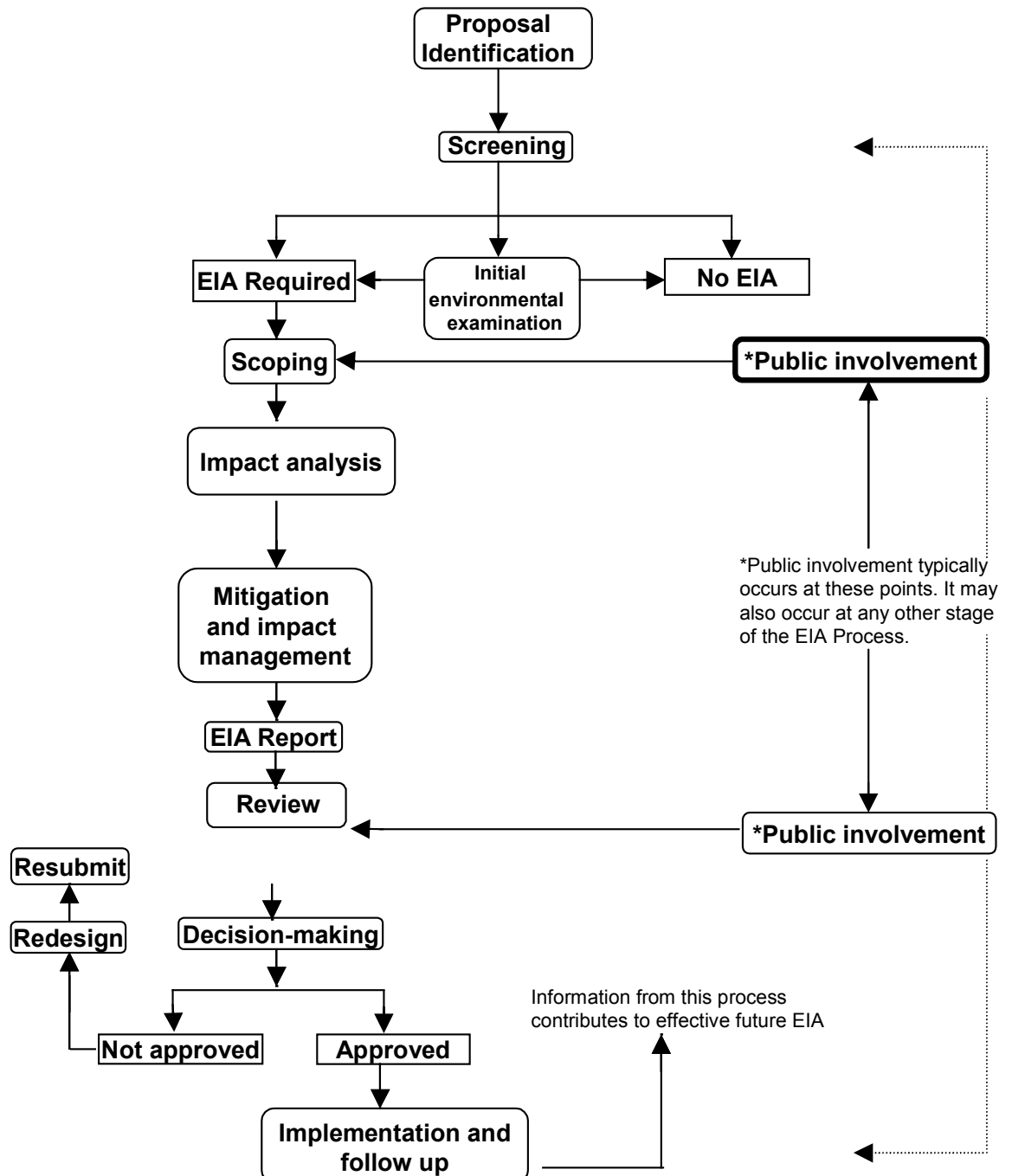
Session outline

Reference list and further reading

Training activities

Support materials

Public involvement in the EIA process



Topic 3—Public involvement

Objectives

To understand the role, scope and contribution of public involvement in the EIA and decision-making processes.

To recognise the options by which the public can be involved at different stages of the EIA process.

To identify the principles and requirements for meaningful consultation with stakeholders and the tools and techniques that can be used for this purpose.

Relevance

Public involvement is a fundamental principle of EIA. The inclusion of the views of the affected and interested public helps to ensure the decision making process is equitable and fair and leads to more informed choice and better environmental outcomes.

Timing

Three to four 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.



Information checklist

Obtain or develop the following, as appropriate:

- ☐ sections of EIA legislation and procedure that make provision for public involvement;
- ☐ any guidance relevant to the application of public involvement locally;
- ☐ examples of involvement techniques that have been used or are relevant locally;
- ☐ case examples of public involvement programmes which demonstrate good and bad practice;
- ☐ estimates of the resources necessary to support a public involvement programme, in terms of time, people and money;
- ☐ examples of comments and submissions by the public on EIA studies and reports;
- ☐ other supporting documentation or research on public involvement;
- ☐ contact names and telephone numbers of people, agencies, organisations and environmental information/data centres able to provide assistance in relation to public involvement; and
- ☐ other resources that may be available such as videos, journal articles, computer programmes, lists of speakers, and case studies.

Session outline

Briefly introduce the role and contribution of public involvement in the EIA and decision-making processes and note the different levels and types of approach. Ask the participants to consider why public involvement is important locally.

Public involvement is a fundamental principle of the EIA process. Timely, well planned and appropriately implemented public involvement programmes 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 robust, characterised 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.

Discuss the objectives and benefits of public involvement and consider how they apply to local situations.



1

The purpose 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.

The key objectives of public involvement are to:

- obtain local and traditional knowledge that may be useful for decision-making;
- facilitate consideration of alternatives, mitigation measures and trade-offs;

- ensure that important impacts are not overlooked and benefits are maximised;
- reduce conflict through the early identification of contentious 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.

Experience indicates that public involvement in the EIA process can and does meet these aims and objectives. Many benefits are concrete such as improvements to project design (see Box 1). Other benefits are intangible and incidental and flow from taking part in the process. For example, as participants see their ideas are helping to improve proposals, they gain confidence and self-esteem by exchanging ideas and information with others who have different values and views.

Box 1: Examples of the contribution of public involvement to project design

Ghana Environmental Resource Management Project

This project seeks to improve natural resource management. Public consultations drove the entire project design process from the very beginning. Investments under the village-level land and water resource management component were entirely designed by the local communities, which diagnosed problems, developed action plans and are now responsible for implementation. A coastal wetlands component was also largely designed through local consultation. Affected communities and user groups participated in the demarcation of ecologically sensitive areas and in determining the levels of resource use and conservation in coastal wetlands.

Brasil Espirito Santo Water Project

The original design would have had a negative impact on two communities. By including these communities in the EIA process through information disclosure and consultation, satisfactory mitigation measures were achieved that counterbalanced the impacts and improved local living conditions.

Adapted from The World Bank (1995)

Discuss briefly the different terms and definitions that are used when referring to public involvement. Consider the relative advantages and disadvantages of different types and levels of public involvement.

Key terms and definitions of public involvement are described in Box 2. The basic types of public involvement are organised as a 'ladder' of steps of increasing intensity and interaction. When reviewing them, note their



2

different requirements with regard to planning and designing a public involvement programme.

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. *Consultation* denotes an exchange of information designed to canvass the views of stakeholders on a proposal and its impacts. *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. *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.

Box 2: Levels and forms of public 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; and
- **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)

Consider who should be involved in the EIA process. Ask the participants to identify which parties might have a stakeholder interest in being involved in an EIA and why they might wish to be involved.

The range of stakeholders involved in an EIA typically includes:

- the 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 programme 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 solicited 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 Table 1. However, these benefits may not be always realised 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.

Table 1: The benefits of effective 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
Legitimises 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).



3

Discuss how the people and groups who should be involved in a particular EIA can be identified. Ask participants to consider their application to the local situation.

People who may be directly or indirectly affected by a proposal will be a focus for public involvement. First and foremost are the individuals and groups who are likely to be directly and adversely affected. Usually, their identification is relatively straightforward. The intended beneficiaries of the proposal are often more difficult to identify because the benefits of the proposal may be generalised across a large population (which may be regional or national). In some cases, the interest of beneficiaries may be represented by government agencies, private sector groups and NGOs, which support the proposal on economic and social grounds.

A variety of other individuals and groups may be indirectly affected by a proposal or have some interest in its outcome. Often, the representation of the interests of indirectly affected parties will coincide with those of other stakeholders, such as local community, private sector and environmental organisations. However, this relationship cannot be assumed automatically. For example, certain major projects may affect such an extensive area that identifying a representative and manageable range of participants is difficult. In such cases, it may be helpful to systematically 'map' the stakeholders and differentiate among their interests.

Every effort should be made to seek a fair and balanced representation of views. Often, an inclusive approach to public involvement is taken. A common rule of thumb is to include any person or group who expresses an interest in the proposal. However, particular attention should be given to those 'at risk' from the impact of a proposal. World Bank guidance indicates this group should have the most active involvement.

Briefly review the provisions made for public involvement in the EIA system of a given country or an international development agency. Ask the group to consider any requirements of applicable international legal and policy instruments and the precedents set by the Aarhus Convention.

Most EIA systems make some type of provision for public involvement. The legal and procedural requirements for this purpose vary. In developing countries, the EIA procedure established by the development banks will take precedence for projects carried out with their assistance. All of the major development banks consult the public during the EIA process carried out on their operations.

Their specific requirements differ regarding timing and scope of consultation and the type and amount of information disclosed.

For example, World Bank Operational Policy (4.01) specifies that consultation with affected communities is a key to the identification of impacts and the design of mitigation measures. It strongly recommends consultation with affected groups and NGOs during at least the scoping and EIA review stage (see below). In projects with major social components, such as those requiring voluntary resettlement or affecting indigenous peoples, the process should involve active public participation in the EIA and project development process.

The provision made for public involvement should be consistent with principles established by international law and policy (see Box 3). The most comprehensive treaty in this regard is the Aarhus Convention, although this applies only to UNECE countries and only entered into force in 2001 (by ratification by a sufficient number of signatory countries). However, it is likely to set important new precedents for standards of public involvement. Key principles for public involvement, which are widely agreed, are outlined in Box 4.

Box 3: Reference to public participation in international law and the Aarhus Convention

Reference to public participation is made in a number of international legal instruments including:

- *UNECE Convention on Environmental Impact Assessment in a Transboundary Context* (Espoo, 1991) which provides for the participation of the public in the areas likely to be affected by a proposal (article 2, paras 2 and 6, and article 4, para 2);
- the *Framework Convention on Climate Change* (1992), which requires Parties to promote and facilitate public participation in addressing climate change and its effects and developing adequate responses (article 6 (a) (iii));
- *Principle 10 of the Rio Declaration on Environment and Development* (1992) which states that each individual shall have the opportunity to participate in decision-making processes, facilitated by the widespread availability of information; and
- *UNECE Convention on Access to Information, Public Participation in Decision Making and Access to Justice in International Environmental Matters (Aarhus)* (1998) is the most comprehensive legal instrument relating to public involvement. It describes how public participation should work in cases of decision-making. The main text indicates that public participation should be effective, adequate, formal, and provide for information, notification, dialogue, consideration and response.

Source: adapted from Stec and Casey-Lefkowitz (2000)



4

Box 4: Principles of public involvement

The process should be:

- 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
- credible – builds confidence and trust

Relate public involvement to the stages of the EIA process. Ask the group to consider whether and how these apply in a given EIA system. Develop their responses to show how public involvement can be used throughout the EIA process.



5

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

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 (see Topic 4 – *Screening*). 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.

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 (see Topic 5 – *Scoping*). They should also outline any specific requirements for public involvement in EIA preparation, review, and follow up.

Impact analysis and mitigation

The further involvement of the public in these phases of EIA preparation (see Topics 6 – *Impact analysis* and 7 – *Mitigation and impact management*) 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.

Review of EIA quality

A major opportunity for public involvement occurs when EIA reports are exhibited for comment (see Topics 8 – *Reporting* and 9 – *Review of EIA quality*). However, making written comments is daunting 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.

Implementation and follow up

The environmental impacts of major projects will be monitored during construction and operational start up, with corrective action taken where necessary (see Topic 11 – *Implementation and follow up*). Local representatives should scrutinise 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.

Public involvement in practice

In many EIA systems, public involvement centres on the scoping and review stages. This can be a response to procedural requirements or reflect accepted practice. More extended forms of public involvement occur when:

- proposals are formally referred to public review, hearings or inquiries;
- proposals seek to apply a 'best practice' process to their proposal;
- proposals depend upon gaining the consent or support of local stakeholders; and
- proposals have major social impacts and consequences, such as the relocation of displaced people.

Emphasise the importance of systematic, timely planning for a public involvement programme. Discuss different ways in which the programme, including the engagement of participants, could be funded.

Planning by the proponent for a public involvement programme needs to begin early before other EIA work. Following scoping, the terms of reference for an EIA study should include specifications for the proposed programme, including its scope, timing, techniques and resources. If there are none, a separate document should be prepared by the EIA project team with advice and input from a social scientist who is knowledgeable about the local community and participation techniques.

The plan should describe the means of notifying and informing the public about the proposals and the EIA process, beginning at an early stage and continuing with updates on the progress of the EIA study and feedback on community concerns. Specific reference should be made to the ways in which the public will be engaged, how their inputs (knowledge, values and concerns) will be taken into account and what resources (people and money) are available to assist their involvement. Wherever possible, meetings and inquiries should be held within the local community, especially if there are basic constraints on its involvement (see next section).

A systematic approach to planning a public involvement programme typically involves addressing the following key issues:

- *Who should be involved?* – identify the interested and affected public (stakeholders), noting any major constraints on their involvement.
- *What type and scope of public involvement is appropriate?* – ensure this is commensurate with the issues and objectives of EIA.
- *How should the public be involved?* – identify the techniques which are appropriate for this purpose.
- *When and where should opportunities for public involvement be provided* – establish a plan and schedule in relation to the EIA process and the number, type and distribution of stakeholders.
- *How will the results of public involvement be used in the EIA and decision-making processes?* – describe the mechanisms for analysing and taking account of public inputs and providing feeding back to stakeholders.
- *What resources are necessary or available to implement the public involvement programme?* – relate the above considerations to budgetary, time and staff requirements.

Briefly, review the underlying factors that may constrain public involvement. Ask the group whether or not they apply locally and, if so, how they could overcome them.



6

In certain cases, some basic constraints on public involvement may need to be overcome. Particular attention should be given to disadvantaged groups, ethnic minorities and others who may be inhibited from taking part or may have difficulty in voicing their concerns. Often, special provision may need to be made to inform and involve these groups. Except in unusual or extenuating circumstances, others should not speak for them, although knowledgeable NGOs may help in ensuring they represent their views directly and in a way that is meaningful to them.

Some of the underlying factors that may constrain meaningful public involvement include:



7

Poverty – involvement means time spent away from income-producing tasks, and favours the wealthy.

Remote and rural settings – increased or dispersed settlement distances make communication more difficult and expensive.

Illiteracy – involvement will not occur if print media is used.

Local values/culture – behavioural norms or cultural traditions can act as a barrier to public involvement or exclude those who do not want to disagree publicly with dominant groups.

Languages – in some countries a number of different languages or dialects may be spoken, making communication difficult.

Legal systems – may be in conflict with traditional systems and cause confusion about rights and responsibilities over resource use and access.

Interest groups – bring conflicting and divergent views and vested interests.

Confidentiality – may be important for the proponent, and may weigh against early involvement and consideration of alternatives.



3-1

Ask the group to identify some techniques and methods of public involvement and suggest where each of these could be most suitably used. List these techniques and provide participants with Handout 3-1. Work through the different techniques and their relative advantages.

Table 2 outlines some of the techniques that are commonly used for communicating and involving the public and illustrates their strengths and weaknesses in relation to key requirements and objectives (see Handout 3-1 for further information).

For example, various methods of public involvement can be rated in terms of the level of interaction promoted. However, it should not be inferred that methods with a high level of involvement are the preferred

approach – a mix of methods is usually necessary as part of a systematic process of public involvement.

The methods of public involvement should be tailored to suit the social environment and, wherever possible, targeted specifically at particular groups. Limitations and constraints (identified previously) should be taken into account. For instance, although people want to be consulted, they may not have the time, resources or ability to locate EIA information and report their views to the relevant authorities. Traditional local decision-making institutions and the use of the mass media (such as television, radio and papers) may be far more appropriate than placing reports in local libraries (which is the normal approach in a number of EIA systems).

When selecting public involvement techniques, the following points should be considered:

- the degree of interaction required between participants;
- the extent to which participants are able to influence decisions;
- the stage(s) of the EIA at which public involvement will occur;
- the time available for involvement;
- the likely number of participants and their interests;
- the complexity and controversy of the issues under consideration; and
- the consideration of cultural norms which may influence the content of discussions, for example relating to gender, religion, etc.

When using public involvement techniques, the following principles can help to achieve a successful outcome:

- provide sufficient, relevant information in a form that is easily understood by non-experts (without being simplistic or insulting);
- allow enough time for stakeholders to review, consider and respond to the information and its implications;
- provide appropriate means and opportunities for them to express their views;
- select venues and time events to encourage maximum attendance and a free exchange of views by all stakeholders (including those that may feel less confident about expressing their views); and
- respond to all questions, issues raised or comments made by stakeholders. This fosters public confidence and trust in the EIA process.



8

Table 2: Techniques for communicating with the public

Communication Characteristics				Public Information and Participation Objectives					
Level of Public Contact Achieved	Ability to Handle Specific Interest	Degree of 2-way Communication	Public Participation / Communication Techniques	Inform / Educate	Identify Problems / Values	Get Ideas / Solve Problems	Feedback	Evaluate	Resolve Conflict / Consensus
2	1	1	Public Hearings		X		X		
2	1	2	Public Meetings	X	X		X		
1	2	3	Informal Small Group Meetings	X	X	X	X	X	X
2	1	2	General Public Information Meetings	X					
1	2	2	Presentations to Community Organization	X	X		X		
1	3	3	Information Coordination Seminars	X			X		
1	2	1	Operating Field Offices		X	X	X	X	
1	3	3	Local Planning Visits		X		X	X	
2	2	1	Information Brochures and Pamphlets	X					
1	3	3	Field Trips and Site Visits	X	X				
3	1	2	Public Displays	X		X	X		
2	1	2	Model Demonstration Projects	X			X	X	X
3	1	1	Material for Mass Media	X					
1	3	2	Response to Public Inquiries	X					
3	1	1	Press Releases Inviting Comments	X			X		
1	3	1	Letter Requests for Comments			X	X		
1	3	3	Workshops		X	X	X	X	X
1	3	3	Advisory Committees		X	X	X	X	
1	3	3	Task Forces		X	X		X	
1	3	3	Employment of Community Residents		X	X			X
1	3	3	Community Interest Advocates			X		X	X
1	3	3	Ombudsman or Representative		X	X	X	X	X
2	3	1	Public Review of Initial Assessment Decision Document	X	X	X	X	X	X

Level of participation: 1 = low, 2 = medium, 3 = high.

Discuss consensus building and dispute resolution mechanisms and consider whether and how they may be applied locally.

Conflict management and dispute resolution approaches are beginning to be applied in a number of EIA processes. As recognised by the World Bank and other international agencies, the use of these approaches in developing countries must be consistent with local practices:

The objective is to define traditional mechanisms for making agreements, for negotiations, and for managing conflict in affected communities.

Understanding and working within cultural expectations and practices may enhance consultation and participation processes, especially in projects

where there are multiple and competing stakeholders or where disputes or conflict are evident. (*The World Bank, 1995*)

Negotiation, mediation and other alternative means of dispute resolution have different rules compared to more traditional 'open door' forms of public consultation and participation. These processes are carried out by a small number of representatives who are nominated by the major stakeholders (some of them may form coalitions for this purpose). Stakeholder dialogue is a more informal version of this process and focuses on sharing views and information to find win-win solutions to issues. As shown in Table 3, the approach differs in kind rather than degree from more traditional forms of public involvement.

However, there may be opportunities to reduce or resolve conflict in more traditional forms of public participation, providing all stakeholders are involved at the earliest stage of the proposal and sufficient time and appropriate opportunities are provided. A skilled facilitator may be able to assist stakeholders in finding common ground. In most cases, however, the range of interests and the different values of the participants will mean that consensus is unlikely. The focus of attention then should be on minimising the areas of dispute, and narrowing it to those key issues that cannot be resolved and leaving it to the decision-making process to arbitrate among the different positions (i.e. determining the 'winners' and 'losers').

Principles which will help minimise conflict, particularly if applied consistently from the earliest stages of the planning of the proposal, include:

- involving all those likely to be affected, or with a stake in the matter;
- communicating the need for and objectives of the proposal, and how it is planned to achieve them;
- actively listening to the concerns of affected people, and the interests which lie behind them;
- treating people honestly and fairly, establishing trust through a consistency of behaviour;
- being empathetic, putting yourself in the shoes of the other party, and looking at the area of dispute from their perspective;
- being flexible in the way alternatives are considered, and amending the proposal wherever possible to better suit the interests of other parties;
- when others' interests cannot be accommodated, mitigating impacts to the greatest extent possible and looking for ways to compensate for loss and damage;
- establishing and maintaining open two-way channels of communication throughout the planning and implementation phase; and
- acknowledging the concerns and suggestions of others, and providing feed-back on the way these matters have been addressed.



9

When conflict arises, try to defuse it at the earliest possible time. The use of an independent, mutually acceptable third party as the convenor of discussions between disputants can improve the chances of a satisfactory outcome. It is desirable for that third party to be trained in the principles of negotiation or mediation, and to be able to assist the parties in dealing with the feelings, facts and process issues associated with the dispute.

Table 3: Comparing the characteristics of ‘traditional consultation’ and ‘stakeholder dialogue’	
Traditional consultation tends to:	Stakeholder dialogue tends to:
Assume win/lose outcomes	Search actively for win/win results and ways to add value for all parties
Focus on differences and polarise rival positions	Explore shared and different interests, values, needs and fears, and build on common ground while trying to resolve specific disputes
Focus on issues and results	Focus on processes as well as issues and results in order to build long-term ownership of and commitment to mutually agreed solutions
Produce results that are perceived as inequitable, reflecting the traditional distribution of power and resources	Produce results which can be judged on their merits and which seem fair and reasonable to a broad spectrum of stakeholders
Stick to the facts and positions	Take into account, as well, feelings, values, perceptions, vulnerabilities
Ignore the importance of building relationships and bridging differences	Strengthen existing relationships and build new ones where they are most needed
Offer no learning	Invest in mutual learning as a starting point for future processes and projects
<i>Source: Ackland et al. (1999).</i>	

Many arguments are put forward to avoid public involvement. Discuss whether these misconceptions are accepted locally and how they may be countered.



10

Public involvement can be a time-consuming and costly exercise. This issue can be best addressed by sound planning. A proposal may be subject to delay and added expense if public consultation is non-existent or inadequate. Various arguments have been and still are advanced to justify avoiding public involvement. Some of the commonly used 'reasons' and answers follow:

It's too early; we haven't yet got a firm proposal	The early provision of information to the public will minimise the risk of untrue and damaging rumours about the proposals. Even though the proponent may not have a clear idea of project details, communicating the objectives of the proposals can start to build trust with the community, allow useful public input on site constraints and alternatives and can help the proponent devise a robust scheme.
It will take too long and will cost too much	Public involvement can be expensive and time-consuming. If integrated into the project planning process, excessive timelines can be avoided. The costs of not involving the public are likely to be even greater in terms of costs arising from delays.
It will stir up opposition, and the process will be taken over by activists	Those who are likely to oppose a project will not be dissuaded by the lack of a public involvement programme. Rather such a programme can ensure that all sides of the debate are heard. Importantly, the issues raised by opponents should be thoroughly examined and treated on their merits. If the impacts cannot be avoided, public involvement can help demonstrate that the concerns of all segments of the community have been fairly addressed.
We will only hear from the articulate	Those who are articulate, knowledgeable and powerful find it easier to use the opportunities provided through public involvement. Those preparing and managing such programmes must be aware of this, and incorporate measures to ensure that the views of 'the silent majority' are expressed and understood.
We'll raise expectations we can't satisfy	Great care must be taken in the first phases of a public involvement programme to ensure that unreasonable expectations are not raised. The purpose of public involvement in EIA and decision-making should be clearly communicated, together with decisions which have been made already.
The local community won't	Lack of technical education does not negate intelligence and the understanding people have of their own surroundings. Often people's knowledge of their

understand the environment and how it will be changed can be more
issues involved. accurate than that predicted by models.

Briefly conclude with a reference to the spirit of openness required by proponents if public involvement is to be beneficial.

No public involvement programme will be effective unless the proponent is serious in engaging with the community in a two-way dialogue and is open minded to what it can contribute to the proposal. Key prerequisites are a willingness to listen to the information, values and concerns of the community, to amend the proposal so as to minimise community concerns, and to acknowledge the value of community input.

Include a training activity to reinforce the topic (if desired).

Summarise the presentation, emphasising those key aspects of the topic that apply locally

Reference list

The following references have been quoted directly, adapted or used as a primary source for parts of this topic.

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Further reading

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Fisher R and Ury W (1981) *Getting to Yes: Negotiating Agreement Without Giving In*. Houghton Mifflin. Boston, Mass.

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Roberts R (1995) Public Involvement: From Consultation to Participation. In Vanclay F and Bronstein D (eds) *Environmental and Social Impact Assessment* (pp221-248). John Wiley & Sons, Chichester, UK.

World Bank (1995) *Environmental Assessment Challenges and Good Practice*. Paper No. 018. Environmental Management Series. Washington, D.C.

World Bank (1998) *Social Development Update: Making Development More Inclusive and Effective*. Social Development Paper. No.27. Washington, D.C.

Participatory Learning and Action Notes are issued by the International Institute for Environment and Development (IIED) to review themes and approaches to involving people in defining their needs and opportunities and taking action to realise them. The series has particular focus on the experience of developing countries. See also the website of the Resource Centre for Participatory Learning at: <http://www.rcpla.org/>

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

- 3-1 A large dam is proposed in a rural setting. What public involvement techniques might be used to support the EIA for the project? How would the approach change if the project concerns a major chemical plant in a large city?
- 3-2 How would you go about identifying the range of people affected directly or indirectly by a proposal? If necessary, how would representatives of the groups identified be selected?
- 3-3 What are the needs and interests of the affected community that make their involvement so important to them? Is their involvement as important for the proponent?
- 3-4 'Public involvement should take place at the scoping stage of a proposal, and when the EIA document is completed.' Does this statement satisfy the requirements for community involvement?
- 3-5 People feel more comfortable in familiar surroundings. Where should the venues and locations for discussions, small group meetings, public meetings and displays be located? How will the setting and other meeting arrangements contribute to the success of public involvement?
- 3-6 What are the objectives of public involvement? What value will it bring to the successful implementation of the proposal?
- 3-7 What criticisms of public involvement can you expect, and how can these criticisms be answered?
- 3-8 How would you attempt to manage conflict when it arises? If you were looking for someone to help, what qualities would you seek in that person?

Speaker theme

- 3-1 Invite a speaker who is expert in the field to talk about their personal experience in public involvement on major projects and to focus on certain questions. How much did a typical involvement programme cost, what techniques were used, how effective were they? Did people respond positively, were there changes made to the proposal? Was the proponent supportive of the public involvement programme? What lessons were learnt from the experience?
-

Group Activity 3–1: Public involvement

Title: Preparing a public involvement programme

Aim: To reinforce the training material presented through the preparation of a public involvement programme, and consideration of the associated issues.

Group size: Four to six people

Duration: One day

Resources required:

- ☐ Case study description of a proposal, with some details of its likely impacts and setting. Refer to Handout 3-1

Description of activity:

Participants will be required to think through the various issues, and relate the tasks involved to the objectives of the public involvement programme.

Using the case study and referring to Handout 3–1:

- ☐ prepare a public involvement programme, showing the objectives of the programme, and the stages of the EIA process at which public involvement will be sought;
- ☐ indicate how the various stakeholders will be identified;
- ☐ advise when the public involvement should commence, and what level of information should be provided;
- ☐ list the methods which might be used to:
 - inform people
 - identify their concerns, attitudes and knowledge
 - enable them to participate in developing the proposal;
- ☐ prepare a timetable for the programme, indicating the resources (people and money) which will be needed;
- ☐ outline ways to ensure that information gained from the involvement of the public is used constructively to improve the proposal;
- ☐ identify problems which are likely to occur, and ways of managing them; and
- ☐ prepare a framework to evaluate the success of the programme.

Group Activity 3–2: Public Involvement

Title: Site location decisions — what are the facts?

Aim: To show how public involvement can assist in deciding between alternative sites and in achieving public acceptance of a proposal.

Group size: Four to six people

Duration: Three hours

Resources required:

- ☐ Brief description of a facility with two possible alternative locations, a short statement of need for the project, a list of the likely impacts, and a description of the surrounding communities.

Description of activity:

The alternative sites for a facility affect different communities, and will involve some land acquisition. Get each group to:

- ☐ discuss how they would structure the public involvement to minimise conflict, while allowing informed debate on the respective merits of the proposals;
 - ☐ propose steps that could be taken to pre-empt rumours and distortions about what may be proposed;
 - ☐ outline ways in which a shared view of the basic facts could be reached, given that opponents often appear to have a biased view of the basic facts relating to the proposal and the need for action;
 - ☐ detail the sort of information that would be required by the decision-maker before a decision could be made; and
 - ☐ discuss the way in which the public involvement would assist the project.
-



1

Purpose and objectives of public involvement

- informing stakeholders
 - gaining their views, concerns and values
 - taking account of public inputs in decision making
 - influencing project design
 - obtaining local knowledge
 - increasing public confidence
 - improving transparency and accountability in decision-making
 - reducing conflict
-



2

Levels of public involvement

- information
 - (one way flow from proponent to public)
 - consultation
 - (two way exchange of information)
 - participation
 - (interaction with the public)
 - negotiation
 - (face to face discussion)
-



3

Key stakeholders

- local people affected by a proposal
 - proponent and project beneficiaries
 - government agencies
 - NGOs
 - others, e.g. donors, the private sector, academics
-



4

Principles of public involvement

The process should be:

- inclusive – covers all stakeholders
 - open and transparent – steps and activities are understood
 - relevant – focussed on the issues that matter
 - fair – conducted impartially and without bias toward any stakeholder
 - responsive – to stakeholder requirements and inputs
 - credible – builds confidence and trust
-



5

Public involvement in key stages of the EIA process

- screening
 - determining the need for, and level, of the EIA process
- scoping
 - identifying the key issues and alternatives to be considered
- impact analysis
 - identifying the significant impacts and mitigating measures
- review
 - commenting on/responding to the EIA report
- implementation and monitoring
 - checking EIA follow up



6

Developing a public involvement program typically involves:

- determining its scope
- identifying interested and affected public
- selecting appropriate techniques
- considering the relationship to decision-making
- providing feedback to stakeholders
- undertaking the analysis of stakeholder inputs
- keeping to budget and timelines
- confidentiality



7

Factors affecting the effectiveness of public involvement

- poverty
- remote and rural settings
- illiteracy
- culture/local values
- language
- legal systems override traditional ones
- dominance of interest groups
- proponent confidentiality



8

Principles for successful application of public involvement techniques

- provide the right information
- allow sufficient time to review and respond
- provide appropriate opportunities/means for stakeholder involvement
- respond to issues and concerns raised
- feed back the results of public input
- choose venues and times of events to suit stakeholders



9

Principles for minimising conflict

- involve all stakeholders
- establish communication channels
- describe the proposal and its objectives
- listen to the concerns and interests of affected people
- treat people fairly and impartially
- be empathetic and flexible
- mitigate impacts and compensate for loss and damage
- acknowledge concerns and provide feed-back



10

Common reasons given for avoiding public involvement

- it's too early
- it will take too long and will cost too much
- it will stir up opposition
- we will only hear from the articulate
- we'll raise expectations
- people won't understand

Tools and techniques for public involvement

Technique	Description and use	Advantages	Disadvantages
Level 1. Education & information provision			
Leaflets/ Brochures	Used to convey information. Care should be taken in distribution.	Can reach a wide audience, or be targeted.	Information may not be understood or be misinterpreted.
Newsletters	May involve a series of publications. Care should be taken in distribution.	Ongoing contact, flexible format, can address changing needs and audiences.	Not everyone will read a newsletter.
Unstaffed Exhibits/Displays	Set up in public areas to convey information.	Can be viewed at a convenient time and at leisure. Graphics can help visualise proposals.	Information may not be understood or be misinterpreted.
Local Newspaper Article	Conveys information about a proposed activity.	Potentially cheap form of publicity. A means of reaching a local audience.	Circulation may be limited.
National Newspaper Article	Conveys information about a proposed activity.	Potential to reach a very large audience.	Unless an activity has gained a national profile, it will be of limited interest.
Site Visits	Provides first hand experience of an activity and related issues.	Issues brought to life through real examples.	Difficult to identify a site which replicates all issues.
Level 2. Information feedback			
Staffed Exhibits/Displays	Set up in public areas to convey information. Staff available.	Can be viewed at a convenient time and at leisure. Graphics can help visualise proposals. Groups can be targeted.	Requires a major commitment of staff time.
Staffed telephone lines	Can phone to obtain information, ask questions or make comments about proposals or issues	Easy for people to participate and provide comments. Promotes a feeling of accessibility.	May not be as good as face-to-face discussions. Staff may not have knowledge to respond to all questions.
Internet	Used to provide information or invite feedback. On-line forums and discussion groups can be set up.	Potential global audience. Convenient method for those with internet access.	Not all parties will have access to the Internet.
Public Meetings	Used to exchange	Can meet with other	Can be complex, unpredictable

Tools and techniques for public involvement

	information and views.	stakeholders. Demonstrates proponent is willing to meet with other interested parties.	and intimidating. May be hijacked by interest groups.
Surveys, Interviews and Questionnaires	Used for obtaining information and opinions. May be self-administered, conducted face-to-face, by post or telephone.	Confidential surveys may result in more candid responses. Can identify existing knowledge and concerns.	Response rate can be poor. Responses may not be representative and opinions change.
Level 3. Involvement & consultation			
Workshops	Used to provide background information, discuss issues in detail and solve problems.	Provides an open exchange of ideas. Can deal with complex issues and consider issues in-depth. Can be targeted.	Only a small number of individuals can participate. Full range of interests not represented.
Open-House	Location provided, e.g. at a site or operational building, for people to visit, learn about a proposal and provide feedback.	Can be visited at a convenient time and at leisure.	Preparation for and staffing of the open house may require considerable time and money.
Level 4. Extended involvement			
Community Advisory/Liaison Groups	People representing particular interests or areas of expertise, e.g. community leaders, meet to discuss issues.	Can consider issues in detail and highlight the decision-making process and the complexities involved.	Not all interests may be represented. Requires on-going commitment from participants.
Citizen Juries	Group of citizens brought together to consider an issue. Evidence received from expert witnesses. Report produced, setting out the views of the jury.	Can consider issues in detail and in a relatively short period of time.	Not all interests may be represented. Limited time may be available for participants to fully consider information received.
Visioning	Used to develop a shared vision of the future.	Develops a common view of future needs.	Lack of control over the outcome. Needs to be used early in the decision-making process.

Source: *Institute of Environmental Management and Assessment (1999)*

Topic 4

Screening

Introduction

Checklist

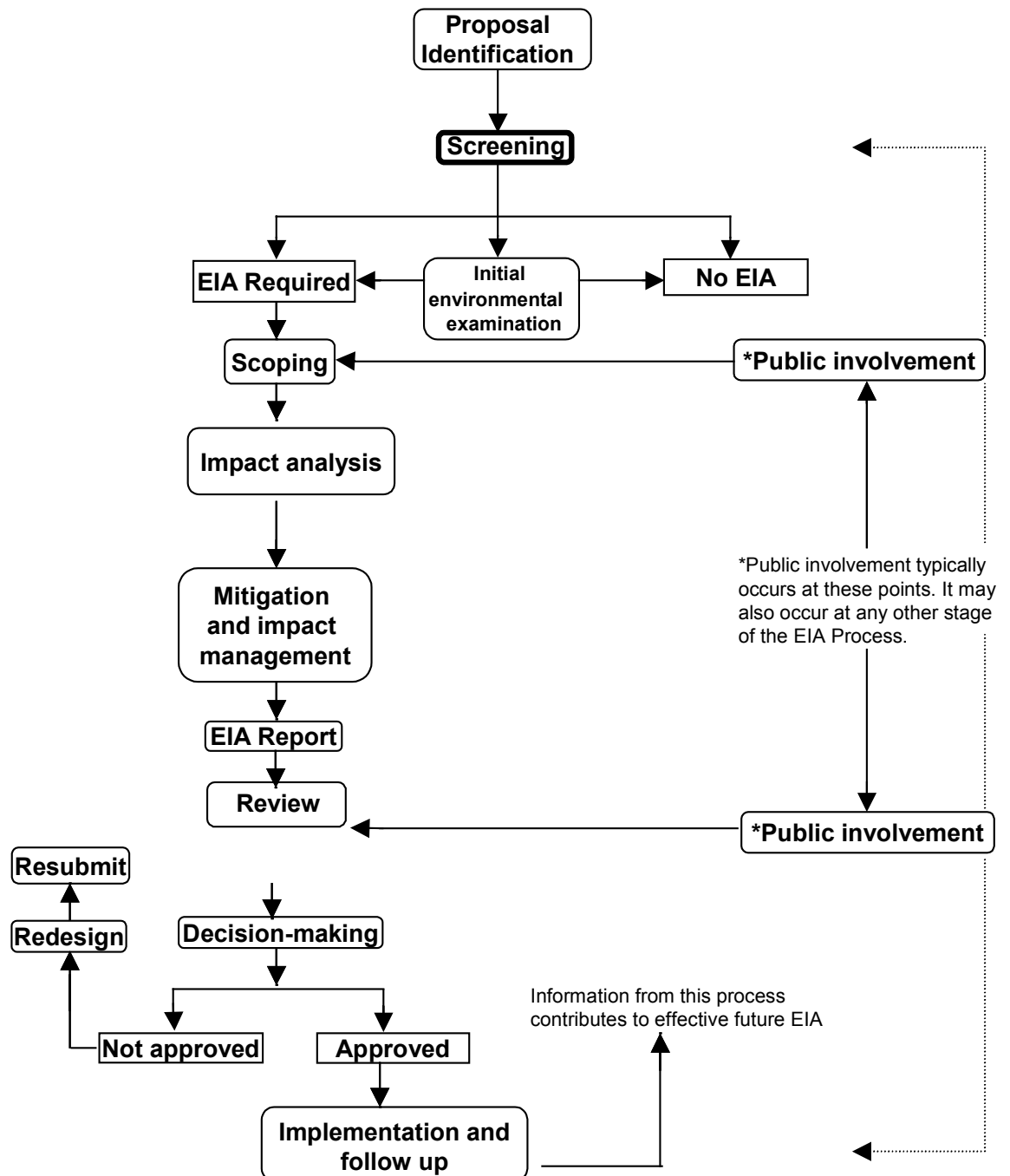
Session outline

Reference list and further reading

Training activities

Support materials

Screening in the EIA process



Topic 4—Screening

Objectives

To introduce the concept of screening.

To describe different procedures and methods for the conduct of screening, and to compare their strengths and weaknesses.

To emphasise the importance of ‘significance’ in screening.

Relevance

Screening determines whether or not a proposal requires an EIA and, if so, what level of analysis is necessary. This process brings clarity and certainty to the implementation of EIA, ensuring that it neither entails excessive review nor overlooks proposals that warrant examination.

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.

Topic 4 Screening



Information checklist

Obtain or develop the following, as appropriate:

- ☐ a description of current screening practice (where it exists) and how it fits into the whole EIA process;
- ☐ the responsibilities and roles of the various parties in screening;
- ☐ legal requirements, lists of included (and excluded) projects, threshold criteria, environmental overviews, guidelines for assessing significance, etc. used during screening;
- ☐ examples of the conduct of screening (locally if possible), application of mechanisms, completed reports etc. along with the final screening decision;
- ☐ contact list of people, agencies, organisations and environmental information/ data systems able to provide assistance in relation to screening; and
- ☐ other resources that may be available such as videos, journal articles, computer programmes, lists of speakers, and case studies.

Session outline

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 they are important.

This topic introduces the different procedures and methods for identifying whether or not an EIA is required for a proposal. It examines their relative strengths and weaknesses, and allows participants to gain initial familiarity with the concept of impact 'significance' and its importance in triggering the right level of EIA review.

Introduce the purpose of screening. Outline the characteristics and outcomes of the screening process, noting that full EIA is required only for certain types of major projects. Mention that in some EIA systems there is an overlap between the screening and the scoping stages of the EIA process (see also Topic 5 – Scoping).



1

Screening is the first stage of the EIA process. Some type of screening procedure is necessary because of the large number of projects and activities that are potentially subject to EIA. The purpose of screening is to identify the proposals that require an EIA and exclude those that do 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 warrant 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 and water quality, or the lifestyle and livelihood of local communities.

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Screening



2

The screening process can have one of 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]).



3

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 discretion of the proponent (as with scoping in the European EIA Directive). 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.

Discuss the different procedures and methods used to screen proposals, highlighting their advantages and disadvantages. Indicate how they might be combined into a comprehensive approach to screening or extended as part of an initial assessment.

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 standardised approach* – proposals subject to or exempt from EIA are defined or listed in legislation and regulations; and
- *discretionary or customised approach* – proposals are screened on an individual or case-by-case base, using indicative guidance.



4

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 (as shown in Figure 1). Where inclusive project lists are used, the disposition of most proposals will be immediately apparent. 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 and criteria established for this purpose. This process gives the proponent or competent authority greater discretion than mandatory lists in determining the requirement for EIA.



5

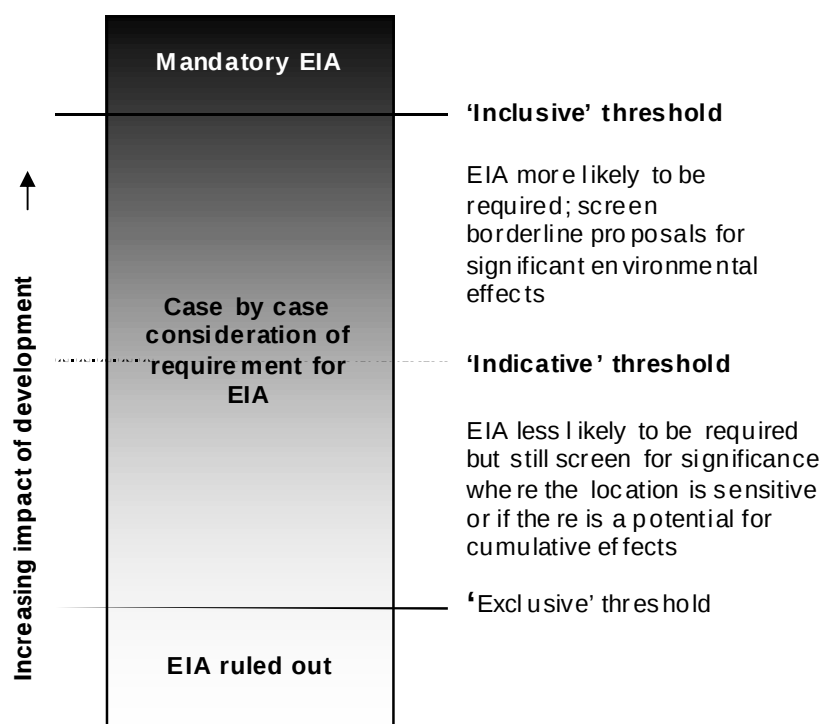


Figure 1: A framework for screening

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Screening



6

In this context, 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);
- environmental overview – carried out as a rapid assessment of the environmental issues and impacts of a proposal; and
- class screening – carried out for a family of small projects or repetitive activities, where the environmental effects and means of mitigation are known but there is potential for cumulative impacts (e.g. dredging, road realignment, bank stabilisation).

Discuss the use of project lists and thresholds, noting their strengths and weaknesses. Consider if these are locally applicable.

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 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 organisations 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. Internationally, reference is often made to:

- Annexes 1 and 11 of the European EIA Directive, which respectively list projects subject to mandatory EIA and non-mandatory EIA; and
- Annex E of the World Bank Operational Directive on EA, which is illustrative and provides a framework for screening.

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 (see Box 1):

- projects requiring a full EIA because of their likely environmental effects (see Box 2);

- projects not requiring a full EIA but warranting a further level of assessment (see Box 3); and
- projects not requiring further environmental analysis (for example health and nutrition, institutional and human resource development and technical assistance).

Listed projects provide a standardised 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 cautiously and with due regard to their weaknesses, especially if they are the sole basis for screening. The automatic application of EIA to proposals may be avoided by staying just below the predetermined size threshold; for example building a major road in 19 km sections when the threshold for inclusion is 20 km. Secondary project lists or other screening procedures should be in place to ensure such proposals are subject to the appropriate level of EIA.

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 quarry (<100 ha) normally would not merit full EIA (e.g. by reference to the World Bank Annex E lists). 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 be directly transferable without alteration.

Box 1: Environmental screening – World Bank classification

- 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.

- 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.
- Category C: for projects that are likely to have minimal or no adverse environmental impacts. No EIA is required.

Source: World Bank (1993)

Box 2: World Bank Category A projects/components

The projects or components included in this list are likely to have adverse impacts that normally warrant classification in Category A

- dams and reservoirs
- forestry and production projects
- industrial plants (large scale)
- irrigation, drainage, and flood control (large scale)
- land clearance and levelling (large scale)
- mineral development (including oil and gas)
- port and harbour development
- reclamation and new land development
- resettlement and new land development
- river basin development
- thermal and hydropower development
- manufacture, transportation, and use of pesticides
- other hazardous and/or toxic materials

Source: World Bank (1993)

Box 3: World Bank Category B projects/components

The following projects and components may have environmental impacts for which more limited analysis is appropriate.

- 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)
- rehabilitation, maintenance, and upgrading projects (small-scale)

Source: World Bank (1993)



4-1

An example of a project list for screening can be found in the resource material at the end of this topic (Handout 4-1).

Discuss the use of indicative guidance and criteria for case-by-case screening, noting any constraints and issues that might need to be addressed. Consider if these are locally applicable.

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, non-borderline proposals may be subject to screening if they are located in sensitive areas or there is a potential for cumulative effects in combination with other current and foreseeable activities. The framework outlined in Figure 1 contains a sieve of screening applications with a progressively finer mesh for including proposals. It has gained a degree of international acceptance as a standard of good practice.



7

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.



8

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*.

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Using the emphasised 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. (One means of doing so is to incorporate a 'bump-up' or 'bump-down' provision into the screening procedure.)

Discuss the use of extended screening and initial assessment, noting any constraints and issues that may need to be addressed. Consider if this approach is locally applicable.

Certain proposals may be subject 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 assemble considerable information. A checklist of the types of information that could be relevant for such a study are summarised in Box 4. This is accompanied by a framework of criteria and questions that can help in the conduct of a preliminary EIA (see Annex 1). 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.



9

Box 4: Information that may be required for a preliminary EIA study

- 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, which are scaled to purpose. (Further information on the various steps involved can be found in the topics that follow.)

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.

Environmental Overview

The *Environmental Overview* was developed by UNDP as an in-house tool to integrate environmental considerations into its proposed activities at either the project or strategic level (see Topic 15 – *Future directions*). Strictly speaking, the Environmental Overview is not equivalent to a preliminary EIA study. However, it is based on similar steps, involves key stakeholders and leads toward the same ends. An Environmental Overview can be completed quickly through the interaction of a mix of specialists. It follows a structured sequence of questions, draws primarily on the more important data sources and conforms to strict guidelines on the organisation and length of the final document.

The Environmental Overview is used by UNDP in the stage of formulating proposals. It leads to early identification of the following:

- the environmental and social baseline conditions of the target area;
- the major environmental and socio-economic impacts and opportunities associated with the implementation of the proposal;
- the modifications or alternatives to the draft proposal; and



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- the measures that are necessary to address the environmental impacts and issues.

The purpose of the overview is to incorporate environmental objectives into the design of the proposal, rather than produce a report. Recently, the Environmental Overview has been promoted as an effective tool for programme design, and, specifically, one that is designed to overcome the 'checklist mentality' of EIA. So far, however, the Environmental Overview has been subject to little testing outside of UNDP initiatives. A copy of the table of contents for the Environmental Overview can be found in the resource material at the end of this topic (Handout 4-2) and may be reviewed in light of the above comments.



4-2

Class screening

A class screening may be undertaken for any type of project or activity where there is a reasonably sound knowledge of the environmental effects and the mitigation measures are well established. This approach is used in certain countries, notably Canada (at both federal and provincial levels), and aspects are also evident in the EIA procedure of the World Bank (see Box 3). It is applicable to small-scale projects that are routine and replicable, such as dredging, installation of culverts and realignments to an existing road.

A class screening will document the accumulated information on their likely impacts and standard mitigation practices. This report then serves as a model in the conduct of future screening of other projects of the same type. It does not relieve a proponent or competent authority of its responsibility for screening and, where necessary, of factoring additional information on site-specific and cumulative effects into a class assessment report or preparing a separate document if a project does not meet all of the previously agreed requirements for mitigation. However, in such cases, class assessment can greatly simplify and streamline the screening process.

Discuss how screening is initiated and how issues might be 'referred', focusing on the applicable EIA process.

Except where exempt by law, all proposed activities should undergo screening to determine whether or not they are subject to EIA. Because of their numbers, the screening procedure needs to be efficient, transparent and robust. In most EIA systems, the proponent or competent authority is responsible for all aspects of the screening process, from initiation to making the final decision on whether or not an EIA is necessary and, if so, at what level. Normally, this process will be undertaken in compliance with the applicable EIA legislation and requirements.

Leading EIA systems have established a number of procedural ‘checks and balances’ for this purpose. They include provision for:

- public notification and record of screening decisions;
- access to relevant information and documentation; and in some cases
- right or avenue of third party appeal for those who consider that the screening procedure has been applied inappropriately.



11

Briefly recall the possible outcomes from the screening process, referring to the flow chart of the EIA process.

Usually, screening has one of four outcomes:

- no further EIA requirement applies – the proposal will have an insignificant impact;
- a preliminary EIA study is required – the proposal will have an environmental impact that must be addressed but can be mitigated;
- a full or comprehensive EIA is required to complete the screening process – the proposal will have a potentially significant environmental impact; or
- an IEE is required – the potential environmental effects of the proposal are unclear or uncertain.

Certain types of proposals often fall automatically into one of these particular categories. For instance, large dams, power stations and oil refineries are nearly always environmentally significant and require full EIA. By contrast, social development or community health proposals rarely demand further assessment. An extended screening process (or IEE) may be undertaken for proposals for which the potential environmental impact cannot be identified readily.

For proposals that require full or further EIA, the next step in the process is to identify the key issues and impacts that need to be analysed. This process of defining the issues to be considered is called ‘scoping’. It is dealt with next in Topic 5– *Scoping*.

Include a training activity to reinforce the topic (if desired).

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

Annex 1: Criteria for the determination of the need for, and level of, environmental impact assessment

Character of the receiving environment

Consider:

- Is it, or is it likely to be, part of the conservation estate or subject to treaty?
- 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?

NOTE: Off-site (out of area) as well as on-site (local) characteristics should be considered, where relevant.

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, transboundary, 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 detriment 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.

Resilience 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.

Confidence of prediction of impacts

Consider:

- What level of knowledge do we have on the resilience of a given significant ecosystem?
- 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?

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?

Degree of public interest

Consider:

- Is the proposal controversial or could it lead to controversy or concern in the community?
- Will the amenity, 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?

Based on criteria developed by the Australian and New Zealand Environmental and Conservation Council (ANZECC) 1996

Reference list

The following references have been quoted directly, adapted or used as a primary source for major parts of this topic.

Australian and New Zealand Environmental and Conservation Council (ANZECC) (1996) *Guidelines and Criteria for Determining the Need for and Level of Environmental Impact Assessment in Australia*. Working Group on National Environmental Impact Assessment, ANZECC, Canberra.

Brown A (1998) The Environmental Overview as a Realistic Approach to Strategic Environmental Assessment in Developing Countries in Porter A and Fittipaldi J (eds) *Environmental Methods Review: Retooling Impact Assessment for the New Century*, pp. 127-134. The Press Club, Fargo, USA.

Canadian Environmental Assessment Agency (CEAA) (1995) *Guide to the Canadian Environmental Assessment Act*. CEAA, Ottawa.

Jones C (1999) Screening, Scoping and Consideration of Alternatives. in Petts J (ed) *Handbook of Environmental Impact Assessment (Volume 1)*, pp. 201-228. Blackwell Science Ltd. Oxford, UK.

OECD (1992) *Guidelines on Environment and Aid: Good Practices for Environmental Impact Assessment of Development Projects*. OECD, Paris.

UNDP (1992) *Handbook and Guidelines for Environmental Management and Sustainable Development*. Environment and Natural Resources Group, UNDP, New York.

World Bank (1993) *Environmental Screening, Environmental Assessment Sourcebook Update No 2*, Environment Department, The World Bank, Washington D.C.

Further reading

Bulleid P (1997) Assessing the Need for EIA. In Weston J (ed) *Planning and Environmental Impact Assessment in Practice*, (pp. 26-41). Longman, Harlow, UK.

Canter L (1996) *Environmental Impact Assessment (Second Edition)*. McGraw Hill Publishing Company, New York.

Commission of the European Communities (CEC), Directorate-General for Development, (1993) *Environment Manual Development Procedures and Methodology Governing Lome IV Development Co-operation Projects - User's Guide*. CEC, Brussels..

Donnelly A, Dalal-Clayton B and Hughes R (1998) *A Directory of Impact Assessment Guidelines, (Second Edition)*. International Institute for Environment and Development (IIED). Russell Press, Nottingham.

European Bank for Reconstruction and Development (EBRD) (1992) *Environmental Procedures*. EBRD, London.

Kristoffersen H and Tesli A (eds) (1996) *Environmental Impact Assessment in the Baltic Countries and Poland – Screening and Quality Control*. Nordic Council of Ministers, NORD 12, Copenhagen.

OECD /DAC (1994) *Towards Coherence in Environmental Assessment: Results of the Project on Coherence of Environmental Assessment for International Bilateral Aid*. Vol. 1. Canadian International Development Agency, Ottawa.

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

- 4-1 What are the strengths and weaknesses of the screening procedure used in the local EIA process?
 - 4-2 Discuss the relative strengths and weaknesses of the following screening methods: project lists with thresholds; case-by-case screening; initial environmental evaluation (IEE) and other types of preliminary EIA study.
 - 4-3 Consider if a list of projects that must always undergo EIA is a useful approach? How would you go about drawing up or amending such a list and choosing the projects to be included?
 - 4-4 What are the benefits and disadvantages of proponents making screening decisions? Is it necessary to make the reasons for the decisions available to the public?
 - 4-5 What are the benefits and disadvantages of allowing an appeal process for screening decisions?
 - 4-6 If a country's EIA legislation or policy prescribes/designates activities in terms of project type only, what are the advantages and disadvantages of also specifying projects by size (e.g. a reservoir or mine lease area more than a certain number of hectares)?
 - 4-7 How might cumulative effects and/or sustainability criteria be incorporated in screening decision-making?
-

Speaker themes

- 4-1 Invite a speaker who has been involved in the conduct of screening to discuss the strengths and weaknesses of the system used locally, giving examples.
 - 4-2 Arrange for speakers representing different stakeholders in the EIA process (e.g. the screening decision-maker, the proponent, the public) to participate in a panel discussion focused on the strengths and weaknesses of the applicable process of screening and how it could be improved.
-

Group Activity 4–1: Screening

Title: Comparison of screening methods

Aim: To gain familiarity with the strengths and weaknesses of different screening methods.

Group size: Four to six participants

Duration: Three hours

Resources required:

- ☐ Three local case studies providing background information used for or relevant to screening the proposals.
- ☐ The screening method and any criteria used for these proposals and one or two other sets of criteria (from donors or other countries) that can be used for comparison. (Handout 4–1 can be used).
- ☐ The screening decisions on these proposals and, if possible, the reasons for these decisions.

Description of activity:

Applying the different types of screening method to the three case studies, answer the following questions:

- ☐ What differences were evident in the way that the different methods operated?
- ☐ What further information would you have liked to have, or other aspects that you would like to have considered, before you had to make the screening decision?
- ☐ Which method was the easiest to use?
- ☐ Which method do you feel gave the most reliable answer to whether EIA was necessary or not? Why?
- ☐ What limitations did each of the screening methods have?
- ☐ What could be the repercussions of these limitations?
- ☐ Compare and discuss the groups' findings with the actual decision made, where available.
- ☐ Suggest modifications that could be made to the local screening process to improve its accuracy, reproducibility, certainty of outcome and accountability.

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Group Activity 4-2: Screening

Title: Screening proposals

Aim: To understand how screening is conducted.

Group size: Class or small group activity

Duration: Three hours

Resources required

- ☐ Five short case studies, one suited to extended screening.
- ☐ Background information, with associated maps, for the proposals that could be required to support the screening decisions.

Description of activity

- ☐ Provide the class or groups with the five short case studies and ask them to screen the proposals, giving reasons for their decisions.
- ☐ Bring the groups back together after the first hour to discuss progress.
- ☐ As a group, develop a list of information which would be required in order to screen projects adequately.

If appropriate, the above activity can include an extended screening process referring to Handout 4-2, and would benefit from being undertaken in conjunction with a site visit to a project.



1

The purpose of screening

The purpose of screening is to determine:

- whether or not a proposal requires an EIA
- what level of EIA is required



2

Outcomes of screening

- full or comprehensive EIA required
- more limited EIA required
- further study needed to determine EIA requirement
- no further requirement for EIA



3

Screening and scoping compared

- Screening – determines the requirement for EIA
 – establishes the level of review necessary
- Scoping – identifies the key issues and impacts
 – establishes the terms of reference



4

Screening methods

- legal/policy definition
- inclusion list of projects (with/ without thresholds)
- exclusion list of projects
- criteria for case-by-case screening



5

Figure 1: A framework for screening



6

Extended screening methods

- initial environmental evaluation or examination (IEE)
- environmental overview
- class screening



7

Typical proposals requiring full EIA include:

- dams and reservoirs
- (re)settlement and urban development
- infrastructure (e.g. transport and sanitation)
- industrial facilities (e.g. manufacturing plants)
- energy and minerals extraction (e.g. oil & gas, coal)
- waste management and disposal of hazardous and toxic materials
- energy development (power stations, transmission lines, pipelines)



8

Location and environmental criteria for case-by-case screening

The following are important in determining significant effects:

- assimilative capacity of the natural environment
- environmental sensitivity, e.g. wetlands, coastal and mountain zones
- environmental standards and objectives
- existing land uses
- adjacent to protected or designated areas
- within landscapes of special heritage value
- abundance and quality of natural resources



9

Extended screening – information required by decision-makers

- description of the proposal
- conditions and characteristics of the environment
- applicable policy planning and regulatory objectives
- identification of potential impacts
- degree of public concern and interest



10

An initial environmental examination

- describes the proposal
- considers alternatives
- addresses the concerns of the community
- identifies potential environmental effects
- established mitigation measures
- includes mitigation and follow up if necessary



11

Flowchart of the process

Project Screening Lists

Screening List A: Projects requiring no environmental analysis

DG VII Sectoral Classification

SOCIAL INFRASTRUCTURE AND SERVICES	
Education	• Educational facilities (small-scale) • Teaching facilities and equipment • Scholarships and conferences • Teaching staff and resource personnel • Audio-visual productions • Training
Health	• Medical centres (small-scale) • Medical supplies and equipment • Medical staff and community health workers • Training • Nutrition
Population	• Family planning
ECONOMIC INFRASTRUCTURE AND SERVICES	• Telecommunications • Research
PRODUCTION SECTOR	• Trade (except trade in tropical hardwoods, endangered species, hazardous materials)
MULTI SECTOR	• Micro-projects/programmes (small-scale capital and service)
FINANCIAL ASSISTANCE	• Programme assistance (general and sectoral import programmes) • Non-project/special country support (stabex)
FOOD AID	• Food aid
EMERGENCY OPERATIONS	• Emergency assistance • Assistance to refugee returnees and displaced persons
AID THROUGH PRIVATE ORGANISATIONS	(REFER TO APPROPRIATE SECTOR)
TECHNICAL ASSISTANCE	• Studies, including evaluations • Technical assistance for project implementation • Technical assistance for policy formulation • Works supervision • Institution building at the government/local level

* Under certain local circumstances, the Delegation can over-ride this categorisation and place the project in Category B, for instance in cases of substantial amounts of food aid.

Source: Commission of the European Communities (1993)

Project Screening Lists

Screening List B: Projects requiring further environmental analysis

DG VIII Sectoral Classifications

SOCIAL INFRASTRUCTURE AND SERVICES

1. Rural and Urban Water Supply and Sanitation	• Rural water supply and sanitation • Land drainage (small scale) • Sewerage systems • Installations for the disposal of sewerage sludge
2. Waste Disposal	• Recycling plants • Installations for the disposal of domestic refuse (large scale)
3. Urban Development	• Housing and commercial projects

ECONOMIC INFRASTRUCTURE AND SERVICES

4. Transport	• Upgrading/rehabilitation of major rural roads • Airports with basic runway length less than 2,100m
5. Ports and Harbours	• Inland ports which permit the passage of vessels under 1350 tonnes • Upgrading of port or harbour facilities (large scale)
6. Energy	• Thermal power stations and other combustion installations with a heat output of less than 300 megawatts • Electricity transmission lines • Rural electrification • Renewable energy (large scale) • Mini-Hydro

PRODUCTION SECTOR

7. Agriculture	• Widespread introduction of new management practices (eg. mechanisation, mixed cropping) • Widespread introduction of new crops • Pest control programmes (large scale) • Widespread introduction of fertilisers • Watershed management and rehabilitation
8. Irrigation	• Surface-water fed irrigation projects covering between 100 and 500 hectares • Ground-water fed irrigation projects covering between 200 and 1000 hectares
9. Forestry	• Protected forest reserves (large-scale) • Agro-forestry (large-scale) • Productive forest reserves (large-scale)
10. Livestock	• Intensive rearing of cattle (>50 heads), pigs (>100 heads), or poultry (>500 heads)

Project Screening Lists

Screening List B: Projects requiring further environmental analysis (cont)

11. Fisheries and Aquaculture	• Intensive aquaculture (large-scale) • Extensive aquaculture (exceeding 50ha, or exceeding 10ha if affecting mangroves) • Artisanal fisheries (large-scale) • Introduction of new species • Introduction of new harvesting technology
12. Mineral Extraction and Processing	• Extraction of aggregate minerals such as marble, sand, gravel, shale, salt, phosphates and potash • Extraction of non-metallic or energy producing minerals (small-scale)
13. Industry	• Agro-industries, including manufacture of vegetable and animal oils and fats, manufacture, packing and canning of animal, fish and vegetable products • Manufacture of timber products, pulp, paper and board (large-scale) • Tannery and leather-dressing factories • Production of chemicals, including pesticides (small-scale) • Industries utilising hazardous materials (small-scale)
14. Tourism	• Accommodation (large-scale) • Amenities (large-scale), such as water, energy, sanitation, waste disposal • Facilities (large-scale), such as beach use, marinas, modifications to ports, entertainment complexes • Ecological or cultural-tourism (dependent upon conservation-worthy ecosystems, flora or fauna; or local populations with a particular cultural identity)
15. Resettlement	• All other resettlement schemes

Source: Commission of the European Communities (1993)

Project Screening Lists

Screening List C: Projects requiring a full Environmental Impact Assessment

DG VIII Sectoral Classifications

SOCIAL INFRASTRUCTURE AND SERVICES

1. Rural and Urban Water Supply and Sanitation	• Canalisation and flood-relief works (large-scale) • Dams and reservoirs (medium and large-scale) • Wastewater treatment plants (large-scale) • Land drainage (large-scale)
2. Waste Disposal	• Waste disposal installations for the incineration, chemical treatment or land fill of toxic, hazardous and dangerous wastes • Installations for the disposal in industrial wastes
3. Urban Development	• Hospital and educational facilities (large-scale)

ECONOMIC INFRASTRUCTURE AND SERVICES

4. Transport	• Major urban roads • New and upgraded motorways/express roads • Rural road programmes • Oil and gas pipelines and installations • Rail infrastructure • Elevated and underground railways and suspended lines used mainly for passenger transport • Inland waterways • Airports with a basic runway length of 2,100m or more
5. Ports and Harbours	• Trading ports • Ports for inland waterways traffic which permit the passage of vessels over 1350 tonnes • Large scale expansions to existing ports and harbours
6. Energy	• Thermal power stations and other combustion installations with a heat output of 300 megawatts or more • Hydroelectric power (large-scale)

PRODUCTION SECTOR

7. Agriculture	• Land clearing/conversion to agriculture (large-scale) • Land reclamation (large-scale)
8. Irrigation	• Surface-water fed irrigation projects covering more than 500 hectares • Ground-water fed irrigation projects more than 1000 hectares
9. Forestry	• Plantation afforestation/reforestation (large-scale)
10. Livestock	• Large-scale open range rearing of cattle, horses, sheep etc

Project Screening Lists

Screening List C: Projects requiring a full Environmental Impact Assessment

11. Fisheries and Aquaculture	• Industrial Fisheries
12. Mineral Extraction and Processing	• Deep drilling, such as geothermal, oil, and water supplies • Extraction of metallic and energy-producing minerals by open-cast mining • Extraction of coal/lignite by underground or open-cast mining • Surface industrial installations for the extraction of coal, petroleum, natural gas and ores • On-site mineral processing facilities (large-scale)
13. Industry	• Industrial estates • Major industrial facilities including the following: - Oil refineries - Gasification or liquefaction plants of 500 tonnes or more of coal or bituminous shale per day - Installations for the production of ferrous and non-ferrous metals, including smelting, refining, drawing, rolling and surface treatment (large-scale) - Installations for the extraction and processing of asbestos and cement products - Treatment and production of chemicals (large-scale), including integrated chemical installations - Manufacture or transport of pesticides or other hazardous and/or toxic materials
14. Tourism	• Coastal development (large-scale)
15. Resettlement	• Resettlement schemes (large-scale)

Source: Commission of the European Communities (1993)

Environmental overview (initial environmental evaluation)

Environmental overview (initial environmental evaluation)

Operational guidelines

Taken from UNDP, *Handbook and Guidelines for Environmental Management and Sustainable Development* (New York, 1992), part II, pages 30-39. ³

Environmental Management Tools

Four management tools to be used at each step of UNDP operations are discussed in this section.

In addition, environmental documents and related reference materials are now being produced in copious amounts. As many of these materials could be used to prepare Environmental Overviews and Management Strategies, a library-style reference system on the environment could be set up in each field office. That is, environmental information arriving at UNDP field offices could be categorized and collected in one place for staff members to be able to consult and retrieve.

Field offices that already have libraries could set up sections on the environment and encourage Programme Officers to forward all appropriate documents to this facility. Field office environmental focal points may also assist offices in assuring that environmental management processes are completed as outlined here and that environmental information flowing into the office is disseminated to the appropriate staff members, government counterparts and NGOs. Activities of the Sustainable Development Network and the Global Environment Facility should also be linked to the guidelines.

Tool 1: Environmental Checklist for UNDP Technical Cooperation

To ensure that proper consideration has been given to the environment, a checklist serves as a reminder to those participating in activity implementation (See Box 1.) These specific questions should be answered to facilitate the process of assessing whether the environmental dimension has been included.

Tool 2: Environmental Overviews

An Environmental Overview (EO) is an assessment tool that forms the basis for an Environmental Management Strategy. The aim of this short document is to provide basic information on the present environmental situation of a country or project. It will also include an assessment of how the environment might be altered if the programme or project is implemented. This tool is the simplest instrument which can be used to determine whether a proposed activity is being designed and implemented within an environmentally sound and sustainable approach. The EOs will be used in designing all UNDP activities.

All Environmental Overviews should:

- identify the main environmental opportunities and constraints that the implementation of the programme or project could bring about;
- suggest alternatives to the programme/project design that would take better advantage of potential environmental opportunities and/or mitigate likely environmental disturbances associated with the programme/project; and
- identify areas of uncertainty regarding modifications to the environment, as well as those potential social and economic conflicts that might arise if environmental changes are introduced in the programme/project area.

Whether the overview is prepared for a Country Programme or for specific projects and programmes, it should not be longer than seven pages. Box 2 (Preparation of Environment Overviews for UNDP Country Programmes [EOCs]) and Box 3 (Preparation of Environmental Overviews for UNDP-sponsored Projects and Programmes [EOPs]) contain annotated outlines of what to include in each type of overview. Only Box 3 is included in this reading excerpt.

The responsibility of preparing EOs belongs to those who are proposing a programme or project and, when appropriate, should be included in the terms of reference. This would include UNDP staff, other UN agency professionals, government or NGO counterparts and outside experts.

Environmental overview (initial environmental evaluation)

For the Country Programme, the EOC should be prepared at the same time the Advisory Note is being drafted. For a project or programme document, the EOP should be done before or while the Project Formulation Framework (PFF) is being drafted but not finalised. This leaves ample time to make revisions if necessary and to incorporate mitigation measures and other environmental considerations throughout the Note or PFF. Once the EO is prepared, some of the information it contains should be incorporated into appropriate sections of the Advisory Note (eventually the Country Programme) or the actual PFF (for example, justification, objectives and so forth). The EO should also be attached as an annex to the programme/project document so that it can be reviewed by the Project/Programme Activity Committee (PAC) and the Action-Committee (AC).

Generally speaking, EOs are not based on original research, although occasionally independent research might be necessary. EOs should be developed mainly from existing information contained in country environmental profiles such as those prepared by other international organizations, academic institutions, bilateral donors and NGOs (for example, those of the World Bank and Interregional Development Banks, or the national reports prepared for the UN Conference on Environment and Development). New information should be generated only if no other details about the characteristics/functions of the local environment are available. Participatory development techniques that take advantage of grass-roots knowledge will help improve the accuracy of EOs.

An EOP should in principle be prepared for all projects from forestry to education to management training. For projects that lack any environmental factors or potential environmental components, the EOP will be limited to one page of outline subheadings with an explanation in each case as to why it is not applicable. For projects that do not have detailed EOPs, the project document chapter on 'Special Considerations' will explain in brief that no EO was created because of the non-applicability of the topic. Very few projects will fall under this category, however.

UNDP staff should use the information contained in the document as an important input to the evaluation of the proposed programmes and projects. The EOC can influence, for example, the drafting of many sections of the Country Programme.

Box 1. Environmental Checklist for UNDP Cooperation

- Has an EOC/EOP been prepared for the programme/project?
- Does the programme/project document include explicit actions to prevent and conserve the environment?
- Have the sources of environmental impact (positive and negative) been properly identified in the programme/ project document?
- Does the programme/project document include environmental mitigation measures?
- Have the potential conflicts of interest been properly addressed in the document?

Tool 3: Environmental Screening of UNDP Activities Using EOPs

EOPs contain the necessary basic information to allow those who are designing or responsible for the proposed programme/activity to decide whether the activity deserves further environmental consideration. To facilitate this, box 4 provides five main reference points to screen UNDP proposed activities. These criteria are not comprehensive, but mainly serve as a reminder for the environmental reviewer. EOCs will also be annexed to the Country Programme, and this will provide the basis for assessing the environmental performance of the programme or project over time.

After UNDP screens the EOPs, the following choices of action exist:

- Given potential environmental opportunities and/or the absence of negative environmental impacts, write the final document (incorporating the EOP) and submit it to the PAC and, if necessary, the Action Committee.
- Do not pursue the proposal further due to its potential negative impact on the environment.
- Request additional information/clarification regarding the environmental characteristics of the area where the proposed activity is expected to take place; demand elaboration of some aspects of the EOP

Environmental overview (initial environmental evaluation)

or expansion of information regarding potential environmental impacts prior to drafting the final document.

- Introduce changes to the design presented in the PFF to eliminate or mitigate potential negative environmental impacts, or to make better use of opportunities.
- Recommend preparing an in-depth Environmental Management Strategy for the project document that would be referred to throughout the implementation of the activity.

If the screening process leads to a choice to provide UNDP support for the programme/project under consideration, the EOP should be annexed to the project document.

Tool 4: Environmental Management Strategies

An Environmental Management Strategy (EMS) is a detailed action oriented plan prepared for UNDP projects. Environmental Overviews answer the question 'what' is happening or might happen to the environment with a proposed action. Environmental Management Strategies answer the questions:

- 'how' (to improve the environment or mitigate its disturbance),
- 'when' (at what time, through the life of a project, this will be done),
- 'who' (will be accountable for implementing and monitoring environmental activities),
- 'how long' (before the results will be seen), and
- 'what is required' (in terms of experts, information, institutional and financial support) for integrating environmentally sound and sustainable development principles within a proposed development activity.

Box 2 Preparation of Environmental Overview of Programme (Project) and Management Strategy (EOP/MS) Annotated Outline for Tool 2 and Tool 4

Although the text of this EOP/MS refers to projects, it can also be used for programmes. This outline contains a 'menu' of possible topics that might assist staff members to develop EOPs. Thus the sections included here should be completed only when applicable (see also Annex III for a sample EOP and MS). Information can be presented sectorally rather than geographically if necessary. Linkages between sections should be identified

1 Brief Description of the EOP/MS Environment of the Area of the Project (1 page maximum)

In general, this section is intended to provide all those who are participating in the development of a UNDP Project with basic general information on the physical characteristics of the environment in the area. The idea is to highlight any important aspects of the natural environment that might be a determinant in the design, appraisal, extension, approval and assessment of a proposed UNDP regional, national or local project.

Land and water ecosystems

Describes those types of land and water ecosystems that characterize the project area (such as plains, valleys, mountain ecosystems, rivers, lakes) and whether any of these are known to represent untapped environmental opportunities or areas of particular environmental concern. Includes information on climate if appropriate, such as when the project relates to specific types of agricultural production. In urban areas, describes briefly the relevant geographical features.

Living resources

Describes (1) the biological species (fauna and flora) in the project area that represent particular concerns and/or opportunities for the environment (for example, the unexploited potential of certain resources such as medicines that could be obtained from tropical forest species), (2) the socio-cultural context in the project area (population size, ethnicity, poverty and gender indicators etc.).

2 Main Environmental Issues in the Project Area (1 page maximum)

This section covers the three environmental issues that are most important in the area where the project will be implemented—whether, for example, the area is prone to flooding, there is an ongoing process of desertification, or the sustainable fish catch potential is smaller than present exploitation. Topics to

Environmental overview (initial environmental evaluation)

consider might include quality of life of the local population, natural hazards, fragile ecosystems, role of children and women and over-crowding. Consultations with local population groups will improve the accuracy of this section.

3 Economics and the Environment in the Project Area (1 page maximum)

This section generally discusses whether the prevailing economic situation in the project area will affect the environment. Lists any prevailing national or local economic policies and regulations in the project area that affect the quality of the environment. Any enforcement mechanisms that prevail in the project area to protect the local environment should also be included. General statements about the population's socio-economic situation may be added if not listed under 1 above.

4 Environmental Management in the Project Area (1 page maximum)

This section should describe the capacity of the people and institutions working in the project area to cope with their environmental problems, achieve appropriate environmental management and promote sustainable development.

Legal and regulatory

Describes whether there are explicit environmental policies and regulations in the project area and, if so, whether they have the enforcement mechanisms and appropriate technical and financial support to be effective.

Major environmental actors

Includes a brief description of the main environmental actors in the project area (government authorities, international organizations, private sector, NGOs, individuals) and their objectives and strategies. Identifies possible conflicts among the actors if the proposed project is implemented. Consider whether women play an active role in all these groups and are able to make the necessary contributions, explain their role.

Technical and managerial capacity to deal with environmental issues

Describes generally the existing educational, technical and managerial capacity in the project area (within the public, private, NGO and academic sectors) to deal with the environmental issues relevant to the project. Special emphasis should be given to the presence and activities of grass-roots organizations working on environmental protection. The strength and resources of environmental institutions in the project area should be briefly assessed.

5 Major Natural and Socio-Economic Impacts and Opportunities Associated with the Project Implementation (1 page maximum)

Both these sections should incorporate the views of the affected population groups; participatory development techniques should therefore be used whenever possible.

Potential impacts on the natural environment

Identifies the potential impacts, both positive and negative, that the implementation of the project may have upon the natural environment. Identifies the three most important environmental impacts that the implementation of the project might bring about, and describes how the project will address them. If the project is on agroforestry, for example, indicates whether soil conservation, watershed management and appropriate selection of pesticides and fertilizers have been envisaged.

Potential socio-economic impacts

Lists the three most important potential benefits and costs to the socio-economic impacts environment that may result from the implementation of the project.

6 Alternatives for Project Design (1/2 page maximum)

This section will discuss the possibility of altering the project design (technology, project objectives and methodology of implementation) to take better advantage of the opportunities offered by the environment in the project area, and to mitigate and eliminate the environmental disadvantages that the project might create.

Environmental overview (initial environmental evaluation)**7 Identification of Environmental Objectives of the Proposed Activity (1/2 page)**

The EOP/MS should state clearly and succinctly the environmental objectives of the alternative. These must conform with the broader development objectives of the country and therefore might go beyond the particular activity's goals. If a proposed activity does not explicitly indicate any environmental objectives, UNDP staff should request that such objectives be identified.

For example, a project on animal-husbandry might identify production targets but not explicitly include environmental objectives. If the proposed activity will introduce new technologies or exotic animal and plant varieties, relocate people or introduce new chemical products, the local environment will be affected. The strategy, in this case, will help identify and clearly design the environmental objectives of such an animal-husbandry project. Environmental objectives could include soil protection, plant conservation and integrated agricultural development.

8 Identification of Conflicts of Interest

Some of the objectives pursued by different environmental actors might conflict. For example, the interests of companies that commercialize chemical fertilizers will conflict with activities aiming to promote organic fertilization. The EOP/MS must identify such conflicts of interest and devise possible alternatives to avoid them. In the previous example, an incentive might be proposed for the commercial chemical enterprise to sell other fertilizers (including organic) that will promote soil fertility without damaging the environment.

9 Formulation of an Operational Strategy

The most important action-oriented part of the EOP/MS is the formulation of an operational strategy that will allow the achievement of the environmental objectives and goals proposed by the EOP/MS. The strategy must be formulated by the staff proposing, designing or evaluating the activity in consultation with project participants.

Specific environmental targets to be achieved

Identifies specific environmental targets in addition to the main environmental policy objectives identified in Section 2. If the proposed activity entails manufacturing processes (such as tanneries or food processing) which generate waste, for example, specific environmental targets would be set such as reducing all waste emissions by 15% over a period of three years and installing interim measures.

Participants in environmental management

Identifies the objectives and strategies of the major actors related to the environment in the area where the proposed activity will take place.

Plan of activities and timetable

Identifies a number of activities that will lead to the implementation of the strategy. A timetable must also be formulated indicating when such activities are expected to occur, and who will be responsible for them. As the EOP/MS will eventually become part of either the programme or project document, the proposed environmental activities and timetable should be compatible with the overall activities and timetable of the Programme or Project. Relevant national and local activities and timetables should also be considered.

Environmental information

Provides reliable and accurate environmental information as the basis for sustainable decision making, while acknowledging that accurate environmental information is difficult to obtain, especially in developing countries. The EOP/MS might include efforts to obtain the most accurate environmental information relevant to the proposed activity or to initiate work that will generate the necessary information over an identified period.

Supporting needs

Identifies the specific needs required for the successful implementation of the strategy. The needs to be identified include:

- Education and training

Environmental overview (initial environmental evaluation)

- Technical and managerial skills
- Access to environmental data banks
- Institutional support
- Financial aspect

The development and implementation of the EOP/MS requires technical and financial resources. Technical assistance might be needed from UNDP in order to develop the strategy and identify the resources required to carry it out.

Assigning implementation responsibilities

States clearly who will be accountable for implementing each one of the activities proposed within the strategy.

Decision making

Analyzes the environmental chain of command and responsibilities in the area where an activity is being considered. This analysis should not be restricted to the chain of command in the environmental field (ministry of the environment, forestry sector) but should include the other sectors of the economy that are intimately related to the environment such as industry, trade, health, and so on. The objective is to identify to whom suggestions and recommendations—indeed, the entire EOP/MS—would be addressed. It should also include what would be the most efficient way to influence the decision-making process to protect and enhance the environment.

10 Monitoring the EOP/MS

Every UNDP-sponsored activity is monitored regularly to ensure that its stated objectives are being achieved in the time framework envisaged. As the EOP/MS will probably be incorporated into the programme or project document that describes the proposed activity, it should be monitored according to the procedures presented. Constant, cautious monitoring on an as frequent a basis as possible, using specific success indicators for the points raised in the strategy, will help guarantee that the objectives are achieved.

The main difference between an EO and an EMS is that the latter is an ongoing effort demanding close UNDP monitoring throughout the activity while the former is a more static undertaking completed during project formulation. The EMS should be prepared by those proposing the implementation of a project: mainly government officials, NGOs, academic institutions and UN agencies responsible for implementation. Terms of reference will need to refer to the EMS preparation.

The EMS, as part of the EOP/MS, steps 7 to 10, will be prepared according to the specifications provided in Box 3, using participatory development techniques to the greatest extent possible. The length of an EMS can vary greatly, so guidelines on the length of each section are not included. UNDP staff are responsible for ensuring that the EMS is prepared according to these guidelines. It is recommended that the proposed project executor undertake the technical coordinating responsibilities, using, as necessary, appropriate UN agencies and/or other affiliated agencies or NGOs.

The ideas expressed in the EMS eventually need to be incorporated into the objectives, activities, inputs, work plan and so on of the project or programme document. Special references should also be made to the EMS and, if necessary, a specific section summarizing the EMS should be added. The EMS should also be attached as an annex to these documents to assist in monitoring the activities over time.

Environmental overview (initial environmental evaluation)

BOX 3 Criteria for Screening UNDP EOCs and EOPs Tool 3

It is recommended that the programmes/projects that fall within any of the following categories be subject to further environmental consideration:

Environmentally Sensitive Areas or Activities

- Activities leading to encroachments on tropical rain forests, wetlands, mangrove forests, coral reefs, coastal zones or other vulnerable areas
- Activities changing natural vegetation and/or the habitats of wildlife species, or in areas inhabited by endangered species
- Activities in legally declared protected areas
- Ecologically fragile areas (including those identified as such by NGOs)
- Areas subject to desertification, arid and semi-arid zones, drylands
- Ecotourism activities
- Areas of unique conservation, historical, cultural, archaeological or aesthetic interest
- Areas of particular social significance (habitats for nomadic people or indigenous populations)
- Areas where pre-established pollution limits have been exceeded or where activities would lead to air, water, soil, radioactive or noise pollution

Livestock, Farming and Fishing Practices

- Sustainable agriculture
- Activities leading to soil erosion or in soil-conservation areas
- Integrated pest control or pesticide use/management
- Agroforestry
- Afforestation
- Activities leading to increased grazing
- Introduction or modifications of new crops or livestock
- Introduction of new species where there is limited knowledge of the ecological functions of the local ecosystem
- Biotechnology
- Activities with the possibility of exceeding carrying capacity (eg. catching larger quantities of fish than can be replaced by natural rate of growth)
- Controlled breeding and exploitation of fish or shellfish carried out in marine or inland waters or in artificial ponds

Activities Dealing with Water Resources

- Water management
- Irrigation and flood control
- Hydroelectric
- Ground water
- Management of inland wetland ecosystems
- Health and sanitation

Infrastructure and Industrial Strengthening

- Large infrastructure and urbanization activities (eg. port development, airports and railway systems)
- Energy generation
- Mining (land and water)
- Activities leading to conflicts over use of resources (eg. port development and tourism)
- All industrial development
- Activities causing emissions to soil, water and air and/or that may endanger the environment

Environmental overview (initial environmental evaluation)

- Activities demanding considerable increases in consumption of raw materials (water, land, fossil fuels)
- Activities creating major changes in landscape
- Activities creating risks of accidents that could have serious consequences for local people or the natural environment
- Occupational safety and training
- Activities that introduce immigrant labour and change local social fabric

Urbanisation, Land Development and Waste Management

- Human settlements (housing, office, commercial buildings)
- Land-use planning or road building
- Activities leading to accumulation of waste and creation of unwanted disposal sites
- Production, transport or storage of hazardous wastes.
- UNDP Environmental Overview
- ADB Checklist of Environmental Parameters for Major Dam/:Reservoir/Hydropower Projects

Topic 5

Scoping

Introduction

Checklist

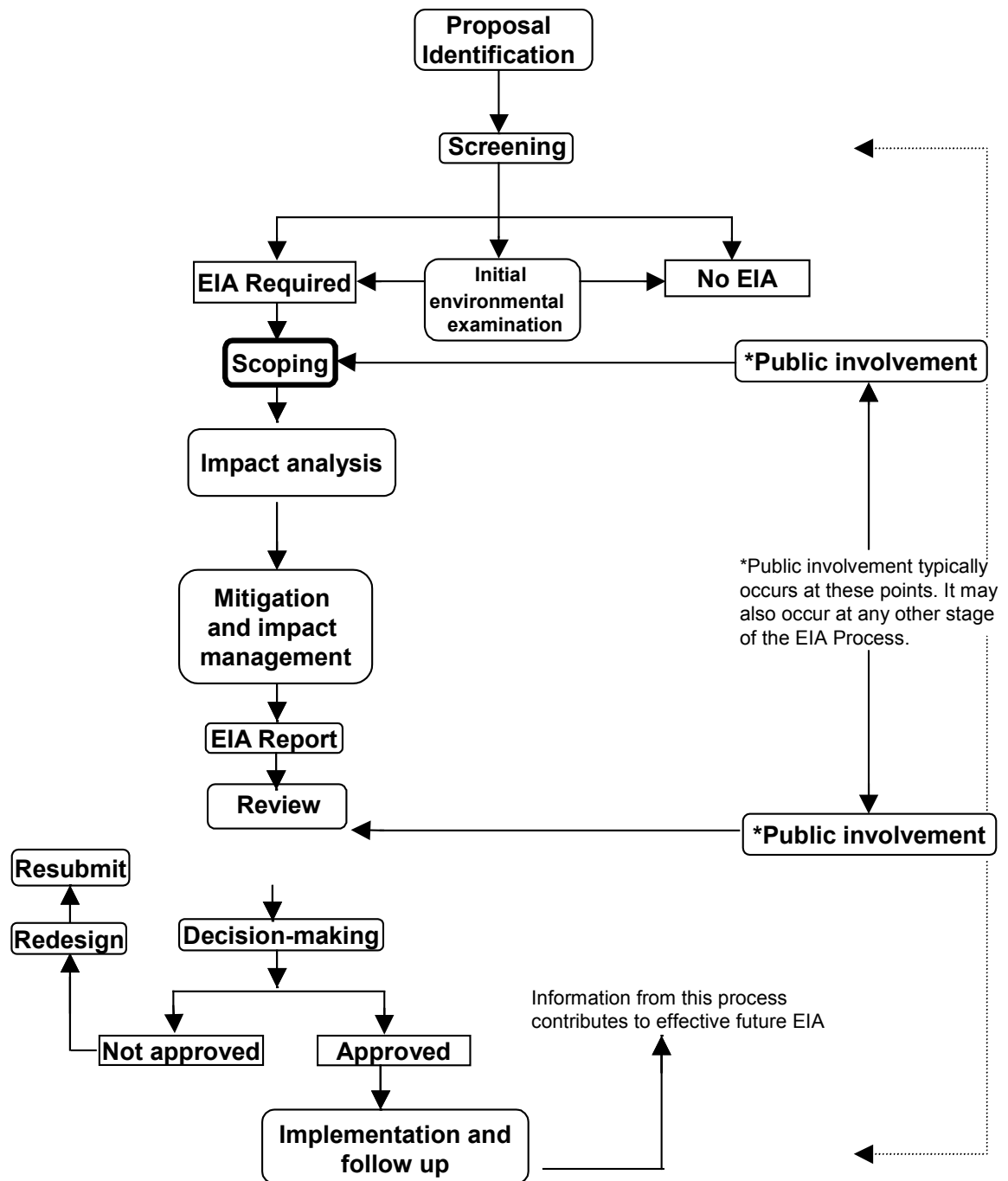
Session outline

Reference list and further reading

Training activities

Support materials

Scoping in the EIA process



Topic 5—Scoping

Objectives

To understand the role and purpose of scoping in the EIA process.

To identify principles of scoping and elements of approach.

To gain familiarity with the procedures and methods commonly used in the conduct of scoping.

To recognise the importance of the consideration of alternatives during the scoping phase.

To be aware of the processes for establishing Terms of Reference and boundaries for EIA studies.

Relevance

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. In this way, EIA studies are focused on the significant effects and time and money are not wasted on unnecessary investigations.

Timing

Three 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.



Information checklist

Obtain or develop the following, as appropriate:

- ☐ details of the scoping procedure used locally, including any requirements for public involvement;
- ☐ information on the scoping process used in other countries in the region;
- ☐ applicable regulations, policies, or guidance relating to scoping;
- ☐ sample Terms of Reference or other documents prepared during scoping;
- ☐ examples of scoping analyses undertaken locally, which demonstrate good and bad practice;
- ☐ indications of the resources necessary to support scoping, in terms of time, people and money;
- ☐ copies or results of any research focused on the scoping phase of EIA;
- ☐ contact names and telephone numbers of people, agencies, organizations and environmental centres able to provide information on, and assistance in, scoping; and
- ☐ other resources that may be available, such as courses on techniques used in scoping, videos, journal articles, computer programmes, lists of speakers, and case studies.

Session outline

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 they are important.



1

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.

Outline the role of scoping in the EIA process and encourage the participants to consider, and, if necessary, develop a definition of scoping that is applicable locally. Note that there is often confusion in the terms used by different countries for the early stages of the EIA process (screening, scoping, etc).



2

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 help define the feasible alternatives to a proposed action. Not all EIA systems make provision for the generation or review of alternatives during scoping. These may follow, instead, from the issues that are identified as important. However, consideration of alternatives during scoping is becoming accepted, internationally, as an EIA 'good practice'.

Topic 5
Scoping

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 analysed in an EIA and focuses the approach to be taken.

Scoping is completed when Terms of Reference (ToR) or an equivalent document is prepared. 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.

Involve the group in exploring the purpose of scoping in EIA.

Scoping provides the foundations for an effective and efficient EIA process. When systematically carried out, scoping highlights the issues that matter and results in Terms of Reference 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 itself 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.



3

Explore with the group guiding principles for the scoping process. Introduce the elements of a comprehensive approach to scoping and ask participants whether and how these might be applicable locally.



4

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

- recognise scoping is a process rather than a discrete 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.



5

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 functions:

- 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 prioritise 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.

A systematic and transparent approach should be taken to sifting and paring down the concerns, issues and impacts. This can be undertaken in three steps (corresponding to those listed above):

Step 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.

Step 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 (see Topic 6 – *Impact analysis* and Topic 7 – *Mitigation and impact management* for further information).

Topic 5
Scoping

Step 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 for the EIA study.

Box 1 contains an indicative list of activities to be carried out when scoping in accordance with this approach. The list begins with ‘getting ready’ by preparing a profile of the scope under key headings and using this as a basis for informal consultations with key stakeholders. Once this round of discussion has occurred, the three steps described above take place with iterations between them. Finally, the Terms of Reference are established, with provision for adjustment and feedback as and when necessary during the EIA process.

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 Terms of Reference, 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.



6

Box 1: Indicative list of scoping activities

Getting ready

1. Prepare a preliminary or outline scope with headings such as:
 - objectives and description of the proposal
 - the policy context and environmental setting
 - data and information sources, constraints etc.
 - alternatives to the proposal
 - concerns, issues and effects identified to date
 - provision for public involvement
 - timetable for scoping, EIA and decision making
2. Develop the outline scope by informal consultation and by assembling available information, identifying information gaps, etc.
3. Make the provisional scope and supporting information available to the public.

Undertaking scoping

4. Draw up a long list of the range of issues and concerns.
5. Evaluate their relative importance and significance to derive a short list of key issues.
6. Organise the key issues into the impact categories to be studied.

Completion and continuity

7. Amend the outline scope to progressively incorporate the information from each stage.
8. Establish the Terms of Reference for the EIA, including information requirements, study guidelines, methodology and protocols for revising work.
9. Monitor progress against the ToR, making adjustments as needed and provide feedback to stakeholders and the public.

(As stated these steps are only indicative, and should be tailored to meet the requirements of the particular situation.)

Outline procedures and methods commonly used for the conduct of scoping and describe briefly how they can be useful. Note that although scoping is an early step in an EIA, the importance of issues is continually re-evaluated as new information becomes available.

Depending upon the EIA system, responsibility for scoping may lie with the proponent, with the competent authority, or with the EIA agency or an independent body set up for the purpose. In many cases, some form of guidance will be given on the conduct of scoping, the procedures to be followed and the methods that can be used to undertake the consultative and technical components of this activity. For specific proposals, it may be possible to draw upon previous experience, represented by existing scoping documentation for a similar proposal, or generic or sector guidelines and checklists. None of these aids, however, replace the need for designing a scoping process for each proposal and its likely consequences.

A custom-tailored scoping process will include an overview or profile of the proposal, the environment and community that is likely to be affected, the possible alternatives, the range of potential impacts, and the ways these may be mitigated or managed. In addition, the following should be addressed:

- geographical area(s) and the time-frame(s) for impact analysis;
- the policy and institutional frameworks under which the EIA will be conducted;
- existing information sources, gaps and constraints on methodology;
- the scheduling of the EIA study, and the allocation of resources and responsibilities; and
- the relationship to the decision-making process – including modification of design and selection of alternatives – as well as final approval of the proposal.

The use of impact models or cause-effect frameworks may be helpful during scoping of large-scale proposals, which have a wide range of potentially

complex effects on the environment. But they can also have value in other cases where it is sometimes easy to overlook long-term and secondary impacts of proposals. For example, waste discharged into the air or waterways can extend a long way beyond the boundaries of a project, and heavy metals can bio-accumulate in species and food chains. The identification of such potential impacts can be assisted by a systematic consideration of the various phases of the project life cycle, from construction through operation to decommissioning.

A proposed plan for public involvement in the EIA process (including the scoping phase) should be prepared. Early consideration should be given to the means of informing and involving the people who are likely to be directly affected by or interested in a proposal. A first step is to draw up a list of participants who should be involved in scoping. Both the overall approach to scoping and the mechanisms for consultation need to take into account local values, traditions and culture (see Topic 3 – *Public involvement*).

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.

Although scoping is a distinct, early process within EIA, the significant effects continue to be re-interpreted throughout an EIA study, the decision-making process and project implementation and monitoring. Unforeseen issues that require further consideration may arise in any of these phases. The work undertaken for an EIA study on a particular issue (the impact of toxic effluent on aquatic species and human health, for example) may uncover further questions, some of which may become contentious. In some cases, earlier guidance may need to be revisited, for example relating to data collection and analysis or the criteria used to interpret the significance of effects. Ultimately there are no 'right' answers to these questions, just a succession of judgements that try to balance the available resources for the study (both time and money) with the legitimate concerns of the participants.

Ask the group to outline the possible roles in scoping of the various stakeholders in the EIA process.



7

The proponent/competent authority:

will know most about the proposal, and have a strongly developed view about the factors that will influence the site selection and other aspects of decision-making. It is common for the proponent or the competent authority to have responsibility for scoping. The scoping process helps them to recognize the perspective of others, to consider alternatives and concerns of those affected, and to make changes to the proposal, which will address these inputs.

The EIA administering body:

will generally establish and oversee statutory or procedural requirements for scoping. The requirements for scoping may cover the matters to be addressed, the people to be consulted, and the form of consultation. The administering body may issue Terms of Reference for the EIA, and/or review and approve the EIA report submitted by the proponent, checking it against the agreed scope.

Other responsible agencies:

will contribute relevant information about specific issues and matters within their jurisdiction. This information may include specific legislative requirements, policy objectives, and standards, technical knowledge and expertise, and experience with similar projects or local conditions. Certain agencies other than the competent authority also may have the role of providing licences, permits, approvals or leases. Knowledge of these requirements is essential at the scoping stage.

EIA practitioners and experts:

may act directly for the agencies involved or for the proponent as consultants retained for the EIA work, or they may function in an advisory or review capacity on behalf of scientific, NGO or professional bodies. Their involvement can be of particular value in providing specialist knowledge.

Those people affected by the proposal:

will have a major role in identifying concerns and issues and providing local knowledge and information. Their views should be taken into account in choosing between alternatives, in deciding on the importance of issues, and in identifying mitigating measures, compensation provisions and management plans. Affected communities may need help in understanding the proposal, its alternatives, and their likely effects, and in organising and articulating their concerns to those involved in the EIA process.

The wider community:

will also provide information and views that are relevant to scoping. This grouping includes those indirectly affected by the proposal, and local,

national and sometimes international NGOs and interest groups. Further information on undertaking a dialogue with stakeholders can be found in Topic 3 – *Public Involvement*.

By involving the public, scoping helps to build confidence in the EIA process. Often, the scoping process is the first major point of contact with the stakeholders who are affected by or interested in the proposal and the alternatives. It provides an important opportunity to inform them about the proposal and the EIA process, to understand their concerns and to set out the role and contribution of public involvement in decision-making. Experience indicates that where scoping responds to stakeholder and public inputs, even though it cannot always accommodate them, there is likely to be increased acceptance of the EIA and decision making processes.

Discuss ways in which the identification and consideration of alternatives can be undertaken.



8

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 minimising 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 analyse 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 matures 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-minimising or energy-efficient technology); and
- scheduling alternatives (e.g. for airport and transport operations, reservoir drawdown).

The World Bank recommends a tiered approach to the analysis of alternatives, which broadly corresponds to the headings above. It is designed to bring environmental considerations into all stages of development planning. This approach, ideally, begins with strategic environmental assessment (SEA) to analyse broad alternatives within a sector (such as power) or for a region (see Topic 14 – *Strategic Environmental Assessment*). When this framework is not in place, as is frequently the case, the key alternatives are examined as part of a project-specific EIA. An application of the tiered approach in this context is illustrated in Box 2.

In many cases, a fully tiered approach may not be possible. Certain alternatives will have been foreclosed by earlier stages of decision-making. However, some alternatives may remain open and a preliminary scan can help to identify them. Normally, a retroactive analysis of alternatives is not considered to be good practice unless circumstances warrant; for example a proposal may be well advanced but have a potentially significant impact on the environment or involve the relocation of large numbers of people (see Box 2).

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 (see Box 3). It is 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 viable alternatives, but this needs to be used selectively. For example, the affected communities would have a minimal role in the review of demand and supply-side alternatives to the Nam Theun II project (as described in Box 2) but a primary one in assessing the environmental and social suitability of location alternatives.

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).

In many EIA studies, the preferred alternative will be the most closely examined, and may be the only alternative to be considered in detail. However, it is not uncommon for several alternatives to be investigated at the same level of detail during the impact analysis and evaluation phases, prior to selecting from among them.

Box 2: Tiered approach to analysis of alternatives (Laos)

The 600 MW Nam Theun II Hydroelectric Dam is intended to strengthen the revenue and economic base of the People's Democratic Republic of Laos by exporting power to Thailand. When submitted to the World Bank, the dam height, location and reservoir surface area had been established already. The Bank asked the proponents to return to the objectives and conduct an alternatives analysis against them, in effect a re-scoping process.

The following aspects were considered:

- evaluation of the potential for demand side management (DSM)
- identification and screening of alternative energy sources to hydropower
- evaluation of realistic alternative energy sources
- comparative assessment of alternatives
- identification of hydroelectric alternatives
- evaluation of hydroelectric alternatives
- comparative assessment of hydroelectric alternatives
- comparison of conceptual and design alternatives for the proposed project

The results were used in national power sector planning by the Lao PDR; in planning by development finance institutions for their activities in the region and the power sector; for planning by private investors; in identifying stakeholder concerns; and as an input to preparation and environmental assessment of Nam Theun II project components.

Source: World Bank (1996)

Box 3: Siting alternatives in an EIA for a hydropower project (Pakistan)

The Ghazi-Barotha Hydropower Project is a major run-of-river power project designed to meet the acute power shortage in Pakistan. The main project elements include a barrage located on the Indus River, a power channel (designed to divert water from the barrage) and a power complex. Alternative locations for these elements were evaluated based on technical, economic, environmental and social constraints by an interdisciplinary project team and reviewed by an external environmental and resettlement panel.

Initial assessment of five barrage sites identified by the project consultants resulted in two options being selected for detailed evaluation. The preferred option has less

storage capacity than the main alternative, but was preferable in terms of environmental impact.

The most economical alignment for the power channel would have necessitated resettlement of an estimated 40,000 people. Moving the alignment to less densely populated areas, although technically more complex and financially less attractive, reduced the resettlement requirement to approximately 900 people. Additional modifications further reduced the impact on archaeological sites and graveyards.

Five power complex sites were initially studied, and three remained for detailed evaluation. Topographical factors determined the preferred option, as the environmental implications were broadly similar in each case. Sub-elements of the power complex, such as access roads, head pond capacity and embankments, were chosen based on environmental and technical considerations.

Finally, four alternative alignments were evaluated for the 500 kV transmission line connections to the main grid station. The selected routes had minimal environmental and socio-cultural impacts. Detailed design focused on choosing alignment and tower locations with minimal impacts on dwellings, agricultural land and archaeological sites.

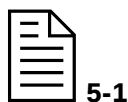
Source: World Bank (1996)

Ask the group to identify the types of information that could be required by Terms of Reference for an EIA.

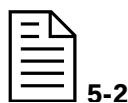
In concluding the scoping process, the preparation of Terms of Reference (ToR) for an EIA is an important task. Alternatively, or as a supplement to ToR, a formal scoping report may be issued (especially useful if the issues and/or process are controversial). In some EIA systems, the proponent prepares a more informal document to summarise the conclusions of scoping and the approach to be taken by an EIA study. The test for Terms of Reference (or its equivalent) lies in its usefulness to and robustness in successive stages of the EIA process.

A number of international agencies have issued sample or framework Terms of Reference, including the World Bank (see Handout 5 - 1) and the OECD Development Assistance Committee (see Handout 5 - 2). These and other generic documents outline the types of information to be included in a ToR or equivalent document. When reviewing these, it is important to remember that Terms of Reference provide guidance and direction to the proponent. The document should be comprehensive yet as concise as possible. Many of the components listed below will occupy a paragraph or less.

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



5-1



5-2



9

- 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 Terms of Reference 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 variations to the working brief will be negotiated.

Topic 12 – *EIA project management* gives more detail on the management of projects, including the building of a team, budgeting and reporting.

Include a training activity to reinforce the topic (if desired).

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

Reference list

The following references have been quoted directly, adapted or used as a primary source for major parts of this topic.

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Canter L and Clark R (1997) Scoping in the EIA Process in the United States in *Report of the EIA Process Strengthening Workshop*. (pp. 31-47). Environment Protection Agency, Canberra.

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World Bank (1996) Analysis of Alternatives in Environmental Assessment. *Environmental Assessment Sourcebook Update No. 17*. Environment Department World Bank, Washington. D.C.

Further reading

European Commission (1995) *Scoping in Environmental Impact Assessment – A Practical Guide*. Directorate General for Environment, Nuclear Safety and Civil Protection, Brussels.

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Jones C (1999) Screening, Scoping and Consideration of Alternatives in Petts J (ed) *Handbook of Environmental Impact Assessment*. (Vol. 1, pp. 201-228). Blackwell Science Ltd, Oxford, UK.

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

World Bank (1995) *Environmental Assessment Challenges and Good Practice*. Paper No. 018. Environment Division, Washington D.C.

World Bank (1991) *Environmental Assessment Sourcebook*. Volume 1. World Bank Technical Paper No. 139, 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

- 5-1 'The scoping phase should result in a conclusive list of matters which will be addressed in the EIA study; issues suggested at later stages should not be considered.' Is this view tenable?
- 5-2 Why is it important to define the purpose and objectives of a proposal, and the alternatives to be considered? Do these reasons apply equally to private and public sector proposals? What about proposals like mining where the location of the ore body is fixed?
- 5-3 'Sectoral guidelines can obviate the need for scoping.' Discuss and explore how scoping practices might supplement such general guidelines in a particular case.
- 5-4 Discuss the difference between primary and secondary impacts, in relation to a dam, a tourism facility, a major highway, a nuclear power station or a paper mill.
- 5-5 How much information should the proponent assemble before scoping commences? Can the proponent collect too much information too early, and if so, what are the likely consequences?
- 5-6 Who should make decisions on the relative significance of issues? What factors will influence such decisions during scoping?
- 5-7 What sources of data should be investigated prior to scoping? Why is it necessary to identify data gaps, and to collect data in such areas? How can different data needs affect the time and cost of EIA studies?

Speaker theme

- Invite a project manager for a development company or a competent authority to talk about experiences with scoping for an EIA reviewing the following questions. What procedure was followed? Which steps were taken? Did the list of key issues identified through scoping need to be extended during the later stages of the study? Were local communities involved? How useful was their input compared to the assistance of EIA experts? What changes were made to the initial proposal as a result of the issues generated during the scoping phase? What further changes were made, for example during later in-depth investigation of those issues?

Group Activity 5–1: Scoping

Title: Scoping a proposed development

Aim: To develop an appreciation of the scoping process by undertaking scoping for a local project (preferably real, but if not hypothetical)

Group size: Four to six people

Duration: Half day to whole day (as required)

Resources required:

- ☐ A case study description of a (real or hypothetical) proposal, with some details of its setting.
- ☐ Notes on scoping provided to the course participants, together with some form of checklist or sectoral guidelines.

Description of activity:

Each member of the small group will take a role as the representative of the proponent, the EIA administering body, the competent authority, the affected local community, and a regional NGO that has a direct interest in the proposal. As necessary, add representatives for other responsible government agencies, environmental NGOs, etc.

Using the case study provided:

- ☐ each member of the group should separately consider, from the perspective of their role, the range of alternatives that might be considered (consult the typology of options in the notes – demand, activity, location, process etc. – and refer to Handout 5–1);
 - ☐ discuss the range of alternatives generated, and agree which ones should be taken forward for further study;
 - ☐ each member should make a list of the likely impacts of the proposal; compare the lists and reach consensus on the key issues;
 - ☐ select three of the key issues, and detail the study programme necessary to adequately address each issue; and
 - ☐ prepare Terms of Reference for the EIA study (refer to Handout 5–2), covering the agreed alternatives and the three selected issues.
-

Group Activity 5–2: Scoping

Title: Initiating the scoping process

Aim: To understand the information needs at the beginning of the scoping process

Group size: Three or four people

Duration: Half-day in total comprising one hour's preparation, and a further one hour during which each group can make their presentation (10 to 15 minutes per group). Conclude with a general discussion of the merits of each presentation.

Resources required:

- ☐ Brief case study description of a proposal, the setting and the nature of the surrounding communities.

Description of activity:

Participants are required to develop a presentation to a meeting of local residents (the rest of the group), at which the proposal is to be unveiled, and the scoping process commenced. The presentation should be planned to cover:

- ☐ the purpose of the meeting;
 - ☐ the objectives of the proposal;
 - ☐ the requirements of the EIA and scoping processes;
 - ☐ the likely impacts of the proposal and how they will be managed;
 - ☐ how the community can become involved in the scoping process;
 - ☐ what other opportunities will be provided for the community to voice their concerns;
 - ☐ how the proponent proposes to conduct the EIA, including the studies to be undertaken; and
 - ☐ the timetable proposed for the completion of the EIA and the decision-making process.
-



1

Flowchart of the EIA process



2

Scoping:

- early step – begins once screening completed
 - open, interactive process — involves the public
 - lays the foundation of an EIA – by identifying
 - boundaries of the EIA study
 - the information necessary for decision-making
 - key issues and significant impacts to be considered
-



3

Key objectives of scoping

- inform and identify stakeholders
 - find out their concerns
 - consider feasible and practical alternatives
 - identify the main issues and impacts to be studied
 - define the boundaries of the EIA study
 - agree on means of public involvement
 - establish the Terms of Reference
-



4

Guiding principles for the conduct of scoping

- scoping is a process not an activity or event
 - design the scoping process for each proposal
 - start early, as soon as information permits
 - prepare information package on what is expected
 - specify the role of the public in decision-making
 - approach should be systematic; implementation should be flexible
 - document the results to guide preparation of EIA
 - respond to new information and issues as necessary
-



5

The conduct of scoping

- identify range of concerns
 - evaluate them to determine key issues
 - categorize the impacts that require study
 - establish a strategy for addressing them
-



6

Steps in the scoping process

- prepare an outline scope
- develop the outline through informal consultation
- make the outline available
- compile the range of concerns (long list)
- evaluate these to establish key issues (short list)
- organise these into impact categories (study list)
- amend the outline to incorporate the above information
- develop Terms of Reference
- monitor progress against them, revising as necessary



7

Who should be involved in scoping?

- the proponent
- the competent authority
- the EIA administering body
- other responsible agencies
- EIA practitioners and experts
- key stakeholders i.e. those affected by the proposal
- the wider community



8

Consideration of alternatives

- demand alternatives
- supply or input alternatives
- activity alternatives
- location alternatives
- process alternatives
- scheduling alternatives



9

Outline Terms of Reference:

- objectives and background to the proposal
- study area and boundaries
- alternatives to be examined
- opportunities for public involvement
- impacts and issues to be studied
- the approach to be taken
- requirements for mitigation and monitoring
- information and data to be included in the EIA report
- timetable and requirements for completion of the EIA process

Framework Terms of Reference for environmental assessment of development assistance projects

TOPICS TO BE ADDRESSED	BASIC REQUIREMENTS	PROCEDURAL CONSIDERATIONS	OPERATIONAL CONSIDERATIONS	PROJECT STAGES
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A FRAMEWORK TERMS OF REFERENCE FOR ENVIRONMENTAL ASSESSMENT OF DEVELOPMENT ASSISTANCE PROJECTS

(From OECD/DAC, (1994) *Towards Coherence in Environmental Assessment — Results of the Project on Coherence of Environmental Assessment for International Bi-lateral Aid*. Canada)

TOPICS TO BE ADDRESSED	BASIC REQUIREMENTS	PROCEDURAL CONSIDERATIONS	OPERATIONAL CONSIDERATIONS	PROJECT STAGES
A. INTRODUCTION				
1. BACKGROUND	<i>Introduce the project and the most critical environmental issues involved.</i>	Briefly review the events leading up to the conduct of the assessment.	List the main participants in the assessment process.	Concept (i) Pre-feasibility (s) Feasibility (s)
B. CONTEXT				
2. THE PROBLEM	<i>Summarise the basic developmental issue or problem being addressed by the proposed activity, i.e., pollution, flooding, drought, erosion, energy shortage, poor health, depressed economy, etc.</i>	Characterise the issue or problem in its broader national context, i.e., historical perspective, root causes, implications for development, and prior attempts at resolution.	As they become available, use results from the environmental assessment to refine the problem statement.	Concept (i) Pre-feasibility (s) Feasibility (s)
3. PROPOSED SOLUTION	<i>Summarise the way in which the proposed activity is expected to resolve the issue, or solve or alleviate the problem, with the emphasis on sustainability.</i>	Describe the critical requirements for the proposed activity to be successful in the long-term, and identify the major risks and benefits involved.	Identify the technical or operational aspects of the project that are most problematic in terms of achieving sustainability.	Concept (i) Pre-feasibility (s) Feasibility (s)
4. CO-OPERATION AMONG JURISDICTIONS	<i>Summarise the agreement or arrangements between the donor(s) and the recipient country under which the environmental assessment is being conducted.</i>	Describe the sharing of roles and responsibilities, emphasising the lead role to be played by the recipient country in the conduct of the assessment.	Provide a brief overview of other relevant past cooperative efforts between the donor and the recipient country, including strategies for capacity development.	Concept (i) Pre-feasibility (s) Feasibility (s)
5. OBJECTIVES OF THE ASSESSMENT	<i>State clearly the objectives of the assessment and the relationship of the results to project planning, design, implementation and follow-up.</i>	For donor and recipient country, highlight critical points in the decision making process linking environmental assessment and project execution.	Note those aspects and outcomes of the project which are considered most likely to be affected by the results of the assessment.	Pre-feasibility (s) Feasibility (s)
C. INSTITUTIONAL SETTING				
6. LEGAL/POLICY BASE	<i>Summarise the legal, policy and procedural bases for environmental assessments in the recipient country and the donor agency.</i>	Identify potential areas of conflict or disagreement and describe how these have been, or can be, overcome.	Ensure agreement on sensitive issues, such as pollution standards, criteria for impact evaluation, relocation and compensation.	Concept (i) Pre-feasibility (s) Feasibility (s)

Framework Terms of Reference for environmental assessment of development assistance projects

Key s – if stage occurs concurrently with assessment
r – influenced by results of assessment

i – information sources for the assessment

7. INSTITUTIONAL CAPACITY	<i>Summarise and provide an appraisal of the strengths and limitations of the recipient country in the various fields of environmental protection and management.</i>	Assess capacity and past experience of institutions in managing domestic and foreign assistance projects; identify capacity building needs (including training).	Focus on key aspects, including the number and competency of staff, size of operational budgets and availability of appropriate technology and equipment.	Concept (i) Pre-feasibility (s) Feasibility (s)
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D. ALTERNATIVES

8. ALTERNATIVES TO THE PROJECT				
(a) Policy Interventions	<i>Assess the potential for achieving the basic developmental objective by interventions at the policy level.</i>	Evaluate options such as using economic instruments, controlling supply and demand, and encouraging reuse/ recycling.	Identify key potential constraints, such as lack of expertise, and inefficient administrative systems.	Concept (i) Pre-feasibility (s) Feasibility (s)
(b) Other Projects	<i>Assess the potential for achieving the basic developmental objective by implementing other projects which are substantively different than the one proposed.</i>	Assess reasonable options, such as alternative sources (for energy projects), alternative modes (for transportation projects) and alternative practices (for agricultural projects).	Identify key constraints, such as the inadequacies of existing infrastructure, time limitations and a lack of financial resources.	Concept (i) Pre-feasibility (s) Feasibility (s)
9. ALTERNATIVES WITHIN THE PROJECT	<i>Evaluate potential alternatives for key aspects of the proposed project, i.e., options for siting, waste management, energy conservation and pollution control technologies.</i>	Assess the potential to implement such alternatives, depending upon the specifics of the project and the design options available.	Identify the most reasonable alternatives and incorporate them into the detailed analysis of environmental impacts.	Prefeasibility (s) Feasibility (s)

E. INSTITUTIONAL AND PUBLIC INVOLVEMENT

10. INSTITUTIONAL COOPERATION	<i>Show clearly how the proposed project conforms with the overall development strategy and priorities of the recipient country.</i>	Describe the manner and extent to which other government institutions in the recipient country were consulted or participated in the assessment.	Describe the procedures used to gain access to information held by other agencies, and what extent they were successful.	Pre-feasibility (s) Feasibility (s)
11. PUBLIC INVOLVEMENT	<i>Show how affected groups and NGOs in the recipient country, and interested publics in the donor country, were given the opportunity to participate in the assessment process.</i>	Explain the manner in which information was distributed to, and received from, members of the public, and how that information was used in project planning.	Describe efforts at public scoping, and explain how the results were used to focus the assessment on critical issues particularly in regard to collection and interpretation of data.	Pre-feasibility (s) Feasibility (s)

Key s – if stage occurs concurrently with assessment
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Framework Terms of Reference for environmental assessment of development assistance projects

TOPICS TO BE ADDRESSED	BASIC REQUIREMENTS	PROCEDURAL CONSIDERATIONS	OPERATIONAL CONSIDERATIONS	PROJECT STAGES
F. REQUIRED INFORMATION AND DATA				
12. DESCRIPTION OF PROJECT	<i>Describe the project (design life, location, layout, size, capacity, activities) inputs (land, raw materials, energy) and outputs (products, by-products, emissions).</i>	Identify indirect impacts arising from induced changes in land use or ownership and from utilisation of local natural resources as raw material for the project.	Identify and quantify sources of impacts, i.e., emissions, effluents, waste products and noise, with particular emphasis on toxic materials.	Pre-feasibility (s) Feasibility (s)
13. DESCRIPTION OF ENVIRONMENT	<i>Identify study boundaries which can provide baseline data on relevant (as determined from scoping results) physical, ecological, economic, social, cultural and demographic conditions within those boundaries.</i>	Clearly show how information received from the general public through a scoping process was used to limit and focus baseline studies on the important issues.	Identify and quantify receptors of impacts, i.e., components of ecological systems at risk, vulnerable human groups (and sub-groups) and valued resources.	Pre-feasibility (s) Feasibility (s)
14. INFORMATION QUALITY	<i>Assess the quality of all information, identify data gaps, and summarise the limitations placed on the assessment from such deficiencies.</i>	Recommend measures to ensure that important data bases of reliable quality will be established and maintained for future projects.	Where appropriate and feasible, design the monitoring plan for the proposed project to fill the identified data gaps.	Pre-feasibility (s) Feasibility (s) Monitoring and Evaluation (r)
G. ANALYSIS OF IMPACTS				
15. POSITIVE IMPACTS	<i>Predict how the lives of the affected people will be improved and any enhancement of natural systems resulting from project implementation.</i>	Focus on values determined through scoping, i.e., traditional economy, improved health, better living conditions, conservation of local ecosystems.	Use quantitative analysis where possible; take account of past trends and experience with similar projects.	Pre-feasibility (s) Feasibility (s)
16. NEGATIVE IMPACTS				
(a) Natural Resources	<i>Predict any significant reduction in the quality of air, water and soil or loss of biodiversity.</i>	Emphasise threats to the integrity of ecosystems that could affect economic or social sustainability.	Use predictive qualitative models where possible, to avoid vague predictions.	Pre-feasibility (s) Feasibility (s) Design and Engineering (r)
(b) Human Resources	<i>Evaluate the risk of significant deterioration in the health or well-being of the affected people.</i>	Use the results of public consultation to focus the analysis on locally important concerns and issues.	Undertake an economic and social valuation of the predicted environmental impacts.	Pre-feasibility (s) Feasibility (s) Design and Engineering (r)
(c) Relocation and Compensation	<i>Evaluate plans for involuntary relocation and describe measures taken to minimise the number of relocations.</i>	Assess the success of previous relocation programmes and recommend changes in current plans accordingly.	Evaluate the fairness and equity of criteria for determining compensation, and identify required changes.	Pre-feasibility (s) Feasibility (s) Design and Engineering (r)
(d) Cumulative Impacts	<i>Evaluate the incremental contribution to the long-term degradation of local natural and social systems.</i>	Compare the severity of cumulative impacts with those from other previous development activities.	Review past trends and compare current quality indicators to estimated or perceived thresholds.	Pre-feasibility (s) Feasibility (s) Design and Engineering (r)

Framework Terms of Reference for environmental assessment of development assistance projects

(e) Trans-Boundary Impacts	<i>Evaluate the potential for neighbouring countries to be impacted and the potential effects on the global commons.</i>	Identify the most likely sources of extra-territorial impacts and describe how such impacts will be kept to a minimum.	Focus on any far-field effects of pollution, and impacts on species or ecosystems of global importance.	Pre-feasibility (s) Feasibility (s) Design and Engineering (r)
(f) Impact Significance	<i>Define the meaning of the term "significant" and assess the significance of the expected impacts.</i>	Where possible, determine thresholds that reflect local environmental and socio-economic values.	State the environmental quality standards to be applied in the assessment.	Pre-feasibility (s) Feasibility (s)

H. MITIGATION AND MONITORING

17. ENVIRONMENT MANAGEMENT PLAN	<i>Provide a detailed plan covering mitigation of predicted impacts, management of residual effects, relocation and compensation schemes, decommissioning, and training programmes.</i>	Allocate roles and responsibilities and show how the Management Plan is expected to influence project final design, operation and eventual decommissioning.	Present mitigation plans in sufficient detail that they can be incorporated into the criteria for project design, operation and shutdown.	Design and Engineering (r) Monitoring and Evaluation (r)
18. ENVIRONMENT MONITORING PLAN	<i>Provide a comprehensive and detailed plan covering the environmental and social variables to be monitored, the location and timing of sampling and the use to be made of monitoring data.</i>	Clearly state the institutions(s) responsible for the monitoring plan and how the resulting information will influence the operation of the project.	Provide sufficient guidance (and training where necessary) on sampling protocols and analytical standards to ensure the generation of reliable data.	Monitoring and Evaluation (r)

I. CONCLUSIONS AND RECOMMENDATIONS

19. PROJECT DECISIONS	<i>Indicate the extent to which the proposed project conforms with the general principles of sustainable development.</i>	Show how the project has been modified to make it more sustainable and explain the shortcomings that remain.	Compare the proposed project with reasonable alternatives, in terms of benefits and environmental impacts.	Feasibility (s)
20. TECHNICAL MATTERS	<i>Summarise the design and operational changes that are considered critical to improving the environmental acceptability of the project.</i>	Note any legal, policy, procedural or administrative impediments to achieving the required changes to the project.	Note any engineering constraints or risks to achieving the necessary technical changes.	Feasibility (s)
21. NON-TECHNICAL SUMMARY	<i>Summarise, in non-technical terms, the key findings and recommendations of the assessment, including the main economic benefits, significant environmental effects and proposed mitigation measures.</i>	Summarise any changes required to in-place management systems to ensure that the project is designed and operated in accordance with the recommendations of the environmental assessment.	Highlight the technical and procedural aspects of the assessment that pose the greatest risk to the successful completion and operation of the project, and the recommended strategies to circumvent these.	Feasibility (s)

Key s – if stage occurs concurrently with assessment
 r – influenced by results of assessment

i – information sources for the assessment

Sample Terms of Reference (ToR) for environmental assessment

Sample Terms of Reference (ToR) for Environmental Assessment

Introduction: state the purpose of the terms of reference.

Background information: briefly describe the need for, objectives of and major components of the proposal.

Objectives: summarise the scope of the EIA and timing in relation to project preparation, design, and approval.

EIA requirements: identify the regulations and guidelines governing the conduct of the EIA and/or specify the content of its report.

Study area: outline the time, space and jurisdictional boundaries of the study.

Scope of work: identify the tasks to be carried out, information deficiencies to be addressed, studies to be carried out, methodologies etc.

Task 1. Description of the proposed project: provide a brief description of the relevant parts of the project, using maps (at appropriate scale) where necessary.

Task 2. Description of the environment: assemble, evaluate and present baseline data on the relevant environmental characteristics of the study area. Include information on any changes anticipated before the project commences.

Task 3. Legislative and regulatory considerations: describe the pertinent regulations and standards governing environmental quality, health and safety, protection of sensitive areas, protection of endangered species, siting, land use control, etc.

Task 4. Determination of the potential impacts of the proposed project: distinguish between significant positive and negative impacts, direct and indirect impacts, and immediate and long-term impacts. Identify impacts that are unavoidable or irreversible. Wherever possible, describe impacts quantitatively, in terms of environmental costs and benefits.

Task 5. Analysis of alternatives to the proposed project: describe alternatives that were examined in the course of developing the proposed project and identify other alternatives which would achieve the same objective.

Task 6. Development of management plan to mitigate negative impacts: recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels and describe the actions necessary to implement them.

Task 7. Identification of institutional needs to implement environmental assessment recommendations: review the authority and capability of institutions at local, provincial/regional, and national levels.

Recommend steps to strengthen or expand them so that the management and monitoring plans in the environmental assessment can be implemented.

Sample Terms of Reference (ToR) for environmental assessment

Task 8. Development of a monitoring plan: prepare a detailed plan to monitor the implementation of mitigation measures and the impacts of the project during construction and operation.

Task 9. Public/NGO participation and inter-agency co-ordination: describe how the arrangements for obtaining the views of local NGOs and affected groups, and in keeping records of meetings and other activities, communications, and comments and their deposition.

EIA report: keep it concise and limited to significant environmental issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used.

Source: adapted from World Bank 1991

Topic 6

Impact analysis

Introduction

Checklist

Session outline

Reference list and further reading

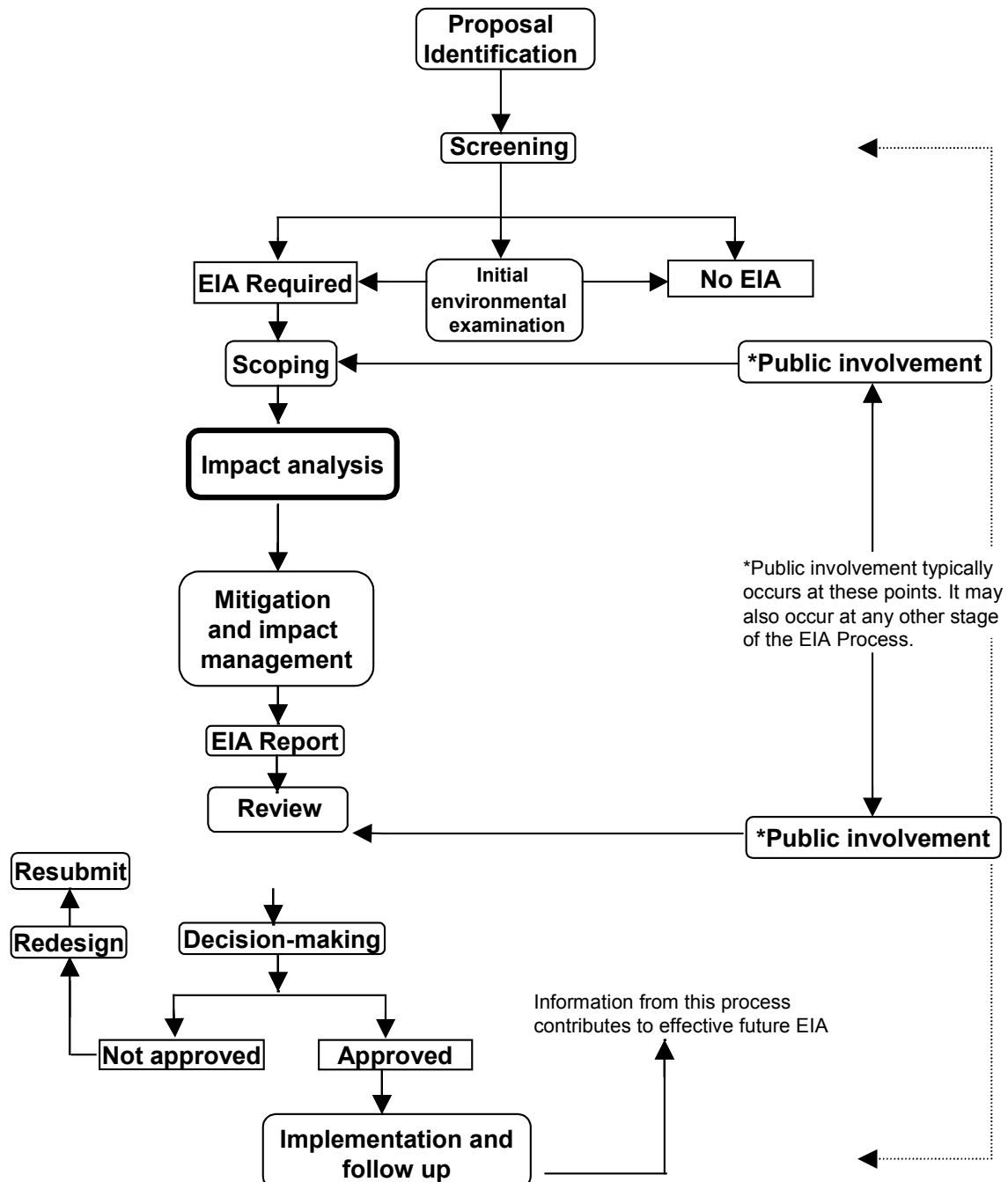
Training activities

Support materials

Impact analysis in the EIA process

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graph TD; A[Proposal Identification] --> B[Screening]; B --> C[EIA Required]; B --> D[Initial environmental examination]; B --> E[No EIA]; D --> C; D --> E; C --> F[Scoping]; F --> G[Impact analysis]; G --> H[Mitigation and impact management]; H --> I[EIA Report]; I --> J[Review]; J --> K[Decision-making]; K --> L[Not approved]; K --> M[Approved]; L --> N[Redesign]; N --> O[Resubmit]; O --> F; M --> P[Implementation and follow up]; P --> Q[Information from this process contributes to effective future EIA]; Q --> R[Public involvement]; R --> J; R --> S[Public involvement]; S --> F; S --> T[Public involvement]; T --> B;
```

The flowchart illustrates the EIA process, starting with **Proposal Identification**, followed by **Screening**. From **Screening**, the process can lead to **EIA Required**, **Initial environmental examination**, or **No EIA**. **Initial environmental examination** leads to either **EIA Required** or **No EIA**. **EIA Required** leads to **Scoping**, which leads to **Impact analysis**. **Impact analysis** leads to **Mitigation and impact management**, which leads to **EIA Report**. **EIA Report** leads to **Review**, which leads to **Decision-making**. **Decision-making** can result in **Not approved** (leading to **Redesign** and **Resubmit**, which loops back to **Scoping**) or **Approved** (leading to **Implementation and follow up**). **Implementation and follow up** leads to **Information from this process contributes to effective future EIA**, which leads to **Public involvement**. **Public involvement** can occur at multiple stages, including **Scoping**, **Review**, and **Decision-making**. A note states: **Public involvement typically occurs at these points. It may also occur at any other stage of the EIA Process.*



Topic 6—Impact analysis

Objectives

To provide an overview of the tools and methods used to identify, predict and evaluate different types of impacts.

To understand how these methods can be used in EIA practice, and their relative strengths and weaknesses.

Relevance

A large kit of tools and methods is used to aid the systematic identification, prediction and evaluation of impacts. Those involved in EIA need an understanding of 'how' and 'when' different methods can be appropriately used.

Timing

Four 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.

Topic 6 Impact analysis



Information checklist

Obtain or develop the following, as appropriate:

- ☐ a resource bank of locally appropriate impact identification and prediction methods (e.g. checklists, matrices, overlays etc);
- ☐ examples of their application to actual proposals;
- ☐ a table of the different types of environmental impacts that have been identified in local projects, especially impacts that are particular to the region;
- ☐ examples of other impact analysis methods that can be used to assess social, health and economic impacts;
- ☐ examples of methods used to make judgements about impact significance;
- ☐ examples of EIAs in which a range of alternatives were examined, identifying, where possible, methods that were used to compare and choose between them;
- ☐ copies of any research focused on the use of methods for impact identification, prediction and evaluation of significance;
- ☐ contact names and telephone numbers of people, agencies, organisations and environmental information/data resource centres able to provide assistance in relation to impact analysis; and
- ☐ other resources that may be available such as courses in specific analytical or methodological techniques, videos, journal articles, computer programmes, lists of speakers, and case studies.

Session outline

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 they are important.

This topic is structured to reflect the three phases of impact analysis that are undertaken as part of the EIA process:

- identifying more specifically the impacts to be investigated in detail;
- predicting the characteristics of the main impacts; and
- evaluating the significance of the residual impacts that cannot be mitigated.

Impact analysis is the technical heart of the EIA process. Depending on requirements, EIA trainers may focus selectively on the above phases, going only into the detail on methods and tools that is appropriate. It is expected that only those groups requiring a comprehensive introduction to impact analysis will work through the whole topic.

Review the screening and scoping phases of the EIA process linking them to the impact assessment stage of the process. (Refer as necessary to Topic 4 – *Screening* and Topic 5 – *Scoping* for information on screening and scoping).

The screening phase of the EIA determines whether or not an EIA is required for a particular proposal. The scoping phase identifies the important issues that should be investigated in detail (making sure that time and money is not wasted investigating issues that are not of concern).

The next stage of the EIA process is when a detailed assessment is undertaken to forecast the characteristics of the main potential impacts. Known as impact analysis, this stage can be broken down into three overlapping phases:

- *identification* — to specify the impacts associated with each phase of the project and the activities undertaken;
- *prediction* — to forecast the nature, magnitude, extent and duration of the main impacts; and
- *evaluation* — to determine the significance of residual impacts i.e. after taking into account how mitigation will reduce a predicted impact.

Impact identification and prediction are undertaken against an environmental baseline, often delineated by selected indices and indicators (e.g. air/ water, noise, ecological sensitivity, biodiversity). The collection of



1

Topic 6
Impact analysis

baseline information and the relevant biophysical and socio-economic conditions begins during screening and continues in scoping. Often, additional baseline data will need to be collected to establish reference points for impact identification and prediction. These requirements should be identified in the Terms of Reference.

Outline how the environment and sustainability agendas have widened the range of impacts that are usually considered during EIA beyond those that are purely biophysical. Provide brief examples of the range of impacts that are currently considered in local EIA of proposals.

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 and 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 can include 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 well being 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 (see Topic 15 –*Future directions*).



2

Impact identification

Outline the need for a systematic and reproducible method of identifying impacts and their causes. Note that this should begin during scoping. Then introduce impact identification methods and discuss each of them in turn.

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 analysed in greater detail in accordance with terms of reference specifically established for this purpose (see Topic 5 – *Scoping*).

Over time, a number of EIA methodologies and tools have been developed for use in impact identification. (Some of them are also useful tools for presenting the results of the EIA or assigning significance, as discussed later in this topic). In practice, relatively simple methodologies and tools are applied to impact identification (as compared to more complex, data-demanding methods which may be used in impact prediction). Experience indicates these simple methods are of proven value for undertaking a systematic approach to impact identification.

The most common formal methods used for impact identification are:

- checklists;
- matrices;
- networks;
- overlays and geographic information systems (GIS);
- expert systems; and
- professional judgement

Checklists

(Note that OHPs 4 and 5 should be used only to indicate the structure of checklists. If you wish to discuss these examples in detail ensure that participants have copies of Handouts 6-1 and 6-2.)



3



4

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 (such as the Battelle Environmental Evaluation System). Both simple and descriptive checklists can be improved and adapted to suit local conditions as experience with their use is gained.



6-1

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). Sectoral checklists often are useful when proponents specialise 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. An example of a sector-based checklist can be found in Handout 6-1.

Matrices



5

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.



6-2

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. An example can be found in Handout 6-2.



6

Networks

Networks illustrate the cause-effect relationship of project activities and environmental characteristics. They are, therefore, particularly useful in identifying and depicting secondary impacts (indirect, cumulative, etc). Simplified networks, used in conjunction with other methods, help to ensure that important second-order impacts are not omitted from the investigation.



6-3

More detailed networks are visually complicated, time-consuming and difficult to produce unless a computer programme is used for the task. However, they can be a useful aid for establishing 'impact hypotheses' and other structured science-based approaches to EIA. An example of an impact network can be found at Handout 6-3.

Overlays and geographic information systems

Overlays can be used to map impacts spatially and display them pictorially. The original overlay technique, popularised by McHarg, is an environmental suitability analysis in which data on topographic features, ecological values and resource constraints are mapped onto individual transparencies and then aggregated into a composite representation of potential impacts. This approach is useful for comparing site and planning alternatives, for routing linear developments to avoid environmentally sensitive areas and for landscape and habitat zoning at the regional level. Disadvantages of this approach relate to the lack of precision in differentiating the likelihood and magnitude of impacts and relating them to project actions. Also, the overlay process can become cumbersome in its original form.

A modern version of the overlay method is the computer-based geographical information system (GIS). In simple terms, a GIS stores, retrieves, manipulates and displays environmental data in a spatial format. A set of maps or overlays of a given area provide different types of information and scales of resolution. The use of GIS for EIA purposes is not as widespread as commonly imagined. The main drawbacks are the lack of appropriate data and the expense of creating a usable system. However, the potential application of GIS to EIA is widely acknowledged and its use is expected to increase in the future, particularly to address cumulative effects.

Expert systems

Expert or knowledge-based systems are used to assist diagnosis, problem solving and decision-making. A number of such computerised systems have been developed for use in EIA, primarily at the early stages of the process. For example, screening and scoping procedures have been automated using a number of rules and a data system, which encodes expert knowledge and judgement. The user has to answer a series of questions that have been systematically developed to identify impacts and determine their 'mitigability' and significance. Based on the answer given to each question, the expert system moves to the next appropriate question.

Like GIS systems, expert systems are an information-intensive, high-investment method of analysis. As such, they are limited in their current use and application, especially by many developing countries. However, they also have the potential to be a powerful aid to systematic EIA in the future, not least because they can provide an efficient means of impact

identification. Expert systems also can be updated by building in experience gained over time.

Professional judgement

Although not strictly a formal method, professional judgement or expert opinion is widely used in EIA. Knowledge and expertise gained in EIA work can be used to systematically develop data banks, technical manuals and expert systems, thereby assisting in future projects. The successful application of the formal methods of impact identification described above rests upon professional experience and judgement. Expert opinion and professional judgement can be focused by the use of interactive methods, such as Delphi techniques and science workshops, to identify impacts, model cause-effect relationships and establish impact hypotheses.

Review the factors that should be considered when choosing an impact identification method and outline how the choice could be made in a given situation.

No single impact identification methodology is suited to use on all occasions; nor is it necessary to use only one method at a time. Combining the useful aspects of two different techniques may be the best approach to take. As noted above, EIA checklists, matrices and networks can have added value when applied by experts in an interactive process. Note, also that some of the methods perform other functions that may be useful to the EIA team (e.g. the Battelle checklist can be used to determine significance).

The choice of methodology can depend upon a number of factors including:

- the type and size of the proposal;
- the type of alternatives being considered;
- the nature of the likely impacts;
- the availability of impact identification methods;
- the experience of the EIA team with their use; and
- the resources available – cost, information, time, personnel.

A word of caution

When using impact identification methods (such as checklists or matrices) developed by others, care should be taken to ensure that these are suitable for your purpose. A summary of the main advantages and disadvantages of these methods is given in the table below. In reviewing them, particular attention should be given to environmental features that are distinctive or extreme to the region in which the project is proposed (e.g. flood, drought, temperature, seismic activity, land instability, disease vectors, etc).



7

Table 1: Main advantages and disadvantages of impact identification methods

	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
Matrices	• link action to impact • good method for displaying EIA results	• difficult to distinguish direct and indirect impacts • have potential for double-counting of impacts
Networks	• link action to impact • 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

Impact analysis/prediction

Provide a general introduction to the analysis and prediction of impacts. Note that predictive studies often require expert knowledge.

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 utilises physical, biological, socio-economic and cultural data to estimate the likely characteristics and parameters of impacts (e.g.

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Impact analysis

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. Examples of commonly used impact prediction tools are given in Table 1.

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 programme 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.

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 summarised in appropriate form, for example, maps, cross-sections and/or photomontages.

Briefly discuss the interaction that must occur among those undertaking the impact studies and between these people and the project designers and managers.

In most cases, an 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 organising 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.

(For further information on EIA project management refer to Topic 12 – *EIA project management*.)

Discuss the use of baseline studies and data collection. Show examples from local projects that have been well managed, and illustrate the importance of baseline data in EIA and project decision making.

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 analysed 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 foreseeable proposals.

In practice, assembling baseline information can be time consuming and expensive. There can be difficulties in collecting appropriate and sufficient information. For example, there may be unforeseen circumstances in which the collection of data cannot be completed as required by the Terms of Reference. In such cases, the EIA team may have to revise the study strategy and/or use their judgement to make predictions. When this occurs it should be indicated in the EIA report with a short explanation of the reasons.

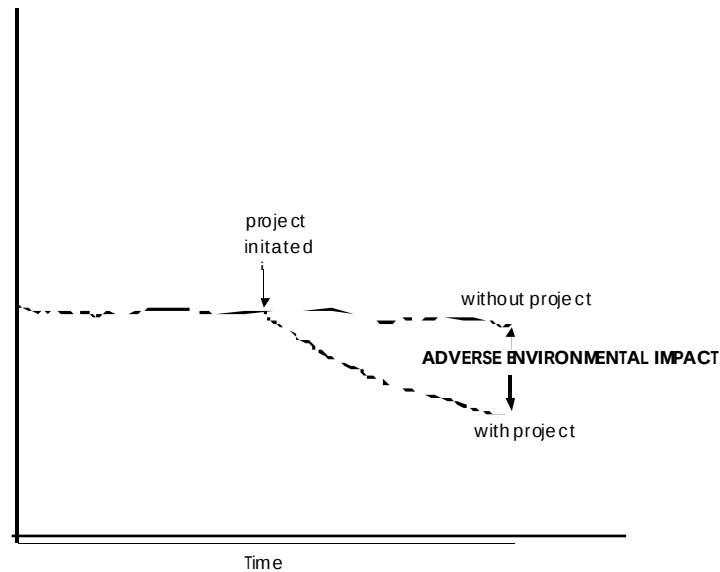
Specialised knowledge is usually required to oversee, and, where necessary, set limits on the collection of data required for impact analysis and monitoring. EIA project managers also need to ensure that time and effort is not spent on unnecessary data collection or that excessive space in the EIA report is not occupied by a description of baseline conditions. For example, the baseline chapter or section could be limited to not more than ten per cent of the total number of pages in the report. This issue is discussed further in Topic 8 – *Reporting*.



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Source: Wathern (1988)

Figure 1: An environmental impact

Briefly define the word 'impact'. Outline the characteristics of impacts and discuss how these characteristics vary, noting their importance in prediction and decision-making. Emphasise that impacts can be positive or beneficial as well as adverse and that both types should be brought to the notice of decision-makers.

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.

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;



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- 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. This concept is discussed further later in this topic.



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Table 2: Impact characteristic summary table

IMPACT CHARACTERISTIC	IMPACT TYPE		
	air quality	health	etc.
nature			
magnitude			
extent/location			
timing			
duration			
reversibility			
likelihood (risk)			
significance			



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Presentation of impact results

When preparing the EIA report a systematic format should be used to present information about impacts to decision-makers. The organisation and display of information is an integral part of certain predictive methodologies, such as the Battelle Environmental Evaluation System. In other cases, this framework may need to be designed separately. One possible format is an impact characteristic summary table above. Finally, reference should be made to the confidence limits in impact data, in

probabilistic terms for quantitative judgements (e.g. 95 per cent) or in relative terms for qualitative judgements (reasonably high, best estimate, etc.).

Outline the range of methods that can be used in impact prediction, drawing attention to any local requirements at the appropriate stage of the discussion.



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Methods for predicting the characteristics of impacts include:

- 'best estimate' professional judgement;
- quantitative mathematical models;
- experiments and physical models; and
- case studies as analogues or points of reference.

These are discussed in general below. Specific examples of the use of predictive techniques can be found in the references listed at the end of this topic.

Professional judgement

As noted earlier, all methods of analysis involve professional judgement and the use of advanced tools and models will require expert knowledge.

Sole reliance on 'best estimate' professional judgement may be unavoidable when there is a lack of data to support more rigorous analyses or there is a lack of predictive methodology (as in the analysis of certain social impacts). Examples include the prediction of the effect of a water supply proposal on:

- the activities of women or community interaction; and
- the loss of a communal place or sacred site.

Such predictions should be made by specialists, who are familiar with the type of proposal, the geographic region and/or similar cases that are analogous to the situation. Where professional judgement is used without also employing other methods, the judgement and values of the specialist concerned may be open to challenge. Peer review and the use of agreed concepts and frameworks can be useful to corroborate findings.

Quantitative mathematical models

Quantitative models express cause-effect relationships as mathematical functions, derived from deterministic or probabilistic relationships. A number of such models are used in EIA to predict certain types of impacts, for example, on air, water, soil and habitat. More complex computer-based simulations are data demanding and often their use in EIA requires certain simplifying assumptions to be made.

The choice and use of quantitative models for impact prediction should be suited to the particular cause-effect relationship being studied; for example,

transport and fate of oil spills, sediment loadings and fish growth and pesticide pollution of groundwater aquifers. Attention also needs to be given to the consistency, reliability and adaptability of models. Usually operational changes are made to the input conditions for the model to see how the outputs are affected. For instance, differences in air pollution can be calculated by changing the height of a stack or the rate of output of emissions.

Examples of the use of quantitative models include:

- air dispersion models to predict emissions and pollution concentrations at various locations resulting from the operation of a coal-fired power plant;
- hydrological models to predict changes in the flow regime of rivers resulting from the construction of a reservoir; and
- ecological models to predict changes in aquatic biota (e.g. benthos, fish) resulting from discharge of toxic substances.

Although traditionally this type of analysis has been carried out for physical impacts, there is increasing use of mathematical models to analyse biological, social/demographic and economic impacts.

When interpreting the results of quantitative mathematical models it should be remembered that all models are simplifications of the real world. They require the specialist to make a number of assumptions in both their development and their use. If these assumptions are inappropriate then there can be significant implications for the accuracy and usefulness of the output data. EIA project managers should ask all specialists carrying out mathematical analyses to clearly state the assumptions inherent in the use of their models, together with any qualifications to be placed on the results.

Experiments and physical models

Experiments and scale models can be used to test and analyse the effects of project-related activities and the effectiveness of proposed mitigation techniques. These methods have not been used extensively in impact prediction. However, they can be appropriate, depending upon the nature of the impact and the resources available, and providing certain cautions are remembered. When using the results of experiments or models, note that unpredicted outcomes can occur when the data are 'scaled up' to life size.

Experiments can be undertaken directly in the field or under laboratory conditions. Examples of their use include:

- the exposure of fish in a laboratory to concentrations of pollutants to determine mortality levels; and
- field trials of the effectiveness of different methods of erosion control.

Physical models can be built to predict the behaviour and effect of the actual project on the environment. For example, a physical model could be used to

simulate changes to patterns of sand or sediment deposition resulting from port and harbour works.

Case studies

Reviewing case studies of projects in similar environments can inform and assist impact prediction and analysis. Comparisons will be especially helpful if impact monitoring and auditing data are available. Otherwise, the results obtained by a comparable use of EIA methodology should be consulted. Sometimes, relevant case material will not be readily accessible or available. In that event, there is a large body of general information on the impact 'footprints' of major types of projects, such as dams, roads, airports and power stations. However, this should be read with care as to its source and provenance.

Briefly discuss the importance of uncertainty in EIA and consider the value of undertaking a sensitivity analysis as part of the analysis of the impacts.

Uncertainty is a pervasive issue at all stages of the EIA process but is especially important for impact prediction. Put simply, uncertainty is a state of relative knowledge or ignorance. Where cause-effect relationships are 'known' and understood, however imperfectly, impacts can be forecast (or at least described). Certain impacts are unknown until they occur; for example, ozone depletion caused by release of CFCs and inter-species transmission of the human variant of Bovine Spongiform Encephalopathy (BSE) or 'mad cow' disease.

Sources of uncertainty in impact prediction include:

- *scientific uncertainty* – limited understanding of an ecosystem (or community) and the processes that govern change;
- *data uncertainty* – restrictions introduced by incomplete or non-comparable information, or by insufficient measurement techniques; and
- *policy uncertainty* – unclear or disputed objectives, standards or guidelines for managing potential hazards and effects.

There are a number of approaches that can be used to address uncertainty in impact prediction, including:

- 'best' and 'worst' case prediction to illustrate the spread of uncertainty;
- attaching confidence limits to impact predictions; and
- sensitivity analysis to determine the effect of small changes in impact magnitude.

The relationship between impact, size and severity may not be linear. Small changes in impact magnitude may cause larger than expected increases or



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decreases in the severity of environmental change. Where necessary, an assessment should be made of the effect that small changes in the magnitude of the impact (say less than 10 per cent) have on the environment, particularly if significant or valued resources are potentially affected. This is referred to as a sensitivity analysis.

Briefly discuss the types of considerations introduced into impact analysis by three of the non-biophysical impacts frequently considered during integrative EIA – social, health and economic.

A broader range of impacts and interrelationships are now routinely integrated into EIA. These include the social, economic and health aspects of environmental change. In comparison to biophysical impacts, less experience has been gained in analysing these and other non-biophysical impacts. However, this situation is changing. The discussion below serves as a brief introduction to social, health and economic impacts. For more detailed coverage of the analysis of these and other impacts refer to the references listed at the end of this chapter.

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 analysed 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 organise 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 well being.

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 artefacts and to structures and environmental features with religious or ritual significance;
- *community impacts* including changes in social structures, organisations and relationships and their accompanying effect on cohesion, stability, identity and provision of services; and



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- *socio-psychological impacts* including changes to individual quality of life and well being, 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. However, it should be emphasised that there is little consensus on the social impacts that should be included as part of an EIA process. Other than agreeing that the scope is too limited, SIA practitioners themselves differ on the aspects to be studied and the framework within which they should be analysed. Further information on this subject can be found in Topic 13 – *Social Impact Assessment*.

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 favourable 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 Organisation, the World Bank and other international agencies recommend that, where necessary and appropriate, HIA should be integrated with the EIA process. Both use similar information, approach and methods; for example, when identifying the health and environmental impacts of exposure to air particulate emissions from a proposed power plant.

Table 3: Examples of health impacts by sector

	Communicable disease	Non communicable disease	Nutrition	Injury	Psychosocial disorder and loss of well-being
Mining	Tuberculosis	Dust induced lung disease		Crushing	Labour migration
Agriculture	Parasitic infections	Pesticide poisoning	Loss of subsistence		
Industry		Poisoning by pollutants		Occupational injury	Disempowerment
Forestry			Loss of food production	Occupational injury	
Dams and irrigation schemes	Water borne diseases	Poisoning by pollutants	Increased food production	Drowning	Involuntary displacement
Transportation	HIV / Aids	Heart disease		Traffic injury	Noise and induced stress
Energy		Indoor air pollution		Electromagnetic radiation	Community displacement

Source: Birley draft materials prepared for World Health Organisation (2000)



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Certain proposals can also increase the risk of accidental death and injury to the workforce and the public. Examples of occupational and public health and safety issues include exposure to increased traffic levels introduced by road building or to dangerous and hazardous industries, such as those involving the processing, storage and/or transportation of flammable materials or toxic gases. In these situations, a risk assessment should be undertaken as part of an EIA to determine the probability of an accident or malfunction occurring and the likely consequences.

The table above illustrates some of the health hazards and impacts associated with development proposals from different sectors.

Economic and fiscal impacts

Invariably, the economic feasibility of a major proposal will be subject to cost-benefit analysis (CBA). In addition, specific economic and fiscal impacts of a development proposal may need to be considered as part of the EIA process, for example where they have a direct bearing on social and health impacts.

Typically, economic impact assessment is carried out to predict project-related changes in employment (e.g. new job requirements in relation to the local labour market), per capita income (e.g. locally retained versus exported remittances) and levels of business activity (e.g. positive and negative effects of the project on local enterprises). Often, economic impacts cause social

impacts, for example, if there is a large influx of temporary workers into a local community during the project construction phase of project development. Such 'boomtown' conditions may threaten community cohesion and health and strain services and access to them by local residents.

Fiscal impacts accrue from changes in the costs and revenues of the various government sectors. These changes typically occur as the result of a proposal causing relatively large increases in population and the requirement for additional capital expenditures on local infrastructure and facilities provided by government (e.g. health services, roads, sewerage etc.). A common issue is that of 'front-end financing' – i.e., whether or not expenditures will increase quicker than revenues in the early phase of project implementation.

If that happens, it creates deficit and cash flow difficulties, often with resulting shortfalls or 'bottlenecks' in the provision of basic services. This leads, in turn, to the overloading of infrastructure, such as water supply and sewerage, and consequent environmental and social impacts. Resolving these problems can be especially difficult if the revenues from a project are received in one jurisdiction and the costs are borne in another.

The factors that typically affect economic and fiscal impacts are identified in the box below. A number of methods can be used to predict these impacts. For economic impacts, these include input-output and export-base models, which incorporate an income and employment multiplier to estimate the extra money that is injected and spent in the local economy, adjusting for any 'leakages'. The methods that can be employed for fiscal impact assessment differ substantially in the scope of costs and revenues addressed.

Box 1: Factors affecting economic and fiscal impacts

Factors affecting economic impacts:

- duration of construction and operational periods
- workforce requirements for each period and phase of construction
- skill requirements (local availability)
- numbers employed and earnings
- raw material and other input purchases
- capital investment
- outputs
- the characteristics of the local economy

Factors affecting fiscal impacts:

- size of investment and workforce requirements
- capacity of existing service delivery and infrastructure systems
- local/regional tax or other revenue raising processes
- likely demographic changes arising from project requirements (these need to be estimated during the assessment of social impacts)



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Evaluation of impact significance

(Note: Impact significance is also discussed in Topic 4 – Screening and Topic 5 – Scoping. These are the processes of identifying, respectively, whether or not and at what level EIA should be applied and which impacts require further investigation.)

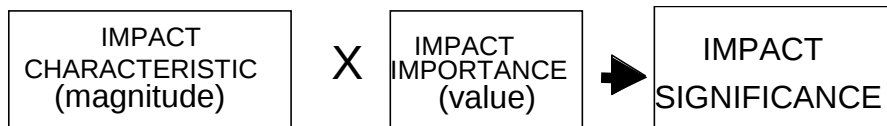


Figure 2: Calculating impact significance

Outline the importance of determining significance and discuss the approaches that can be used in impact evaluation.

Once the impacts have been analysed, 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 'as predicted' impacts to define the requirements for mitigation and other remedial actions (discussed in Topic 7 – *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 (see Figure 2).

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 judgement 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.

However, this latter task overlaps with the responsibility of the decision-maker. The environmental acceptability of a proposal and the terms and conditions to be attached to its implementation must be weighed against

other economic and social factors by the decision-maker. Further information can be found in Topic 10 – *Decision-making*.

Discuss the criteria and measures of significance that are available and how they can be adapted to local application and use.

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.

EIA guidelines related to significance fall into two main categories:

- emissions based, comprising standards for air and water quality, noise etc.
- environmental quality based, comprising significance criteria for valued ecosystem components or similar attributes.

Emissions based standards will be jurisdiction specific (although certain standards may be internationally recognised) and provide an objective, technical means of determining significance; for example the anticipated residual impacts either do or do not exceed the relevant standard. However, reliance on standards suffers from certain deficiencies and limitations. The relevant technical standard may be the subject of disagreement or public concern (e.g. blood lead levels, traffic noise levels, electromagnetic field strengths). In many cases, an appropriate technical standard will not be available for the evaluation of significance (e.g. ecological, social and visual impacts).

Environmental quality based criteria or thresholds are qualitative, broadly drawn and require interpretation. In this context, impact evaluation is a subjective exercise, linking scientific criteria to social preferences (as discovered through public involvement or SIA methods) and relating them to the environment and community affected. Some of the impact identification techniques discussed earlier in this topic have built in scales or weightings (and hence values) based on prior experience. When applying them, the criteria should be modified to take account of local value systems and traditional practices.

Additionally, some countries and international agencies have established environmental sustainability criteria and environmental acceptability rules against which evaluation can be conducted. For example, the World Bank input and output guidelines are meant to ensure that each project does not exceed the regenerative and assimilative capacities of the receiving environment (see the box below). In practice, as the Bank acknowledges, there is considerable difficulty in applying these guidelines and it has

augmented them with other environmental and social safeguards. Rules for environmental acceptability and their relationship to significance thresholds based on Western Australian experience are described in the companion box below.

Box 2: World Bank guidelines for environmental sustainability

Environmental Aspects of Bank Work, (OMS 2.36), para 9(a) states:

The Bank endeavours to ensure that each project affecting renewable natural resources (e.g., as a sink for residues or as a source of raw materials) does not exceed the regenerative capacities of the environment.

Output Guide

Waste emissions from a project should be within the assimilative capacity of the local environment to absorb without unacceptable degradation of its future waste absorptive capacity or other important services.

Input Guide

Harvest rates of renewable resource inputs should be within regenerative capacity of the natural system that generates them; depletion rates of non-renewable resource inputs should be equal to the rate at which renewable substitutes are developed by human invention and investment.

Source: World Bank 1991



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Box 3: Examples of threshold tests for environmental acceptability

Level of acceptability	Potential impact threshold
Unacceptable	Exceeds legal threshold, e.g. quality standard
Unacceptable	Increases level of risk to public health and safety above qualitative or quantitative criteria (e.g. in some jurisdictions an increased risk of death of 1 in a million per year)
Unacceptable	Extinction of biological species, loss of genetic diversity, rare or endangered species, critical habitat
Normally unacceptable	Conflict with existing environmental policies, land-use plans
Normally unacceptable	Loss of populations of commercial biological species
Normally unacceptable	Large-scale loss of productive capacity of renewable resources

May be acceptable only with minimization, mitigation, management	Avoidance of spread of biological disease, pests, feral animals, weeds
May be acceptable only with minimization, mitigation, management	Taking of rare or endangered species
May be acceptable only with minimization, mitigation, management	Some loss of threatened habitat
Normally acceptable	Some loss of populations and habitats of non-threatened species
Normally acceptable	Modification of landscape without downgrading special aesthetic values
Normally acceptable	Emissions demonstrably less than the carrying capacity of the receiving environment

Source: Sippe 1999

Aids and principles for evaluating significance



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Key reference points for evaluating significance include:

- environmental standards, guidelines and objectives;
- level of public concern (particularly over health and safety);
- scientific and professional evidence for:
 - loss/disruption of valued resource stocks and ecological functions;
 - negative impact on social values, quality of life and livelihood; and
 - foreclosure of land and resource use opportunities.



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Guiding principles for determining significance include:

- use procedure and guidance established by the jurisdiction;
- adapt other relevant criteria or identify points of reference from comparable cases;
- assign significance in a rational, defensible way;
- be consistent in the comparison of alternatives; and
- document the reasons for the judgements made.



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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 high, moderate or low?

Significance criteria

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

- environmental loss and deterioration;



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- 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.



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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 that have 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.



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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
- approved or statutory plans that protect areas or allocate, zone or regulate the use of land and natural resources.



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Probability and acceptability of risk

Risk-based principles may be used to establish 'rules of thumb' for the acceptability of effects. For example, a statistical threshold of significance may be established to define an acceptable incidence of disease per million

people exposed to a specified hazard (e.g. carcinogenic chemical). This approach is often controversial. It is important to document why and how the level and acceptability of risk has been determined.

A risk-based approach can be useful to address the significance of cumulative effects and ecosystem level changes. Typically, a quantitative risk assessment will not be possible because of lack of knowledge of the variability of natural systems. However, qualitative rules of thumb may be set for cumulative loss or change; for example limiting drainage of wetlands to no more than 25 per cent of the area or some other proportion considered to be significant for maintaining their essential functions of flow regulation, aquatic and bird habitat etc.

Review any guidance available on good practice applying the test of significance to see if it is relevant to local use and application.

The following points summarise international experience on what works well when undertaking evaluation of significance:

- easy-to-use and explain criteria, e.g. health and safety standards;
- criteria that are widely agreed, e.g. threats to rare and endangered species or protected areas; and
- approaches that focus evaluation of significance, including 'references' to cases that are comparable to the proposal.

By contrast, references to biodiversity, sustainability rules and carrying capacity are less easy to justify, more open to argument. However, given their increasing significance, this is an evident area for further work and clarification in guidance on impact evaluation. A list of the types of evaluation criteria that might be used (or adapted) as the starting point for developing sustainability criteria can be found in Boxes 2 and 3.

The approach taken to evaluate significance should reflect the uncertainty and controversy that characterises a specific proposal, for example:

- apply technical criteria when the likely changes associated with a proposal can be predicted with reasonable accuracy e.g. standards, environmental quality criteria and risk assessment of certain health impacts; and
- use a negotiation process when factual information is limited and there is a high degree of uncertainty and/or controversy regarding potential impacts (involving experts or affected or interested parties).

In practice, impacts are likely to be significant if they:

- are extensive over space or time;
- are intensive in concentration or in relation to assimilative capacity;
- exceed or approximate to environmental standards or thresholds;



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- do not comply with environmental policies, land use plans, sustainability strategy;
- affect ecological sensitive areas and heritage resources; and
- affect community lifestyle, traditional land uses and values.

Briefly discuss the role of mitigation and other steps in the EIA process that relate to the management of significant impacts.

Topic 7 – *Mitigation and impact management* discusses the importance of avoiding, minimising and remedying the potential effects of a proposal.

The test of significance introduced in this topic is applied to residual impacts after mitigation measures have been taken into account. It first requires a technical judgement to be made of the extent to which predicted impacts will be reduced by the action to be taken.

Include a training activity to reinforce the topic (if desired).

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

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The following references have been adapted or used as a primary source for major parts of this topic.

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Taylor N, Goodrich C and Bryan H (1998) Social Assessment in Porter A and Fittipaldi J (eds) (1998) *Environmental Methods Review: Retooling Impact Assessment for the New Century* (pp. 210-218). The Press Club, Fargo, USA.

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Further reading

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Petts J (1999) (ed) *Handbook of Environmental Impact Assessment*. Volume 2 Blackwell Science Ltd. Oxford, UK.

Porter A and Fittipaldi J (eds) (1998) *Environmental Methods Review: Retooling Impact Assessment for the New Century*. The Press Club, Fargo, USA.

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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

Impact identification

- 6-1 What are the strengths and weaknesses of the different types of impact identification methods used locally?
- 6-2 What issues would need to be taken into account if complex or computer-aided EIA methods were used to identify impacts?
- 6-3 Chemicals used in pesticides accumulate in living tissue and are found in the breast milk of mothers in cities that are a long way from agricultural areas. What methods could be used to identify such indirect impacts?

Impact prediction

- 6-4 EIA is supposed to predict the impacts of a particular proposal. To what extent does the process involve assumptions and value judgements and how should these be made?
- 6-5 What are the possible consequences of not carrying out a baseline study?
- 6-6 Critique the following statements from EIA reports, indicating, as necessary, what additional information is needed to justify or qualify them:
 - a) The dam will flood the habitat of 40 nesting pairs of raptors. This will be an insignificant impact.
 - b) The impact on demand for health services by the project workforce (estimated to be 250 for a one-year period) will not be of major significance.
 - c) An increase in the permanent local population by 200 families due to the fact that the project will not cause a significant impact on infrastructure.

Impact significance

- 6-7 Discuss the difference between determining significance and decision-making.

- 6-8 Who should be responsible for determining significance? What principles/criteria can or should be used locally as the basis of determining the significance of different impacts?
- 6-9 Discuss the following statement: 'The standard says that the allowable discharge limit is 5ml per 100 litres. There's no value judgement in that'.
- 6-10 What tests/methods could be applied locally to systematically evaluate significance?

Speaker themes

- 6-1 Invite a speaker who is experienced in managing local EIAs to discuss the various approaches/methodologies that have been used to identify impacts and how they could be improved in future work. The presentation should be supported by examples of the work.
 - 6-2 Invite a speaker who has experience with GIS or predictive models to show the participants how they work and what they can be used for. Ensure that some of the discussion covers the data requirements for the method and that note is made of any limitations.
 - 6-3 Invite a speaker to outline an applicable procedure to determine significance, together with any criteria and methods used that are of relevance to the group of participants.
-

Group Activity 6–1: Impact Analysis—Impact identification

Title: Using impact identification methods

Aim: To gain an understanding of the strengths and weaknesses of the different methods of impact identification that are available.

Group size: Four to six people

Duration: Half to one day, depending on the desired level of detail.

Resources required:

- ☐ Background information from local project(s).
- ☐ Examples of checklists, matrices etc. that can be used or adapted for use for the candidate project(s).
- ☐ List of criteria that could be used to evaluate different impact identification methods, e.g. ease of use, general coverage, ability to identify indirect impacts etc.

Description of activity:

- ☐ Get the group as a whole to adapt/develop the list of criteria to be used to evaluate the impact identification methods.
- ☐ Assign each group the task of using one of the methods (matrix, checklist etc) to identify the impacts for a project.
- ☐ Get each group to evaluate the method using the list of criteria established earlier.
- ☐ Get each small group to present to the group as a whole a summary of the identification method they used, any problems that they encountered, the impacts they identified and how the method rated using the evaluation criteria.

Group Activity 6–2: Impact analysis—Impact identification

Title: Using a Leopold type matrix

Aim: To give the participants a 'hands-on' understanding of how to apply a matrix and the results that are obtained.

Group size: Four to six people

Duration: Half to one day, depending on the level of detail.

Resources required:

- ☐ Background information from local case study project(s).
- ☐ Modified Leopold Matrix (obtain one used locally if possible).
- ☐ Copies of handout overpage 'Using a Leopold Matrix'

Description of activity:

- ☐ Using the matrix, identify all actions that are part of the project (from the horizontal axis).
- ☐ For each action, work down the list of environmental characteristics and place a diagonal line in all of those where an impact is possible.
- ☐ For each cell containing a diagonal line rank the magnitude of the impact on a scale from 1 (least) to 10 (most) and place the rank in the top left corner of the cell (a plus (+) may be used for positive impacts and a minus (-) can be used for negative impacts).
- ☐ In the lower right hand corner of each cell place a number from 1 (least) to 10 (most) to indicate the importance of the impact (this importance weighting should be determined using an acceptable group process).
- ☐ Provide a written report on the most significant impacts to accompany the table.
- ☐ As a whole group, review the success of using the matrix.

Using a Leopold-type matrix

Modified Leopold Matrix	
Environmental Effects Development	SOCIAL ENVIRONMENT
	Public participation Employment Settlement Land value Existing land uses Risks and anxieties Personal and social values Historical/cultural Landscape/visual Recreation
Treatment	
Comminution	
Sedimentation	
Milliscreening	
Oxidation ponds	
Activated sludge	
Trickling filter	
Nutrient removal	
Chlorination	
Further treatment offsite	
Disposal - Land	
Rapid infiltration	
Surface flooding	
Spray irrigation	
Disposal - Inland Water	
River	
Lake	
Disposal - Marine Water	
Estuary	
Inshore marine	
Offshore marine	
Deep well injection	

The steps in using a Leopold-type matrix are:

- identify all actions that are part of the project (across top of table);
- for each action, work down the list of environmental characteristics and place a diagonal line in all of those where an impact is possible;
- for each cell containing a diagonal line rank the magnitude of the impact on a scale from 1 (least) to 10 (most) and place the rank in the top left corner of the cell (a plus (+) may be used for positive impacts and a minus (-) can be used for negative impacts);
- in the lower right hand corner of each cell place a number from 1 (least) to 10 (most) to indicate the importance of the impact (this importance weighting should be determined using an acceptable group process); and
- provide a written report on the most significant impacts.

Group Activity 6–3: Impact analysis—Impact identification

Title: Identifying secondary impacts

Aim: To raise awareness of the importance of assessing secondary (indirect and cumulative) impacts.

Group size: Four to six people

Duration: Two hours

Resources required:

- ☐ Background information for a local project, particularly the project description and a list of direct impacts.
- ☐ A profile of the environment and community affected, including designated and sensitive areas, and land use.
- ☐ Information on other proposed activities.

Description of activity:

- ☐ Examine the project details and list of direct impacts.
 - ☐ Consider what potential is there for regional, national, trans-boundary and global impacts.
 - ☐ Consider what potential is there for indirect and cumulative impacts from the project.
 - ☐ As a whole group discuss both the implications of not assessing these impacts for this project and possible effects if they are not assessed for a series of similar projects.
-

Group Activity 6–4: Impact analysis—Baseline data

Title: Planning for baseline data collection

Aim: To provide an appreciation of the role and importance of collecting baseline data.

Group size: Four to six people

Duration: Half to one day, depending on the level of detail required by participants.

Resources required:

- ☐ Background information for a local project that includes a plan (or can be used to develop one) for baseline data collection.
- ☐ Checklist or matrix appropriate for use to identify the impacts of the project.

Description of activity:

- ☐ Given the project description, use the checklist or matrix to identify the major impacts that require further analysis.
- ☐ For each impact, list the types of baseline data that could be required and identify any sources that may already exist for obtaining the information.
- ☐ Compare the strengths and weaknesses of the list that the groups have developed with that developed for the actual project (where available).

Group Activity 6–5: Impact analysis—Significance

Title: Review of determination of significance.

Aim: To gain familiarity with procedure and criteria for evaluating and determining impact significance.

Group size: Pairs

Duration: Half-day

Resources required:

- ☐ An EIA report for each pair

Description of activity:

Each pair is to:

- ☐ review the EIA report, listing the major impacts that were analysed;
- ☐ for each major impact, identify the significance procedure and/or criteria by which the impact was evaluated; and
- ☐ summarise the strengths and weaknesses of the approach and the way the findings were reported.

The whole group should convene to discuss the findings.



1

The 'impact analysis' or detailed study phase of EIA involves:

- identifying the impacts more specifically
- predicting the characteristics of the main impacts
- evaluating the significance of the residual impact



2

The term 'environment' includes:

- human health and safety
- flora, fauna, ecosystems and biodiversity
- soil, water, air, climate and landscape
- use of land, natural resources and raw materials
- protected areas and sites of special significance
- heritage, recreation and amenity assets
- livelihood, lifestyle and well being of affected communities



3

Impact identification methods:

- checklists
- matrices
- networks
- overlays and geographic information systems (GIS)
- expert systems
- professional judgement



4

Example of a checklist

Aspects of EIA	Check list Questions Will the project:	Yes	No	Additional Data needed
Sources of Impacts	1. Require the acquisition or conversion of significant areas of land for residential or commercial use etc. (eg. >50 ha rural, >5ha urban)?	☐	☐	☐
	2. Result in significant quantities of eroded material, effluent or solid wastes?	☐	☐	☐
	3. Require significant accommodation or service amenities to support the workforce during construction (eg. >100 manual workers)?	☐	☐	☐
Receptor of Impacts	4. Flood or otherwise affect areas which support conservation worthy terrestrial or aquatic ecosystems, flora or fauna (eg. protected areas, wilderness areas, forest reserves, critical habitats, endangered species); or that contain sites of historical or cultural importance?	☐	☐	☐
	5. Flood or otherwise affect areas which will affect the livelihoods of local people (eg. require population resettlement, affect local industry, agriculture, livestock or fish stocks, reduce the availability of natural resource goods and services)?	☐	☐	☐
	6. Involve siting sanitation treatment facilities close to human settlements (particularly where locations are susceptible to flooding)?	☐	☐	☐
	7. Affect sources of water extraction?	☐	☐	☐
Environmental Impacts	8. Cause a noticeable permanent or seasonal reduction in the volume of ground or surface water supply?	☐	☐	☐
	9. Present a significant pollution risk through liquid or solid wastes to human settlements, sources of water extraction, conservation worthy aquatic ecosystems and species, or commercial fish stocks?	☐	☐	☐
	10. Change the local hydrology of surface water-bodies (eg. streams, rivers, lakes) such that conservation-worthy or commercially significant fish stocks are affected?	☐	☐	☐
	11. Increase the risk of diseases in areas of high population density (eg. onchocerciasis, malaria, hepatitis, gastrointestinal diseases)?	☐	☐	☐
	12. Induce secondary development, eg. along access roads, or in the form of entrepreneurial services for construction and operations activities?	☐	☐	☐
Mitigation Measures	13. Be likely to require mitigation measures that may result in the project being financially or socially unacceptable?	☐	☐	☐
Comments				
I recommend that the programme be assigned to Category ☐				
Signature: Delegation Desk				



5

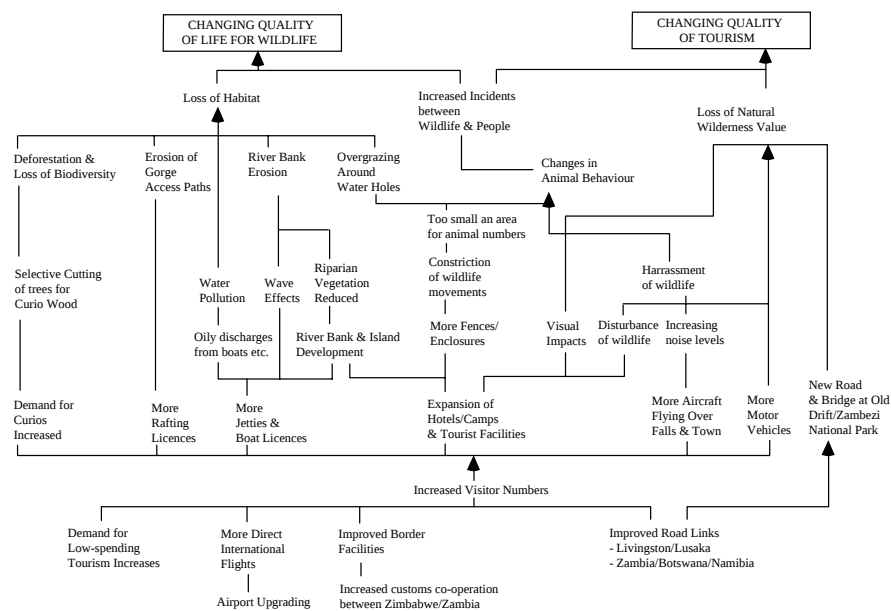
Example of Leopold type matrix

Modified Leopold Matrix	
Environmental Effects	SOCIAL ENVIRONMENT
	Public participation Employment Settlement Land value Existing land uses Risks and amenities Personal and social values Historical/cultural Landscape/visual Recreation
Development	
Treatment	
Comminution	
Sedimentation	
Millscreening	
Oxidation ponds	
Activated sludge	
Trickling filter	
Nutrient removal	
Chlorination	
Further treatment offsite	
Disposal - Land	
Rapid infiltration	
Surface flooding	
Spray irrigation	
Disposal - Inland water	
River	
Lake	
Disposal - Marine water	
Estuary	
Inshore marine	
Offshore marine	
Deep well injection	



6

A network



Network Showing Impact Linkages Leading to Changes in Quality of Life, Wildlife and Tourism (arising from increased visitor numbers) (Bisset)



7

Choice of EIA method depends on:

- the type and size of the proposal
- the type of alternatives being considered
- the nature of the likely impacts
- the availability of impact identification methods
- the experience of the EIA team with their use
- the resources available - cost, information, time, personnel



8

Main advantages and disadvantages of impact identification methods

	ADVANTAGES	DISADVANTAGES
Checklists	• simple 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
Matrices	• link action to impact • good method for displaying EIA results	• difficult to distinguish direct and indirect impacts • significant potential for double-counting of impacts
Networks	• link action to impact • 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 • good display method • good siting tool	• address only direct impacts • do not address impact duration or probability
GIS and computer expert systems	• excellent for impact identification and analysis • good for 'experimenting'	• heavy reliance on knowledge and data • often complex and expensive



9

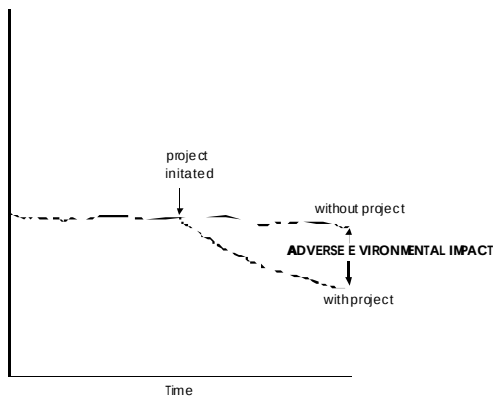
Information required about the environment to establish baseline conditions:

- current conditions
- current and expected trends
- effects of proposals already being implemented
- effects of other proposals yet to be implemented



10

An environmental impact



(Wathern, 1988)



11

Impact characteristics can vary in:

- nature (positive/negative, direct/indirect)
- magnitude (severe, moderate, low)
- extent/location (area/volume covered, distribution)
- timing (during construction, operation etc, immediate, delayed)
- duration (short term/long term, intermittent/continuous)
- reversibility/irreversibility
- likelihood (probability, uncertainty)
- significance (local, regional, global)



12

Impact characteristic summary table

IMPACT CHARACTERISTIC	IMPACT TYPE		
	air quality	health	etc
nature			
magnitude			
extent/location			
timing			
duration			
reversibility			
likelihood (risk)			
significance			



13

Methods of impact prediction:

- 'best estimate' professional judgement
- quantitative mathematical models
- experiments and physical models
- case studies as analogues or references



14

Types of uncertainty in impact prediction

- scientific uncertainty
 - limited understanding of the ecosystem or community affected
- data uncertainty
 - incomplete information or insufficient methodology
- policy uncertainty
 - unclear or disputed objectives or standards



15

Types of social impact

- demographic
 - changes to population numbers, distribution
- cultural
 - changes to customs, traditions and values
- community
 - changes to cohesion, relationships etc.
- socio-psychological
 - changes to quality of life and well being

Examples of health impacts by sector



16

	Communicable disease	Non communicable disease	Nutrition	Injury	Psychosocial disorder and loss of well-being
Mining	Tuberculosis	Dust induced lung disease		Crushing	Labour migration
Agriculture	Parasitic infections	Pesticide poisoning	Loss of subsistence		
Industry		Poisoning by pollutants		Occupational injury	Disempowerment
Forestry			Loss of food production	Occupational injury	
Dams and irrigation schemes	Water borne diseases	Poisoning by pollutants	Increased food production	Drowning	Involuntary displacement
Transportation	HIV/Aids	Heart disease		Traffic injury	Noise and induced stress
Energy		Indoor air pollution		Electromagnetic radiation	Community displacement



17

Factors affecting economic impacts

- duration of construction and operation
- workforce requirements for each period
- skill requirements (local availability)
- earnings
- raw material and other input purchases
- capital investment
- outputs
- the characteristics of the local economy



18

Factors affecting fiscal impacts

- size of investment and workforce requirements
- capacity of existing service delivery and infrastructure systems
- local/regional tax or other revenue raising processes
- demographic changes arising from project requirements



19

Box 3: Examples of threshold tests for environmental acceptability	
Level of acceptability	Potential impact threshold
Unacceptable	Exceeds legal threshold, e.g. quality standard
Unacceptable	Increases level of risk to public health and safety above qualitative or quantitative criteria (e.g. some jurisdictions an increased risk of death of 1 in a million per year)
Unacceptable	Extinction of biological species, loss of genetic diversity, rare or endangered species, critical habitat
Normally unacceptable	Conflict with existing environmental policies, land-use plans
Normally unacceptable	Loss of populations of commercial biological species
Normally unacceptable	Large-scale loss of productive capacity of renewable resources
May be acceptable only with minimization, mitigation, management	Avoidance of spread of biological disease, pests, feral animals, weeds
May be acceptable only with minimization, mitigation, management	Taking of rare or endangered species
May be acceptable only with minimization, mitigation, management	Some loss of threatened habitat
Normally acceptable	Some loss of populations and habitats of non-threatened species
Normally acceptable	Modification of landscape without downgrading special aesthetic values
Normally acceptable	Emissions demonstrably less than the carrying capacity of the receiving environment
Source: Spence 1999	



20

Key elements for assessing impact significance:

- environmental standards
- level of public concern
- scientific and professional evidence concerning:
- resource loss/ecological damage
- negative social impacts
- foreclosure of land and resource use options



21

Guiding principles for determining impact significance:

- use established procedure or guidance
- adapt relevant criteria or comparable cases
- assign significance rationally and defensibly
- be consistent in the comparison of alternatives
- document the reasons for judgements



22

Test for significance 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?



23

Impact significance criteria

- environmental loss and deterioration
- social impacts resulting from environmental change
- non-conformity with environmental standards
- probability and acceptability of risk



24

Ecological significance criteria

- reduction in species diversity
- habitat depletion or fragmentation
- threatened, rare and endangered species
- impairment of ecological functions e.g.
 - disruption of food chains;
 - decline in species population;
 - alterations in predator-prey relationships.



25

Social significance criteria

- human health and safety
- decline in important resource
- loss of valued area
- displacement of people
- disruption of communities
- demands on services and infrastructure



26

Environmental standards:

- limits on waste / emissions discharge and concentrations
- clean air standards, water quality standards
- policy objectives and targets
- plans that allocate use of land and natural resources



27

Alternative approaches to determine significance:

- apply technical criteria when changes are predictable
- use negotiation when significance is disputable



28

Impacts are likely to be significant if they:

- are extensive over space or time
- are intensive in concentration or in relation to assimilative capacity
- exceed environmental standards or thresholds
- do not comply with environmental policies/ land use plans
- affect ecological sensitive areas and heritage resources
- affect community lifestyle, traditional land uses and values

Checklist for rural and urban water supply and sanitation projects

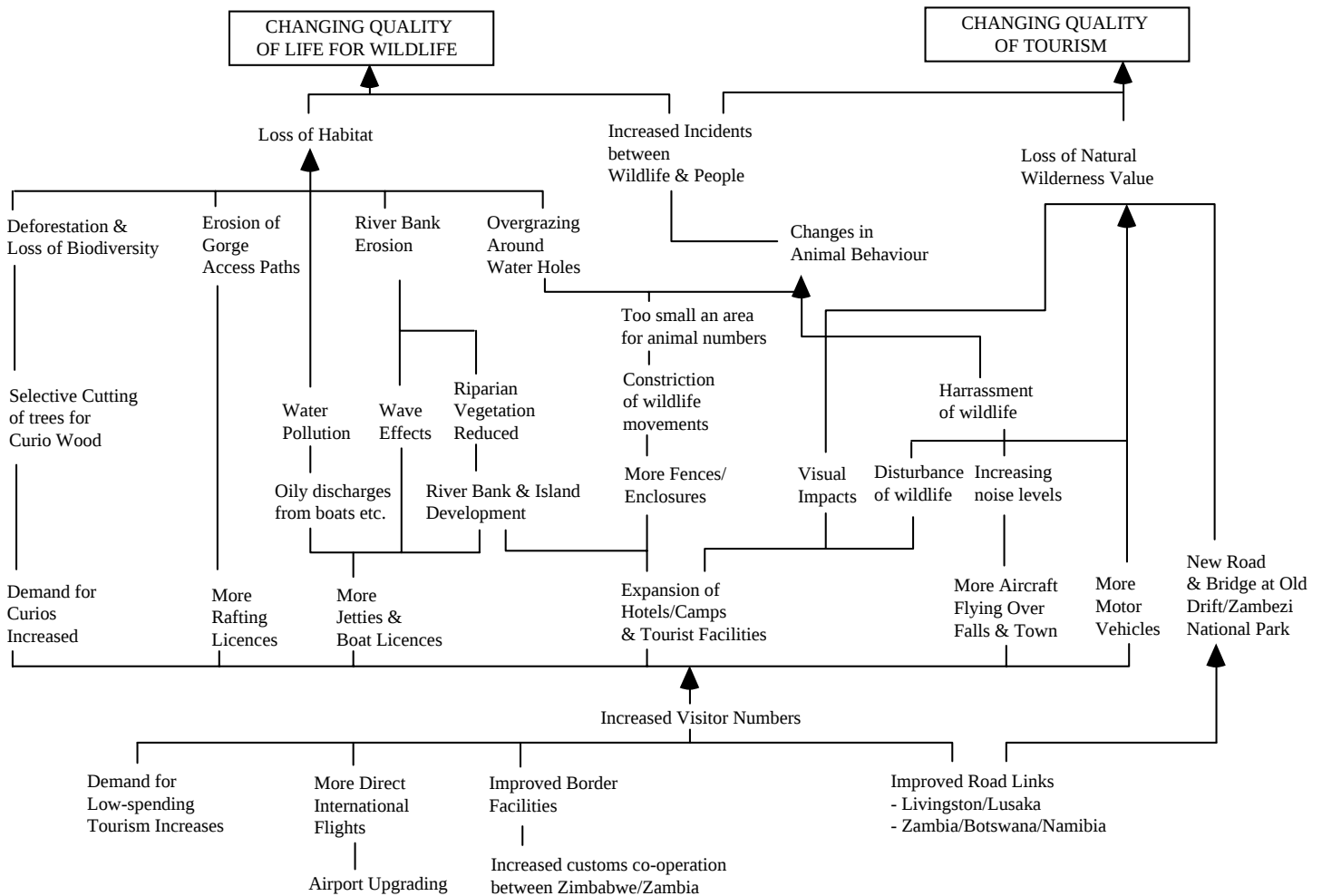
Aspects of EIA	Checklist Questions Will the project:	Yes	No	Additional Data needs
Sources of Impacts	1. Require the acquisition or conversion of significant areas of land for reservoir/treatment works etc. (e.g. > 50 ha rural, > 5 ha urban)?	☐	☐	☐
	2. Result in significant quantities of eroded material, effluent or solid wastes?	☐	☐	☐
	3. Require significant accommodation or service amenities to support the workforce during construction (eg > 100 manual workers)?	☐	☐	☐
Receptors of Impacts	4. Flood or otherwise affect areas which support conservation worthy terrestrial or aquatic ecosystems, flora or fauna (eg protected areas, wilderness areas, forest reserves, critical habitats, endangered species); or that contain sites of historical or cultural importance?	☐	☐	☐
	5. Flood or otherwise affect areas which will affect the livelihoods of local people (eg require population resettlement; affect local industry, agriculture, livestock or fish stocks; reduce the availability of natural resource goods and services)?	☐	☐	☐
	6. Involve siting sanitation treatment facilities close to human settlements (particularly where locations are susceptible to flooding)?	☐	☐	☐
	7. Affect sources of water extraction?	☐	☐	☐
Environmental Impacts	8. Cause a noticeable permanent or seasonal reduction in the volume of ground or surface water supply?	☐	☐	☐
	9. Present a significant pollution risk through liquid or solid wastes to humans, sources of water extraction, conservation worthy aquatic ecosystems and species, or commercial fish stocks?	☐	☐	☐
	10. Change the local hydrology of surface water-bodies (eg streams, rivers, lakes) such that conservation-worthy or commercially significant fish stocks are affected?	☐	☐	☐
	11. Increase the risk of diseases in areas of high population density (eg onchocerciasis, filariasis, malaria, hepatitis, gastrointestinal diseases)?	☐	☐	☐
	12. Induce secondary development, eg along access roads, or in the form of entrepreneurial services for construction and operational activities?	☐	☐	☐
Mitigation Measures	13. Be likely to require mitigation measures that may result in the project being financially or socially unacceptable?	☐	☐	☐
Comments				
I recommend that the programme be assigned to Category		☐		
Signature: Delegation.....Desk.....				

Source: Directorate-General for Development Commission of the European Communities, 1993

Example of an assessment matrix

BIOLOGICAL ENVIRONMENT	Forest		
	Shrubland		
	Grassland		
	Herbfield (alpine)		
	Sand/shingle/rock		
	Cropland		
	Urban land		
	Lakes		
	Rivers		
	Estuaries		
	Inter-tidal		
	Marine		
	Wetlands		
PHYSICAL ENVIRONMENT	River regime		
	Erosion/land stability		
	Sedimentation		
	Surface water		
	Ground water		
	Agricultural soil		
	Foundation materials		
	Climate/atmosphere		
	Nuisance (noise, dust, smell)		
	Landform		
SOCIAL ENVIRONMENT	Public participation		
	Employment		
	Settlement		
	Land value		
	Existing land uses		
	Risks and anxieties		
	Personal and social values		
	Historical/cultural		
	Landscape/visual		
	Recreation		
Environmental Effects Development		Treatment - Comminution - Sedimentation - Millscreening - Oxidation ponds - Activated sludge - Trickling filter - Nutrient removal - Chlorination - Further treatment offsite	Disposal - Land - Rapid infiltration - Surface flooding - Spray irrigation Disposal - Inland Water - River - Lake Disposal - Marine Water - Estuary - Inshore marine - Offshore marine Deep well injection

Network showing impact linkages leading to changes in quality of life, wildlife and tourism (arising from increased visitor numbers)



(Source: Bisset personal communication)

Impact characteristic summary table

IMPACT CHARACTERISTIC	IMPACT TYPE		
	air quality	health	etc
nature			
magnitude			
extent/location			
timing			
duration			
reversibility			
likelihood (risk)			
significance			

Topic 7

Mitigation and impact management

Introduction

Checklist

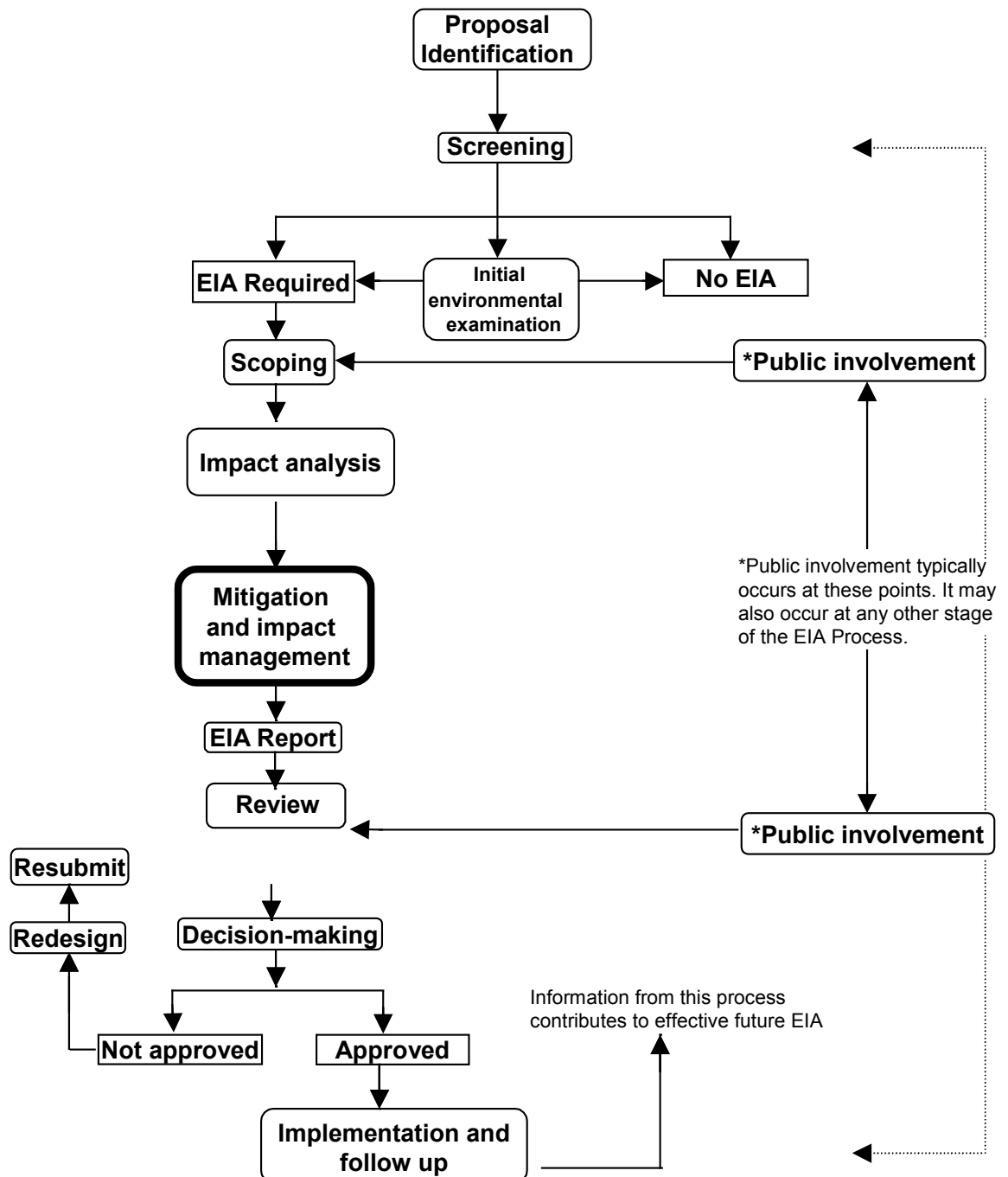
Session outline

Reference list and further reading

Training activities

Support materials

Mitigation and impact management



Topic 7—Mitigation and impact management

Objectives

To understand the role of mitigation in the EIA process and its importance for impact management.

To identify the principles, elements of approach and measures that are used for this purpose.

Relevance

Mitigation is the stage of the EIA process when measures are identified to avoid, minimise or remedy impacts. These measures are implemented as part of the process of impact management, together with any necessary adjustments to respond to unforeseen impacts. Both elements are integral to ensuring that the EIA process leads to practical action to offset the adverse environmental impacts of proposed developments.

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.

Topic 7
Mitigation
and impact
management



Information checklist

Obtain or develop the following, as appropriate:

- ☐ EIA reports (preferably local) and associated approval conditions that have been used to generate and implement impact management plans;
- ☐ examples of the successful design and implementation of measures as a result of EIA;
- ☐ copies or results of any research focused on mitigation or impact management, and if possible relevant information from monitoring, audit and other follow up measures;
- ☐ contact names and telephone numbers of people, agencies, organizations and environmental information data resource centres able to provide assistance in mitigation or impact management; and
- ☐ other resources that may be available, such as courses in specific analytical or methodological techniques, videos, journal articles, computer programmes, lists of speakers, and case studies.

Session outline

Welcome participants to the session. Outline the overall coverage of the session, its objectives and why these are important in the EIA process.

The purpose of mitigation is to identify measures that safeguard the environment and the community affected by the proposal. Mitigation is both a creative and practical phase of the EIA process. It seeks to find the best ways and means of avoiding, minimising and remedying impacts.

Mitigation measures must be translated into action in the correct way and at the right time if they are to be successful. This process is referred to as impact management and takes place during project implementation. A written plan should be prepared for this purpose, and includes a schedule of agreed actions.

Introduce the link between the EIA process and the mitigation of adverse impacts. Broadly discuss what mitigation seeks to achieve.

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, minimise 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 emphasised 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



1



2

Topic 7
**Mitigation
and impact
management**

- take any necessary action when unforeseen impacts occur.

Discuss the proponent's responsibility for implementing mitigation and the potential long-term benefits to the proponent of appropriate mitigation.

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 'internalise' 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.

The sustainability agenda is placing new demands on proponents with regard to mitigation and impact management. For example, increasing attention is being given to the principle of 'no net loss of natural and social capital'. Under the polluter pays principle, the application of this principle could require the proponent to make restitution for unavoidable residual damages. In this case, mitigation would include in-kind compensation measures, comprising equivalent, comparable or suitable offsets for all residual environmental impacts of a proposal.

Briefly discuss the main elements of mitigation and principles for their application. Consider how these might be used as part of EIA good practice locally.

In Figure 1 below, the elements of mitigation are organised into a hierarchy of actions:



3



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- first, avoid adverse impacts as far as possible by use of preventative measures;
- second, minimise 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 the following:

- give preference to avoid and prevent measures;
- consider feasible alternatives to the proposal and identify the best practicable environmental option;
- identify customised measures to minimise 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.

EIA good practice in mitigation requires a relevant technical understanding of the issues and the measures that work in the circumstances.

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-standardised 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.

Elaborate the framework by which mitigation measures can be systematically identified and summarise the different actions that are involved.

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A three-step process of mitigation can be applied to relate the hierarchy of elements in Figure 1 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 is to minimise and compensate for unavoidable impacts. However, these distinctions are not rigid and opportunities for creative mitigation should be sought at all stages of EIA and project planning.

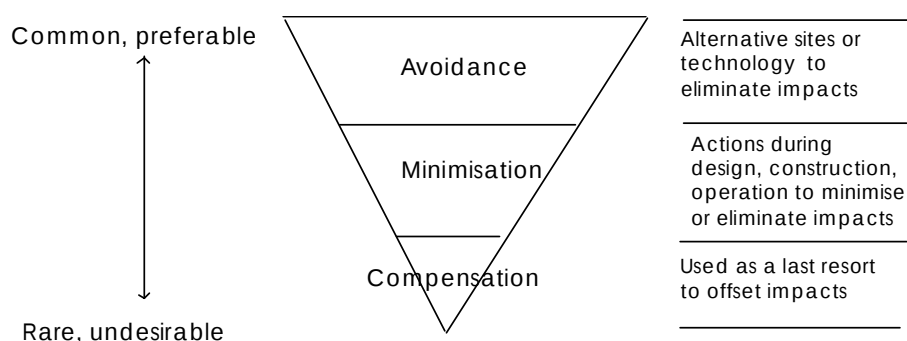


Figure 1: The elements of mitigation

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 minimisation. 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;



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- 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.

Describe the approaches that can be taken in EIA to mitigate impacts. Discuss these in detail, noting when and how they can be appropriate. Encourage the group to contribute to the discussion and provide local examples.

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:

- developing environmentally better alternatives to the proposal;
- making changes to project planning and design;
- carrying out impact monitoring and management; and
- compensating for impacts by
 - monetary payment
 - in kind measures
 - site remediation bonds
 - a resettlement plan.

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, when the process is still flexible (see Topic 5 -*Scoping*). 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.

Making changes to project planning and design

Early consideration of environmental factors and impacts in project planning and design facilitates impact avoidance and minimisation. 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.



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In practice, the elements of mitigation and the measures identified for a proposal will be tailored to the major impacts and the environment and community affected. A list of potential impacts for an extensive range of project types and suggested design measures to mitigate them can be found in *Volumes 2 and 3* of the *World Bank Environmental Assessment Sourcebook* and its various *Updates*. For example, almost all development proposals involve disturbance of the land surface. This is usually extensive for major linear projects (roads, pipelines), dams and reservoirs, and large-scale agriculture, forestry and housing schemes. Environmental impacts of particular concern can include drainage of wetlands, conversion of natural areas, or expansion into areas that are vulnerable to natural hazards.

The general considerations to be taken into account when mitigating the environmental impacts of housing schemes are described in Box 1. Specific measures that can be applied in planning and design of dams and reservoirs to avoid or reduce their impact are identified in Box 2. Looking ahead, the potential impacts of climate changes may have to be considered in mitigation planning and design, for example to address increased or reduced precipitation or inundation or saline influx into coastal areas as a result of a 1m rise in sea level.

Handout 7-1 provides further details of measures for mitigating the impacts of different types of projects. *Note that the references in the handout are to other tables within the Sourcebook.*



7-1

Box 1: Mitigation of large scale housing projects

Major adverse impacts	Mitigating measure
Displacement of existing land uses	Ensure that due consideration is given to the proper trade-offs between land values for housing and those of other uses, such as prime farmland, forests or natural habitats of value to society as a whole. Review existing planning and design standards to ensure that they are suited to local conditions and not unnecessarily wasteful of land. Make any necessary changes, for example by drafting new regulations
Destruction of environmentally critical areas	Ensure that regionally critical environmental sites, such as forested areas, major bodies and wetlands, habitats containing rare and endangered species, etc., are identified and not threatened by project location. Identify mitigation measures to avoid, reduce or compensate for environmental impacts and to enhance the environmental and community benefits of the proposal.

Source: adapted from the World Bank, 1991

Box 2: Case Example of mitigation of a dam project

The EIA for the Seco River Dam in Oaxaca Mexico identified a series of measures to avoid or minimise the impact of the proposed dam, including:

- replacing homes and lands of the people displaced
- operating and rehabilitating borrow pits in an appropriate manner
- establishing fish breeding programmes
- removing trees for wood from the site prior to flooding
- instituting environmental management regimes for the watershed, forestry, grazing etc.
- planting trees as barriers
- promoting agricultural practices that will reduce the need for water
- establishing technical advisory, financing and social service programmes

Sanchez-Silva and Cruz-Ulloa, (1994)

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 (described later in this topic). Further information on monitoring and implementation can be found in Topic 11 – *Implementation and follow up*.

In some cases, it may be necessary to establish or strengthen impact management systems to facilitate the implementation of mitigation measures during project construction and operation. These supporting actions should be identified as part of the environmental management plan. They can include the establishment of an environmental management system (EMS) based upon ISO 14000 guidelines for strengthening particular arrangements for impact management. Any other supporting actions to implement these measures, such as training and capacity building, should also be specified.

The management of social impacts associated with the influx of a temporary workforce and additional population will 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.

Compensating for impacts

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 are 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.

Site remediation bonds

Recently, attention has also focused on problems of contaminated land and the requirements for site remediation. 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.

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.

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. Further discussion of these issues can be found in Topic 15 – *Future directions*.

Discuss the positive contribution that EIA can make when an environmental management plan (EMP) is prepared to monitor and manage the impacts over the life of the project and to ensure that mitigation measures are implemented at the appropriate time during construction.

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.

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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 Box 3, which reflects practice at the World Bank. Although there is no standard format, 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;
- programme for surveillance, monitoring and auditing; and
- contingency plan when impacts are greater than expected.

Box 3: Components of an environmental management plan (EMP)

The following aspects should typically be addressed within an EMP:

Summary of impacts: The predicted adverse environmental and social impacts for which mitigation is required should be identified and briefly summarised. Cross-referencing to the EA report or other documentation is recommended.

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 programme: The monitoring program should clearly indicate the linkages between impacts identified in the EIA report, measurement indicators, detection limits (where appropriate), 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



7-2

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, and factored into loan negotiations.

Source: World Bank, 1999

The EMP should contain commitments that are binding on the proponent. It can be translated into project documentation and provide the basis for a legal contract that sets out the responsibilities of the proponent. In turn, the proponent can use the EMP to establish environmental performance standards and requirements for those carrying out the works or providing supplies. An EMP can also be used to prepare an environmental management system for the operational phase of the project.

Include a training activity to reinforce the topic (if desired).

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

Reference list

The following references have been quoted directly, adapted or used as a primary source for major parts of this topic.

OECD – Organisation for Economic Cooperation and Development (1992) *Economic Instruments for Environmental Management in Developing Countries*. OECD, Paris.

Sadar M and Associates (1995) *Environmental Impact Assessment*. Carleton University, Ottawa, Canada.

Sanchez-Silva R and Cruz-Ulloa S (1994) Environmental Impact of an Agricultural Project in La Roca, Oaxaca, Mexico. *Impact Assessment*. Vol 12 (1).

World Bank (1991) *Environmental Assessment Sourcebook* (three volumes). Technical Papers Nos. 139, 140 and 154, World Bank, Washington D.C.

World Bank (1995) *Environmental Assessment Challenges and Good Practice*. Environment Department Papers No. 18, World Bank, Washington D.C.

World Bank (1999) Environmental Management Plans. *Environmental Assessment Sourcebook Update*, Number 25, Environment Department, World Bank, Washington D. C.

Further reading

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

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

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

- 7-1 For a particular project type, get the group to identify the range of typical impacts that could be expected and the different ways in which these impacts could be mitigated.
- 7-2 Identify the types of situations when 'in-kind' compensation should be required of proponents. What can be done if an 'in-kind' solution appears to be impracticable?
- 7-3 As a group, develop a checklist method for producing an impact management plan from an EIA report and any associated approval conditions.
- 7-4 Discuss approaches that can be taken to encourage construction contractors to comply with the environmental policy of the proponent.
- 7-5 Discuss the difference in approach to the mitigation and management of impacts. What could be done in the event that an impact is greater than forecast and exceeds an environmental standard (e.g. for air or water discharge)?

Speaker themes

- 7-1 Invite a speaker who has experience in implementing the recommendations of EIA reports to outline the approaches that have, and have not, been successful.
- 7-2 Invite a speaker who has prepared an environmental management plan (or an equivalent document) to outline the process that was followed and to comment on how successful it has been in practice.
- 7-3 Invite, as a speaker, a proponent/project manager for an EIA to describe the process to establish measures to mitigate the adverse environmental impacts, giving particular attention to their early identification by the EIA and project design teams.

Group Activity 7–1: Mitigation and impact management

Title: Producing impact management plans

Aim: Practical grasp of identifying project recommendations, approval conditions and items that require monitoring and in turning them into specific, actionable tasks.

Group size: Four or five people

Duration: Half-day

Resources required:

- ☐ EIA reports and case study materials for each group.

Description of activity:

- ☐ As a group develop the main elements of an impact management plan for the case study project (see Handout 7–2: *Preparing an impact management plan*).
 - ☐ Each group then reports back to the whole group.
 - ☐ The group as a whole identifies commonalities and differences in the different plans.
-

Group Activity 7-2: Mitigation and impact management

Title: Impact mitigation

Aim: Understanding of quick identification of potential major impacts and possible mitigation measures.

Group size: Three or four people

Duration: One hour

Resources required:

- ☐ A set of approximately five project outlines and descriptions of environmental settings.

Description of activity:

- ☐ Spending approximately ten minutes on each project, identify the potential major impacts associated with each proposal and outline mitigation measures that might be appropriate in each case.
-



1

The purpose of mitigation is to:

- find better ways of doing things
- enhance environmental and social benefits
- avoid, minimise or remedy adverse impacts
- ensure that residual impacts are within acceptable levels.



2

The purpose of impact management is to:

- ensure mitigation measures are implemented
- establish systems and procedures for this purpose
- monitor the effectiveness of mitigation measures
- take action when unforeseen impacts occur.



3

Proponents have a responsibility to:

- avoid, minimise and remedy adverse impacts
- internalise the environmental and social costs of the proposal
- prepare plans for managing impacts
- repair or make restitution for environmental damages.



4

A framework for impact mitigation



5

Principles of mitigation

- give preference to avoid and prevent measures
- consider feasible alternatives to the proposal
- identify customised measures to minimise each major impact
- ensure they are appropriate and cost-effective
- use compensation as a last resort.



6

Impact avoidance can be achieved by:

- not undertaking certain projects or elements
- avoiding environmentally sensitive areas
- use of measures to prevent impacts from occurring
 - site remediation bonds
 - resettlement plans
 - in kind measures and offsets



7

Impact minimisation can be achieved by:

- scaling down or relocating the proposal
- redesigning elements of the project
- measures to manage the impacts.



8

Impact compensation can be achieved by:

- rehabilitation of resource or environmental components
- restoration of the site to its previous state
- replacement of the environmental values lost at another location.



9

Mitigation options

- develop alternatives that are better environmentally
- make changes in planning and design
- carry out impact monitoring and management
- compensate for residual impacts
 - monetary payment
 - site remediation bonds
 - resettlement plans
 - in kind measures and offsets



10

Environmental management plans should contain a:

- summary of impacts
- recommended mitigation measures
- statement of compliance with standards
- allocation of resources and responsibilities
- schedule of required actions
- surveillance, monitoring and auditing programmes
- contingency measures for greater than expected impacts

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Mitigation for large scale housing projects

Potential negative impacts	Mitigating measure
DIRECT IMPACTS	
1. Displacement of existing land uses	Ensure that due consideration is given to the proper trade-offs between land values for housing and those of other uses, such as prime farmland, forests or other land uses or natural habitats of value to society as a whole. Investigate existing planning and design standards to ensure that they are suited to local conditions and not unnecessarily wasteful of land. Assist in drafting new regulations that are more appropriate.
2. Destruction of environmentally critical areas	Ensure that regionally critical environmental sites, such as major forested areas, major water bodies and wetlands, habitats containing rare and endangered species, etc., are identified and not threatened by project location.
3. Danger to residents from hazardous natural conditions	Ensure that project site is not located in the following areas: • major floodplain • coastal zone inundation areas • areas of unstable soil or subsurface conditions • areas of highly saline soils • areas subject to landslides • seismically or volcanically active areas • excessively steep or wet areas • areas where significant risk from disease vectors exist or any other areas of significant natural hazard. Design accordingly if site cannot be moved.
4. Danger to residents from hazardous man-made conditions	Identify areas that have significant man-made hazards such as filled land, areas subject to subsidence from mining activity, groundwater, oil or other extractive process. Identify areas where solid or liquid or toxic wastes may be, or have been, dumped. Investigate site conditions with proper geo-technical or chemical testing procedures. Ensure that adequate funding and technical expertise are available to deal with the special conditions. Investigate alternate sites.
5. Hazard to residents from air, water or noise pollution from other adjacent or nearby land uses	Ensure that the site is located away from such pollution sources. Do not locate down-wind of significant point sources of air pollution such as smoke stacks. Identify noise sheds around airports, major roads, etc. Provide buffers of other compatible uses of adequate width between residential areas and sources of pollution. Take measures to abate pollution at source, if feasible; such as noise barriers along expressways are an example. Investigate alternate sites.
6. Hazard to residents from air pollution due to site location being in an area subject to frequent temperature inversions	Seek alternate site locations if pollution is from existing sources that are difficult to abate. Otherwise design project with low densities and non-polluting technologies for heating, cooking, etc.
7. Dislocation of existing resident populations	Ensure that any involuntary resettlement is done in accordance with proper standards or consider alternate sites.
8. Destruction of historic or cultural resources	Consider alternate sites or make provision to set aside and zone historic and culturally significant areas.
9. Overloading of existing infrastructure and services	Coordinate with other planning goals and objectives for region. Upgrade existing infrastructure and services, if feasible. Consider alternate sites.
10. Excessive depletion of resources such as lumber or fuel or overtaxing of traditional industries, such as brickmaking	Review capacity of local resources and industries to provide for large-scale construction and upgrade if feasible. Select materials and design criteria according to local conditions and availability of resources. Design for maximum efficiency in material and energy use. Encourage the study of indigenous customs and techniques for building and incorporate in project design.
LOCAL AND SITE SCALE IMPACTS	

Mitigation for large scale housing projects (continued)

11. Damage to sites and their immediate surroundings resulting from the disruption of the natural environment, in particular the soil, vegetation and drainage network (see below for more detailed comments).	Identify the basic natural systems of a site and its immediate surroundings and protect with set-asides for open space, easements and buffer areas etc. Adapt layouts to fit natural patterns rather than imposing rigid geometries.
12. Degradation of habitats caused by fragmentation	Maintain and/or design open space networks to follow natural site features, such as stream corridors, and connect the site and local and regional open space systems.
13. More extreme flood/drought cycles, increased erosion and siltation and degradation of stream biota and riparian vegetation etc caused by increased runoff from developed sites	Preserve existing vegetation, particularly intact natural habitats. Institute a stormwater management plan including strategies such as: • minimising impervious area • increasing infiltration to soil by use of recharge areas • use of natural vegetated swales instead of pipes or • installing detention or retention facilities with graduated outlet control structures. Use 'soft engineering' techniques for soil and bank stabilization such as vegetative stabilization (soil bio-engineering), in preference to built structures.
14. Depletion and/or pollution of local groundwater resources	Ensure that projected use of groundwater is within the capacity of natural system to replenish itself. Avoid 'mining' groundwater particularly in drier climates. Use indigenous vegetation that requires less water, drip irrigation or shaded plantings. Ensure that soils are suitable for septic tank or other on-site treatment. Design stormwater management systems as suggested above, in particular use vegetation to retain recharge and purify stormwater.
15. Degradation of soil cover from erosion, removal, or loss of soil structure due to compaction	Have both temporary (during construction) and permanent erosion control plans. Temporary control plans should include: • silt fencing • temporary silt trap basins • short term seeding or mulching of exposed soil areas (particularly on slopes) • limitations on access for heavy machinery and the storage of materials to avoid soil compaction. Permanent erosion control plans should focus on the establishment of stable native vegetation communities. Ensure that topsoil in construction areas is stripped and stored for future use and not illegally removed from site.
16. Loss or degradation of vegetation from unnecessary removal or mechanical damage	Identify important stands of vegetation, large contiguous stands of forest or other habitat, vegetation on steep slopes, and stream corridors or swales. Incorporate these areas into design layout or open space system. Protect such areas during construction by temporary fencing and limitations on access for heavy machinery and materials storage.
17. Degradation of habitat from inappropriate management or introduction of invasive exotic species	Protect natural habitat from destructive management or maintenance practices, such as the removal of understorey vegetation from woodlands, or excessive clearance of vegetation from stream banks. Do not use invasive exotic species for landscaping or reforestation.

From: Environmental Assessment Sourcebook (World Bank, 1991)

Mitigation for roads and highways

Potential negative impacts	Mitigating measure
DIRECT IMPACTS	
1. Increased sediment in streams affected by erosion at construction sites and fresh road cuts, fills and waste dumps.	Protect susceptible surfaces with mulch or fabric, and plant non-erodible surfaces as soon as possible.
2. Soil and water contamination by oil, grease, fuel and paint in equipment yards and asphalt plants.	Collect and recycle lubricants. Avoid accidental spills through good practice.
3. Air pollution from asphalt plants.	Install and operate air pollution control equipment.
4. Local dust and noise.	Periodically water down or lightly oil temporary roads. Install and maintain mufflers on equipment.
5. Air and noise pollution from vehicle operation, in populated areas traversed by the highway, notably metropolitan areas or densely settled rural areas.	Include physical barriers to noise in plans. Require adherence to engine maintenance schedules and standards (or use alternative fuels) to reduce air pollution. Enhance public transportation and traffic management capability.
6. Landscape disfiguration by embankments and deep cuts, fills and quarries.	Use an architectural design to 'blend' with the landscape. Replant disfigured surfaces.
7. Landslides, slumps, slips and other mass movements in road cuts.	Provide drainage works as needed to reduce risk, according to prior surveys. Align route to avoid inherently unstable areas. Stabilize road cuts with structures (concrete walls, dry wall masonry, gabions, etc).
8. Erosion of lands below the road bed receiving concentrated outflow from covered or open drains.	Increase number of drain outlets. Place drain outlets so as to avoid cascade effect, Line receiving surface with stones, concrete.
9. Roadside litter.	Provide for disposal facilities. Encourage anti-littering laws and regulations.
10. Hazardous driving conditions where construction interferes with pre-existing roads.	Provide in design for proper markers on roads, including lights.
11. Alteration of overland drainage and subsoil drainage (where road cuts intercept perched water tables, springs etc).	Installation of adequate drainage works.
12. Destruction of vegetation and wildlife in the right-of-way occupied by the highway.	Realignment where possible to detour exceptional areas, identified by prior surveys.
13. Destruction or damage of terrestrial wildlife habitats, biological resources or ecosystems that should be preserved.	Plan national transportation route alignment to avoid location of fragile, unique, etc areas.
14. Alteration of hydrological regimes of wetlands by causeways, with harmful effects on these ecosystems.	Realignment to avoid wetlands. Installation of culverts, bridges, etc as needed and according to criteria from prior hydrological surveys.
15. Interruption of migratory routes for wildlife and livestock. Increased collisions with animals.	Realign to avoid important migratory routes. Provide undergrade crossings.
16. Poor sanitation and solid waste disposal in construction camps and work sites.	Provide adequately located and maintained latrines.
17. Possible transmission of communicable diseases from workers to local populations and vice-versa.	Periodic health examinations of workers with treatment when needed.
18. Creation of temporary breeding habitats for mosquito vectors of disease, e.g. sunny, stagnant pools of water.	Assess vector ecology in work areas and take steps where possible to avoid creating habitats.
19. Creation of transmission corridor for diseases, pests, weeds and other undesirable organisms.	Set up plant and animal sanitation service and related checkpoints.
20. Poaching by construction workers.	Prohibit poaching under terms of employment.

Mitigation for roads and highways (continued)

21.	Dislocation and compulsory resettlement of people living on the right-of-way. (Near cities and in rich farming regions, many people can be affected.)	Locally unprecedented mechanisms and procedures may be required to arrive at equitable and adequate compensation, and a companion effort to develop the capacity may be required.
22.	Obstruction of routes from homes to farms, etc., increasing travel time.	Provide appropriately designed and located crossings.
23.	Impairment of non-motored transportation in the highway corridor due to reduced or impeded rights-of-way.	Design and implement safety measures and an emergency plan to contain damages from accidental spills. Designate special routes for hazardous materials transport.
INDIRECT		
25.	Induced development: roadside commercial, industrial, residential and 'urban sprawl'.	Involve land-use planning agencies at all levels in project design and EA and plan for controlled development.
26.	Increased motorized transportation (with possible increased dependency on imported fuels).	Include project components to encourage use of non-motorized transportation.
27.	Impairment of non-motorized transportation economy due to changes in land use and/or increased availability of motorized alternatives.	Include project components to stimulate local production and use of non-motorized modes of transportation.

From: Environmental Assessment Sourcebook (World Bank, 1991)

Note: Further information and examples of mitigating measures for other types of projects can be located in the Sourcebook.

Preparing an impact management plan

1. Note or establish an environmental policy for the proposal

- An environmental policy for a proposal should contain a concise statement of the commitment to certain standards of environmental performance and behaviour. It could for instance state that 'maximum use will be made of locally grown plantation timbers' or that 'all contractors will be required to produce their own environmental management plans and quality reports as the initial part of their contracts.'
- Think of ways to raise stakeholder awareness and commitment to the policy (employees, contractors, suppliers, client, community) and to ensure that they understand what is trying to be achieved and why

2. Designate a person to take overall responsibility for the impact management plan

A person or a group should be specifically allocated responsibility for the development, implementation and performance review of the impact management plan.

3. Identify tasks

- Examine the EIA and the conditions for approval to identify all commitments and obligations made regarding the environment.
- Identify any other environmental / impact management requirements arising from regulations, policies, guidelines, etc.
- Identify requirements for staff training.
- Identify a range of implementation tools that can be used to ensure that impact management is undertaken e.g. setting objective conditions for contracts, tenders, permits and licenses, establishing performance bonds to ensure environmental outcomes are achieved, etc.

4. Establish a plan and allocate responsibility

- Draw up a time based schedule of the identified tasks and allocate responsibility for each of them (see sample outline).
- Develop contingency plans that highlights actions to be taken and assigns obligations in the event of the detection of unacceptable adverse impacts.
- Check that those undertaking the detailed design of the project incorporate all commitments and obligations.
- Budget for the plan.

Impact Management Plan-sample task schedule

No.	Task Description	Responsible person/unit	Start Date	Finish Date	2002				2003				2004			

5. Develop a management system for monitoring, reporting and response

- Identify monitoring requirements and responsibilities.
- Establish a system of reporting at intervals that are appropriate to the various tasks (daily, weekly, monthly).
- Establish a system for data storage, retrieval and access.
- Establish a system for investigating and responding to complaints and enquires from outside parties.

6. Implement management system**7. Review performance**

- Establish a system of meetings to review issues arising out of the reporting and to focus on preventative and remedial measures.
- Conduct independent audits (compliance and surveillance) regularly.
- Update/review the impact management plan regularly.

Topic 8

Reporting

Introduction

Checklist

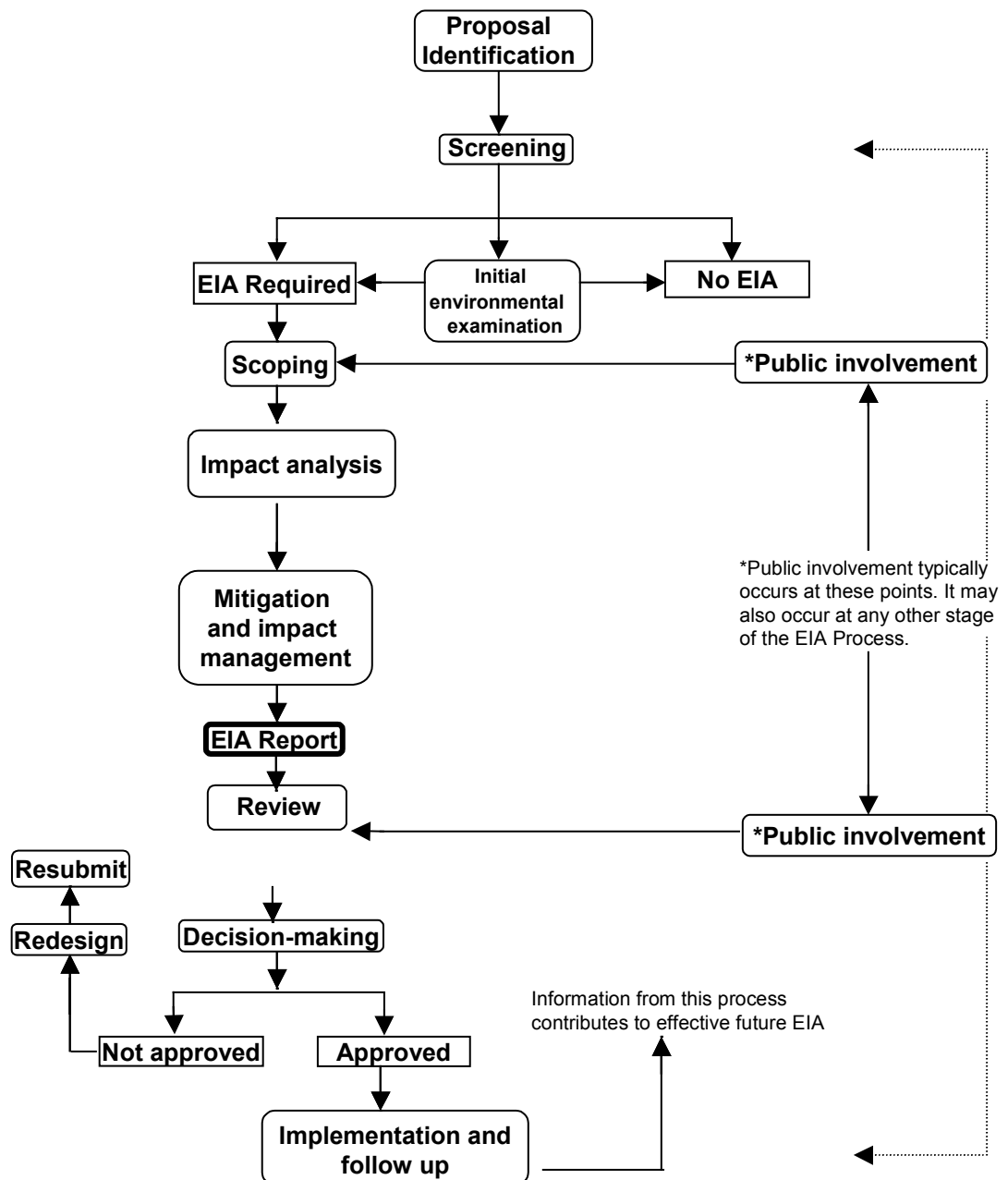
Session outline

Reference list and further reading

Training activities

Support materials

Reporting in the EIA process



Topic 8—EIA reporting

Objectives

To understand the purpose of preparing and submitting an EIA report.

To consider the relationship of the report to decision-making and how the information contained in an EIA report can be made more effective for this purpose.

Relevance

The EIA report or impact statement is a keystone document. It assembles the information that assists:

- the proponent in managing the impacts of the proposal;
- the responsible authority in decision-making and condition setting; and
- the public in understanding the likely impacts of the proposal.

Timing

Two hours (not including training activity). However this assumes that participants have already read the sample EIA reports which should have been handed out at registration.

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.

Topic 8
EIA
reporting



Information checklist

Obtain or develop the following materials, as appropriate:

- ☐ copies of locally produced EIA reports;
- ☐ copies of EIA reports from other jurisdictions covering types of proposals that would be of interest to the course participants;
- ☐ any local guidelines or requirements for EIA reports;
- ☐ procedures for the review of EIA reports (see Topic 9 – *Review of EIA quality*)
- ☐ contact names and telephone numbers of people, agencies, organisations and environmental information/data resource centres able to provide assistance in reporting; and
- ☐ other resources that may be available, such as courses in specific analytical or methodological techniques, videos, journal articles, computer programs, lists of speakers, and case studies.

Session outline

Welcome participants to the session by introducing yourself and getting them to introduce themselves. Check that they have received copies of sample EIA reports at registration and have read these. Outline the overall coverage of the session, its objectives and why these are important in the EIA process.

The EIA report or impact statement is a primary document for decision-making. It organises the information obtained and synthesises the results of the studies and consultations undertaken. A full yet concise account should be given of the likely environmental impacts of a proposal, the recommended measures for mitigating and managing them and the significance of any residual effects.

The audience for an EIA report includes the authorising and implementing agencies, other interested parties and the affected public. Because of its importance as a communications tool, the EIA report needs to be well organised and clearly written. An effective report will be written both in plain language for non-experts but also to appropriate technical standards.

Introduce the session by exploring with participants the various terms that may be used to describe an EIA report, and indicate local practice in this regard. Discuss who has responsibility for report preparation.



1

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 Topic 5 - *Scoping*). The terms of reference set out the information that is to be submitted to the decision-making body or responsible authority.

Introduce the purpose of the EIA report and the features that will make it successful.

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reporting



2

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 authorisation; and
- the public to understand the proposal and its likely impacts on people and the environment.



3

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 organises and presents the information necessary for project authorisation 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.

Introduce the typical elements of an EIA report, indicating those that are common to many countries even though the particular requirements may differ.

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's 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.



4

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

- executive or non-technical summary (which may be used as a public communication document);
- statement of the need for, and objectives of, the proposal;
- reference to applicable legislative, regulatory and policy frameworks;
- description of the proposal and how it will be implemented (construction, operation and decommissioning);
- comparison of the proposal and the alternatives to it (including the no action alternative);

- description of the project setting, including the relationship to other proposals, current land-uses and relevant policies and plans for the area;
- description of baseline conditions and trends (biophysical, socio-economic etc), identifying any changes anticipated prior to project implementation;
- review of the public consultation process, the views and concerns expressed by stakeholders and the way these have been taken into account;
- consideration of the main impacts (positive and adverse) that are identified as likely to result from the proposal, their predicted characteristics (e.g. magnitude, occurrence, timing, etc.) proposed mitigation measures, the residual effects and any uncertainties and limitations of data and analysis;
- evaluation of the significance of the residual impacts, preferably for each alternative, with an identification of the best practicable environmental option;
- an environmental management plan that identifies how proposed mitigation and monitoring measures will be translated into specific actions as part of impact management*; and
- appendices containing supporting technical information, description of methods used to collect and analyse data, list of references, etc.

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

Describe the elements of an EIA report in detail. Where possible, show examples of good practice for each one.

Executive or non-technical summary



5

The executive summary gives a concise description of the main findings and recommendations. It is not meant to summarise 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.



6

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;

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EIA
reporting

- major impacts and their significance;
- proposed mitigation measures;
- the environmental management plan; and
- any other critical matters that bear on the decision.

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.

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 summarised, explaining the reasons for any variation with them. A copy of the complete Terms of Reference should be appended.

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.

The above information is given in only enough detail for impact prediction and mitigation measures to be understood and appreciated. Wherever appropriate, maps, flow diagrams and other visual aids are used to summarise information.



7

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.



8

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.



9

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;



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- consideration of their compliance with environmental standards and policy objectives;
- recommended measures for avoiding, minimising 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.

The section can also indicate how environmental data was gathered, the predictive methods used and the criteria used to judge significance. 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 Topic 6 – *Impact analysis*. Both direct and indirect impacts, including potential cumulative effects, should be highlighted.

Impact characteristic summary table (prepare for each alternative)

Alternative No.	IMPACT TYPE		
IMPACT CHARACTERISTIC	air quality	health	etc.
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.



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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.

When used, formal methods of analysing alternatives should be briefly described and their assumptions and limitations noted.

Environmental management plan (EMP) – also called an impact management plan)

This section is the ‘action oriented’ part of the EIA report. It summarises recommended mitigation measures (and any opportunities for environmental enhancement) and describes how they will be implemented. An EMP is primarily about the actions that will be taken to monitor and manage the impacts during project implementation and operation. The plan should contain:

- recommended mitigation measures;
- assignment of responsibilities for plan implementation;
- schedule of the actions to be taken;
- programmes for surveillance and monitoring against agreed targets;
- an impact management strategy to correct larger than predicted changes;
- contingency and emergency response plans, where necessary; and
- reporting, audit and review procedures.

The EMP plan can also contain any institutional strengthening, capacity building and training requirements that are necessary to implement the components of the plans.

Appendices

Appendices contain the information that may be needed for reference or for detailed review by technical experts. Baseline data, technical information and description of methodologies can be included in appendices when they are important to an understanding of the basis of the EIA report but are not suitable for the main text. The technical appendices should be keyed to the organisation of the EIA report. In addition, appendices may contain some or all of the following:

- glossary and explanation of acronyms;
- listings of individuals and agencies consulted during the EIA;
- sources of data and information and a list of all reference material used;



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- EIA study team members and other contributors to the report; and
- terms of reference for the EIA.

Describe some of the common shortcomings encountered in the preparation of EIA reports. Ask the participants to contribute examples from their own experience.

An EIA report should be complete, easily understood, objective, factual and internally consistent. These objectives are difficult to achieve in a process that involves many contributors working to tight deadlines. Even so, far too many EIA reports fall short of meeting their basic purpose of providing the necessary and relevant information for decision-making and clearly communicating key findings to the public and other interested parties.

Higher standards could be achieved by addressing some of the shortcomings and deficiencies that are commonly found in EIA reports. The following list was compiled primarily from the experience of the Netherlands EIA Commission, which is an independent body responsible for the review of EIA reports.

The need for a project cannot be justified

Example: An EIA report substantiates the need for offshore exploratory drilling in a remote and sensitive Arctic Sound primarily in terms of energy security and economic development. The broader opportunity costs of opening the area to development are overlooked.

The objective and alternatives are too narrowly stated

Example: An EIA report on a proposed by-pass road identifies the objective as relieving traffic congestion, failing to consider broader transport issues and alternatives.

The description of the proposal does not cover the key features

Example: An EIA report describes the proposed construction of an industrial plant but omits information about construction of a pipeline and other facilities to transport and handle raw materials and finished products to and from the plant.

Selection of alternatives does not take into account environmental aspects

Example: The EIA report on a car racing circuit in a coastal dune landscape only considers alternatives meeting motor sport requirements, visitor 'needs' and public safety regulations. It overlooks environmental considerations, such as noise abatement, protection of land surface and dune ecology.

Key problems affected by the proposal are not described

Example: An EIA report describes the proposed construction of a coal-fired power plant using surface water as cooling medium. It does not divulge that



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the surface water body is already used by other industrial activities for this purpose to the limit of its cooling capacity.

Sensitive elements in the affected environment are overlooked

Example: An EIA report for a pipeline project does not indicate that the proposed alignment will dissect certain areas of ecological value.

Environmental target values and standards are not properly taken into account

Example: An EIA report for an extension of an airport describes the impacts up to the standard of 25 per cent of people seriously affected by aircraft noise, whereas the target value aims at 10 per cent of people seriously affected.

Alternatives do not comply with environmental regulations and standards

Example: An EIA report for a sanitary landfill indicates that the soil types in the area are very diverse, ranging from sand and clay to peat. The alternatives do not take into account the large differences in compaction and subsidence of these soil types, with subsequent failure of underlining and drainage systems.

Appropriate mitigating measures are not considered

Example: An EIA report for a sanitary landfill does not describe a system for collecting methane gas produced in the landfill, even though greenhouse gas emissions contribute to climate warming and should be capped at current levels.

The alternative offering the best protection to the environment is not described or insufficiently described

Example: An EIA report for a bridge or seabed tunnel across an estuary does not examine the alternative of a drilled tunnel underneath the estuary, which will have a much lower adverse impact on the environment.

Serious environmental impacts or risks are not described or are incorrectly described

Example: An EIA report for a sanitary landfill in an area with very variable soil conditions does not describe the environmental risks and consequences of a possible failure of the underlying sealing and drainage systems.

Insufficient or outdated prediction models are used

Example: An EIA report on an urban development scheme makes use of a mobility prediction model using national averages, although local data is available and would permit a more precise prediction to be made.

When comparing alternatives, incorrect conclusions are drawn

Example: An EIA report for a regional management plan for the disposal of municipal sewage sludge compares various alternative methods for



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disposal. One alternative involves composting the sludge into a low-grade soil additive. The comparison of the alternatives in the EIA report describes this method as an important form of disposal because it greatly reduces sludge volume. However, no account is taken of the limited potential for use of the product due to the high heavy metal content of the sludge.

Outline some general guidelines that will help to ensure that the effective preparation and production of the report. Ask the participants to add to these guidelines based on their own experience.

Usually, EIA reports are the product of a team of consultants and specialists. Most proposals have a number of different types of potential impacts (biophysical, socio-economic, health, etc) and their analysis requires a range of expertise. An EIA Project Manager or team leader has responsibility for forming an interdisciplinary team and managing its work (see Topic 12 – *EIA project management*).

The EIA report is a statement of the likely impacts of a proposal and how these can be mitigated and managed. It is a decision document, not a compendium of technical information. As such, the EIA report should be both rigorous and easily understood. It must effectively communicate the findings to the public at large, local people affected by the proposal and interest groups, as well as decision-makers who are the primary users.

As described earlier, the executive summary is particularly important as the only section of the EIA report that will be widely read. The *precis* of significant findings presents the reporting team with the opportunity to describe complex material in a few pages. It is easy to call for, but hard to do. Tables, diagrams and caption materials that capture and compare significance impacts can help. All have their place but none can be effective without the preliminary work of producing a clear and comprehensive EIA report, which is based on rigorous studies, sound data and consistent analysis and interpretation.

Distribution of the report

Usually, EIA reports are available to the public and distributed widely. However, the institutional arrangements for this purpose differ. As a general guide, the EIA report should be accessible to all those who have an interest in, or are affected by, the proposal. Where public consultation has been extensive, it can be useful to lodge the EIA report in public institutions and distribute the summary to all individuals who have registered their names. Other measures may be needed in many developing countries, particularly where proposals directly affect poor and non-literate communities.

Other forms of presentation

Depending upon the circumstances, other forms of presentation of the findings should be considered. These include:

- use of local media, radio and television;
- community report back;
- newsletters, information sheets;
- walk-in and storefront displays; and
- feedback through political representatives, local chiefs or other power structures, as appropriate.

Make brief reference to the fact that a report for a Strategic Environmental Assessment (SEA) could follow similar lines for certain types of plans and programmes, but with greater variation for policies. Also note that in SEA greater emphasis is placed on identifying generic alternatives (see Topic 14 – *Strategic Environmental Assessment*).

Include a training activity to reinforce the topic (if desired).

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

Reference list

The following references have been quoted directly, adapted or used as a primary source for major parts of this topic.

World Bank (1991) *Environmental Assessment Sourcebook*. Volume 1. World Bank Technical Paper No. 139, World Bank, Washington D.C.

Boyle, J and Mubvami, T. (1995) *Training Manual for Environmental Impact Assessment in Zimbabwe*. Department of Natural Resources Ministry of Environment and Tourism, Zimbabwe

Scholten J (1997) Reviewing EISs/EIA Reports. In *Report of the EIA Process Strengthening Workshop* (pp. 61-90). Environment Protection Agency, Canberra.

Further reading

OECD/DAC (1994) *Towards Coherence in Environmental Assessment: Results of the Project on Coherence of Environmental Assessment for International Bilateral Aid*. 3 Vols. Canadian International Development Agency, Ottawa.

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

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

- 8-1 How are EIA reports best structured to make them useful to their target audience? What specific changes to EIA reports are required locally?
 - 8-2 What are the main shortcomings of EIA report writing? How can the style of presentation be improved to correct common deficiencies that have been identified internationally and locally?
 - 8-3 What can be done to improve the quality and readability of EIA reports?
-

Speaker themes

- 8-1 Invite a speaker who is experienced in preparing or, preferably, reviewing the quality of EIA reports to discuss the strengths and weaknesses of a range of existing reports.
-

Group Activity 8–1: EIA reporting

- Title:** Writing executive summaries
- Aim:** To gain an appreciation of how to write concise and relevant summaries of EIA reports.
- Group size:** Individual exercise
- Duration:** Half-day. (Reasonably short EIA reports should be handed out well before the activity commences, preferably at registration, so that there is time for them to be read by participants.)

Resources required:

- ❑ An EIA report for each participant, preferably with the executive summary removed and available for inspection later.
- ❑ A handout describing the key elements of an executive summary that would be appropriate for the local process.

Description of activity

- ❑ The participants should have already read the EIA report. They are to produce an executive summary that is not to exceed four pages (about 1500 words).
 - ❑ Participants can compare their summary with the one written for the report and analyse which summary better meets the needs of the decision-makers, the public and the proponent.
-

Group Activity 8–2: EIA reporting

Title: Preparing an environmental management plan from an EIA report

Aim: To gain an appreciation of how to assess the adequacy of the report as a basis for impact monitoring and management of a proposal.

Group size: Pairs

Duration: Half-day. (The EIA reports should be handed out well before the activity commences, preferably at registration, so that there is time for them to be read by participants.)

Resources required:

- ☐ An EIA report for each pair of participants.

Description of activity:

- ☐ The participants are to review the EIA report to determine the range of activities and impacts that require management and monitoring.
- ☐ From this they can attempt to prepare an environmental management plan noting any inadequacies in the EIA report.
- ☐ Conclude with reporting back by groups to the group as a whole and a discussion summarising the activity.



1

Different names for the same document

- Environmental Impact Assessment report (EIA report)
- Environmental Impact Statement (EIS)
- Environmental Statement (ES)
- Environmental Assessment report (EA report)
- Environmental Effects Statement (EES)

(Describe local usage: enter local terminology)



2

The EIA report is a statement that assists:

- the proponent to plan and design;
- the responsible authority to decide; and
- the public to understand



3

A successful EIA report will be:

- actionable – by the proponent
- decision-relevant – to the responsible authority
- user-friendly – for the public



4

Main elements of an EIA report

- executive summary
- need for and aims of the proposal
- description of proposal and alternatives
- description of affected environment and community
- public consultation and views
- main impacts and their mitigation
- evaluation of significant residual impacts
- environmental management plan



5

Preparing an executive summary

- target to audience
- keep it short
- make it clear and consistent
- avoid jargon
- summarise key findings



6

An executive summary should outline:

- the proposal and its setting;
- terms of reference of the EIA
- results of public consultation
- alternatives considered
- major impacts and their significance
- mitigation and management measures
- any other critical matters



7

EIA Report – description of the proposal includes:

- main elements, phases and alternatives
- requirements for materials, water, energy, equipment
- operational processes and products
- summary of technical, economic and environmental features
- comparison of options (e.g. size, location, etc.)



8

EIA Report – description of the affected environment includes:

- spatial and temporal boundaries
- baseline conditions – biophysical, land use, socio-economic
- key trends and anticipated conditions
- relationship to other policies, plans and proposals



9

EIA Report – results of public consultation includes:

- identification of interested and affected stakeholders
- method(s) used to inform and involve them
- analysis of views and concerns expressed
- how these were taken into account
- issues remaining to be resolved



10

EIA Report - evaluating impacts for each alternative

- prediction of each major impact
- proposed mitigation measures
- significance of the residual impact
- limitations, uncertainty and gaps in knowledge
- some mitigating measures not considered



11

EIA Report – comparative evaluation of alternatives:

- adverse and beneficial impacts
- effectiveness of mitigation measure
- distribution of benefits and costs
- opportunities for enhancement
- reasons for preferred alternative



12

Environmental management plans contain:

- proposed mitigation measures
- schedule for implementation
- surveillance and monitoring programmes
- impact management strategy
- reporting, audit and review procedure
- any institution and capacity building requirements



13

Some common shortcomings of EIA reports

- objective of proposal described too narrowly
- description does not cover complete activity
- alternatives do not account for the environment
- key problems not described
- sensitive elements in environment overlooked
- relevant standards and legislation not described



14

Some common shortcomings of EIA reports (continued)

- best alternative not described (or insufficiently described)
- serious impacts not mentioned or not correctly described
- outdated or ineffective prediction models used
- impacts not compared with standards or targets
- appropriate mitigation measures not considered
- incorrect conclusions drawn

Topic 9

Review of EIA quality

Introduction

Checklist

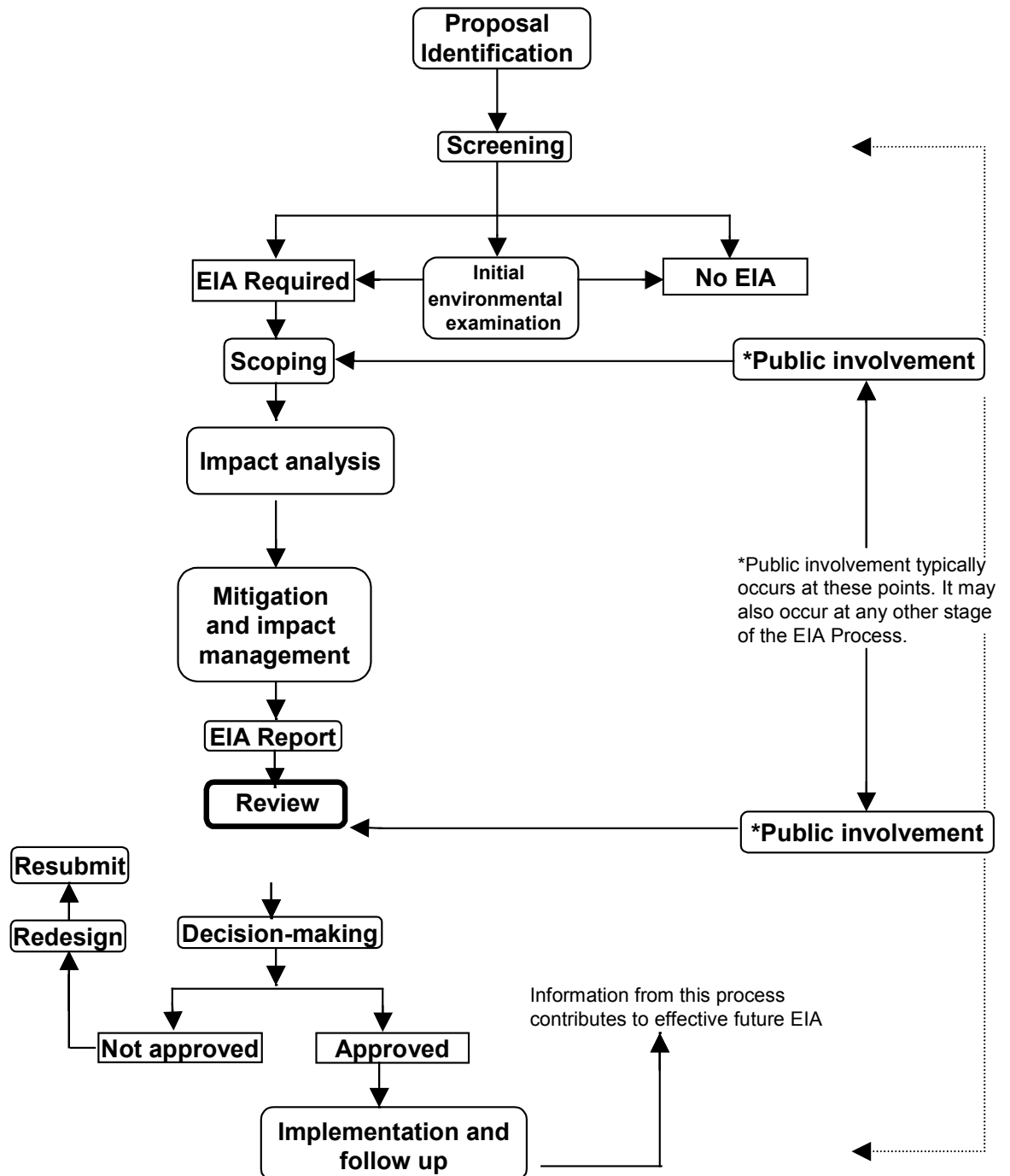
Session outline

Reference list and further reading

Training activities

Support materials

Reviewing in the EIA process



Topic 9—Review of EIA quality

Objectives

To understand the role and contribution of review of the quality of the EIA report.

To gain familiarity with the procedure and methods which are used for this purpose.

Relevance

The review of the quality of an EIA report is one of the main 'checks and balances' built into the EIA process. It helps to ensure the information submitted is credible and sufficient for decision-making purposes. Often, the quality of EIA reports can be significantly improved by review, resulting in more informed approvals and better environmental outcomes.

Timing

Three 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.



Information checklist

Obtain or develop the following materials, as appropriate:

- ☐ list of agencies/government departments etc. responsible for review in the local EIA system;
- ☐ review procedure and requirements established in the EIA legislation or guidelines;
- ☐ methods and criteria that are used or could be applied locally to review the quality of EIA reports;
- ☐ examples of reviews of EIA reports carried out locally and their results;
- ☐ outline of a typical public review process and how it is related to decision-making;
- ☐ copies of public submissions or inputs to the review of EIA reports;
- ☐ examples of the system of summarizing and reporting on public submissions on the EIA report;
- ☐ copies of any research focused on the quality of EIA reports;
- ☐ contact names and telephone numbers of people, agencies, organizations and environmental information/data resource centres able to provide assistance in relation to reviewing; and
- ☐ other resources that may be available such as videos, journal articles, list of speakers, and case studies.

Session outline

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 they are important.



1

The review of the quality of an EIA report is a formal step in the EIA process. It is taken to ensure that the information provided by the report complies with the terms of reference and is sufficient for decision-making purposes. The review stage typically provides the main opportunity for public comment on the statement of significant impacts and their mitigation.

A systematic, open process of review assures decision-makers that the statement of impacts is credible and imparts public confidence in the EIA process. This section describes the objectives, elements and steps that can be applied to promote good practice in the review of EIA reports. Reference is also made to the review procedures operated by different countries.

Introduce the role and purpose of the review process in EIA.



2

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 authorisation. 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.

In many EIA systems, the review stage is the major opportunity for public involvement. However, the arrangements for this purpose vary considerably from country to country. They range from notification of a period for receiving written comments on the EIA report to holding public hearings. Typically, the latter mechanism is part of an independent review by an EIA panel or inquiry body, which is considered to be a particularly transparent and rigorous approach.

An interim or prior review of EIA preparation can provide an informal check on the quality of work, to verify that is satisfactory and meets requirements. Normally, this will be carried out by the responsible authority. However, the proponent can undertake an internal or 'mock' review of EIA quality as part of due diligence or quality assurance. In this way, proponents can ensure their work is of an appropriate standard before it is subject to external review. This can help to avoid delays associated with the issuance of deficiency statements or requests for additional information.

Briefly outline why it is important to develop a systematic approach to EIA review and discuss the elements and aspects that need to be considered. Ask the group if they can identify others.

A pre-decision review of the EIA report is a key means of 'quality control and assurance' in the EIA process. It allows an external check on the proponent's 'self-assessment' of the proposal. This is a formal procedure in many EIA systems, which may be undertaken by the responsible authority itself, another government agency or committee or an independent body. Despite significant differences, their common function is to check that the draft EIA report complies with applicable requirements and/or is consistent with accepted standards of good practice.

Whatever procedure is followed, a rigorous approach is necessary, given that the central role of EIA review is to assure the quality of the information prepared. This approach can be based on explicit guidelines and criteria for review, or if these are not available, draw on EIA principles, objectives and terms of references. Over time, their systematic application should improve the general standard of EIA reports by making proponents aware of government or agency expectations.

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?



3

- 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.

Describe the different procedures that can be used to conduct a review of the quality of an EIA report. Consider the process that is applied locally and ask participants to discuss what improvements could be made.

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.

An issue common to all EIA review procedures is how to ensure objectivity. The responsible authority is widely perceived as having a vested interest in the outcome of review, particularly when it is also the proponent. Checks and balances are introduced by guidance and review criteria, and the involvement of the public and outside experts. More 'arms length', impartial procedures include the use of inter-agency committees or independent panels or tribunals, which are acknowledged as a 'reference standard of good practice' for EIA review.

Specific procedures for EIA review that are in place in different countries are shown in Box 1. 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 characterised 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 characterised by:

- higher levels of quality assurance;
- independence from the responsible authority (to varying degrees);



4

- 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.



5

Box 1: Selected examples of EIA review procedures

- review by environmental agency (Australia)
- review by independent panel or mediator (Canada, only for major proposals)
- review by standing commission of independent experts (Netherlands)
- review by standing commission of experts within the government (Italy, Poland)
- review by inter-agency committee (USA)
- review by planning authority using government guidelines (UK, New Zealand)

Source: Scholten (1997)

Discuss the different approaches that can be used to seek the views of the public during the review phase of the EIA process. Consider how these might be applied locally.

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. More proactive forms of public and stakeholder involvement are preferable, especially when there are significant impacts on a local community or people will be displaced by a proposal. (Further information on public involvement can be found in Topic 3 – *Public involvement*).

A set period for public review and a formal notification procedure are common. The notification usually indicates where the EIA report is displayed and how comments are to be received. Typically, public comments are solicited in writing. However, this approach may exclude many people, including those who are directly affected by the proposal.

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.



6

Describe the steps involved in reviewing an EIA report. Discuss how these steps correlate with the process used locally.

The following steps can help to achieve good practice in the review of EIA reports:

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



7

Identifying the review criteria

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

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 (see Topic 5 – *Scoping*).

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.

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.

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 listed in Box 1 may require consideration.

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.

(Further information on methods for EIA review is given in the next section. A set of criteria to review the quality of EIA reports and the overall process are provided in the resource materials at the end of this topic.)

Box 2: Aspects for consideration in a comprehensive EIA review

- 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
- modes of public and stakeholder involvement



8

Carrying out the 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.

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 realise that the decision-making will be delayed by some time until a new report or supplement to the EIA report is completed.

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.

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 (see Topic 10 – *Decision-making*).

Outline the different review methods that can be used and discuss any methods that have been used locally. Ask what experience the group members have had of these, or other, review methods.



9

A range of methods can be used to review the adequacy of an EIA report. The methods are generally the same as those used in impact analysis and include:

General checklists

These can be adapted to review purposes, using compliance with local EIA legislation or guidelines as the starting point. A range of criteria drawn from the discussion in the section above can then be incorporated. Sectoral checklists represent a further stage of development to review the technical adequacy of EIA reports in terms of their coverage of specific types of

impacts, mitigation measures and monitoring requirements (see review checklist at Handout 9–1).

Project specific checklists and guidelines

These can be based on a general or sectoral checklist, with further adaptations to suit the requirements of the specific project and its terms of reference.



10

EIA review frameworks and packages

A number of these are available. The review package developed by the EIA Centre, University of Manchester is widely referenced and used by non-specialists. It comprises a seven-part rating scale, directions on its use and a collation sheet for recording findings on EIA components, such as baseline information, impact prediction and consideration of alternatives. Other review packages are available and can be adapted for use in cases where guidance and criteria have yet to be established.

Expert and accredited reviewers

One or more experts can be used to peer review the adequacy of the report. The expert(s) contracted should be independent from those involved in preparing the EIA report or undertaking studies. In some countries, EIA experts are accredited or registered as capable of carrying out a study or review.

Public hearings

Public hearings on an EIA report give the highest level of quality assurance. They provide affected and interested parties with an opportunity to comment extensively on the information and findings. These benefits are maximised when public hearings are held by an independent EIA panel, commission or other inquiry body. A structured and systematic process can be followed to test the quality of the report and to integrate technical evidence and public comment.

Comprehensive review of the EIA process

Effectiveness frameworks can be used when a comprehensive review of the EIA process leading to report preparation is considered necessary (see Annex). For example, this approach may be called for if there are very serious deficiencies with a report and each step needs to be revisited. Also, effectiveness review can help our understanding of how different EIA components and activities affect the quality of EIA reports and indicate ways review procedure and criteria themselves may be strengthened. In this regard, effectiveness review can cover the overall performance of the EIA process. Further information on this subject can be found in Topic 11–*Implementation and follow up*.



9-1

Introduce and explain the basis of the *Procedures for evaluating EIA Reports* (Handout 9-1).

Handout 9-1 provides checklists and a flow chart of the steps which may be applied to review the quality of an EIA report. It provides a simple tabular approach to grading the performance of the report in accordance with the criteria. The materials also call for a brief report to be written at the end of the review process. However, it is important to conduct the review as a practical exercise, centered on the requirements that apply and the decision to be made.

Many exercises using EIA frameworks and review packages are conducted as academic exercises, unrelated to the context and circumstances. A common temptation is to be too negative and to grade EIA reports on what ideally should have been done, rather than what was asked for or required. The terms of reference provide the benchmark for critical review. Where they are not available, the review can follow the steps described earlier, including rapid re-scoping and identifying points of reference from comparable EIAs. In addition, reviewers should consider the constraints under which an EIA has been undertaken.

For example, an EIA report might not include baseline information because the data was not available and process deadlines gave insufficient time for the necessary field surveys to be undertaken. Although not good practice, these realities are part of EIA practice in all countries. They can be particularly limiting in many developing countries, where environmental monitoring and information systems are non-existent or poorly developed.

Include a training activity to reinforce the topic (if desired).

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

Annex 1: Effectiveness framework for review of the process leading to the preparation of the EIA report.

This framework for EIA review comprises a list of questions to check that the EIA process was satisfactorily completed (e.g. in accordance with legal requirements and terms of reference in force) and then consider the quality of the EIA report.

The following rating scale may be used to answer the following questions in detail.

- A. excellent (thoroughly and competently performed)
- B. good (minor omissions and deficiencies)
- C. satisfactory (some omissions and deficiencies)
- D. poor (significant omissions and deficiencies)
- E. very poor (fundamental flaws and weaknesses)
- F. no opinion (insufficient basis/experience on which to judge)

I. EIA process

Were the following activities completed fully and successfully?

- a) screening — proposal classified correctly as to level and requirement for assessment?
- b) scoping — process completed and resulted in:
 - i) priority issues and relevant impacts identified?
 - ii) key actors involved?
 - iii) reasonable alternatives established?
 - iv) terms of reference/study guidelines prepared?
- c) impact analysis — process completed in scope and depth necessary?
 - i) affected environment (baseline) conditions described?
 - ii) estimation and prediction of main impact categories?, including
 - indirect and cumulative effects?
 - other relevant factors?
 - iii) suitable database and methodologies used?
- d) mitigation — necessary measures or environmental management plan identified?, including
 - i) follow up and monitoring arrangements if strategies are untried or impacts uncertain?

- ii) specification of contingency plans or non-standardised operating responses?
- e) significance — residual effects evaluated as to potential severity?, including reference to
 - i) their scope, duration and irreversibility?
 - ii) relative importance to dependent communities or ecological functions?
 - iii) possible compensation or offset mechanisms (also 2d)?

II. Quality of EIS/EIA report

Is the information included consistent with the terms of reference and the process followed? Specifically is the information:

- i) complete — informed decision can be made?
- ii) suitable — right type of information included?
- iii) understandable — easily apprehended by decision maker?
- iv) reliable — meets established professional and disciplinary standards?
- v) defensible — risks and impact are qualified as to proposal uncertainties?
- vi) actionable — provides clear basis for choice and condition setting?

Source: Sadler (1996)

Reference list

The following references have been quoted directly, adapted or used as a primary source for major parts of this topic.

Boyle J and Mubvami T (1995) *Training Manual for Environmental Impact Assessment in Zimbabwe*. Department of Natural Resources, Ministry of Environment and Tourism, Zimbabwe.

Fuller K (1999) Quality and Quality Control in EIA in Petts J (ed) *Handbook of Environmental Impact Assessment*. Volume 2 (pp.55-82). Blackwell Science Ltd Oxford, UK.

Lee N and Colley R (1992) *Reviewing the Quality of Environmental Statements*. Occasional Paper Number 24, EIA Centre, University of Manchester

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

Scholten J (1997) Reviewing EISs/EA reports in *Report of the EIA Process Strengthening Workshop* (pp. 61-90) Environment Protection Agency, Canberra.

Further reading

Commission of the European Communities (CEC) Directorate General for Environment, Nuclear Safety and Civil Protection (1993) *Review Checklist*. (CEC) Brussels.

EIA Centre, University of Manchester (1995) *Leaflet 11: Reviewing Environmental Impact Statements*. EIA Centre, University of Manchester, UK.

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

- 9-1 Who has local responsibility for reviewing an EIA report? What other groups or individuals could review the document and what would be achieved if they did?
 - 9-2 As a group, develop a set of criteria to review an EIA report.
 - 9-3 What role do the terms of reference play in the review process?
What are the alternatives if terms of reference are not available?
-

Speaker themes

- 9-1 Invite a speaker who has experience in reviewing locally produced EIA reports to outline the review process used and discuss some common failings. Focus some of the group discussion on ways in which both the review process and the quality of EIA reports can be improved.
 - 9-2 Invite a speaker to outline how review processes are managed when an EIA report is produced in compliance with the requirements of international or multiple agencies.
-

Group Activity 9–1: Review of EIA quality

Title: Reviewing an EIA report

Aim: To develop familiarity with the process and issues of reviewing an EIA report.

Group size: Three or four people

Duration: Whole day (depending upon the review procedures used.)

Resources required:

- ☐ An EIA report for each group.
- ☐ Copies of local review procedures or those provided with the manual.

Description of activity:

Each group is to apply the review procedures to evaluate the EIA report they have been given:

- ☐ the review should be accompanied by a brief (three page) summary of the findings;
- ☐ each group should then prepare a 10 minute briefing for the 'Minister for the Environment' on their findings; and
- ☐ present these briefings to the whole group for discussion.

Group Activity 9–2: Review of EIA quality

Title: **Reviewing against the Terms of Reference**

Aim: To understand how the review of EIA reports depends on adequate Terms of Reference, as the basis of review criteria.

Group size: Three or four people

Duration: Whole day (may be less if the background information is not very detailed)

Resources required:

- ☐ A detailed case study including Terms of Reference (ToR) and EIA report for each group.
- ☐ Copies of local review criteria, or those provided with this topic.

Description of activity:

- ☐ Use the criteria provided to assess whether the EIA report was satisfactory against the ToR.
 - ☐ Discuss whether any weaknesses in the ToR or review process are apparent as a result of the review.
 - ☐ Discuss any further information that could be required before the final decision is taken.
 - ☐ Outline any conditions that should be placed on any approval to proceed.
 - ☐ As a whole group review the findings of the activity.
-



1

Flowchart of the EIA process



2

Purpose and objectives of review

The purpose of the review process is to establish if the information in an EIA report is sufficient for decision-making.

Key objectives are to:

- review the quality of the EIA report
- take account of public comment
- determine if the information is sufficient
- identify any deficiencies to be corrected.



3

EIA review – aspects for consideration

- compliance with terms of reference
- information is correct and technically sound
- account taken of public comments
- complete and satisfactory statement of key findings
- information is clear and understandable
- information is sufficient for decision-making



4

EIA review — types of procedure

Internal review:

- low operating costs
- can lack rigour and transparency
- often no documentation of results.

External review:

- independent, expert check on EIA quality
 - more rigorous and transparent
 - report on sufficiency or deficiency
 - publish the review report
-



5

EIA review procedures

- environmental agency
- independent panel (or mediator)
- standing commission
- inter-agency committee
- planning authority



6

EIA review – steps to good practice

- set the scale of the review
- select reviewer(s)
- use public input
- identify review criteria
- carry out the review
- determine remedial options
- publish the review report



7

EIA review criteria

The following can be used (in order of priority):

- Terms of Reference
- EIA reports of comparable proposals
- other guidance including:
 - EIA requirements, guidelines and criteria
 - principles of EIA good practice
 - knowledge of the project and typical impacts



8

Carrying out the EIA review

A four-step approach can be followed:

- Step 1: identify the deficiencies
- Step 2: focus on critical shortcomings
- Step 3: recommend remedial measures
- Step 4: advise on implications for decision-making

(The last step does not apply in all systems)



9

EIA review methods

- general checklists
- project specific checklists
- review packages
- expert and accredited reviewers
- public hearings
- effectiveness review frameworks



10

A rating scale for EIA review

Rating	Explanation
A	generally well performed, no important tasks left incomplete
B	generally satisfactory and complete, only minor omissions and inadequacies
C	just satisfactory despite omissions and/or inadequacies
D	parts well attempted but must, on the whole be considered just unsatisfactory because of omissions and/or inadequacies
E	unsatisfactory, significant omissions or inadequacies
F	very unsatisfactory, important task(s) poorly done or not attempted
N/A	not applicable, the review topic is not applicable in the context of the project

Procedures for Reviewing EIA Reports

These procedures are based on the work of

Lee, N. and Colley, R. (1990) *Reviewing the Quality of Environmental Statements*.
Occasional Paper Number 24. EIA Centre. University of Manchester

and

Boyle, J. and Mubvami, T. (1995) *Training Manual for Environmental Impact Assessment in Zimbabwe*. Department of Natural Resources Ministry of Environment and Tourism,
Zimbabwe

Procedures for Reviewing EIA Reports

Instructions for Reviewing EIA Reports

Background

The following tables provide one approach to reviewing the basic adequacy of the standard of an EIA report. **These tables are not sufficient on their own to fully review a report.** It is recommended that the following steps should also be carried out:

- a check for compliance with legal or donor requirements;
- an assessment of the scientific and technical adequacy of the work; and
- a public review of the work.

This review should be able to be carried out by a person who is familiar with the environmental impact assessment process and the requirements of any local regulations.

Instructions

The review process is outlined on the flowchart on the following page.

There are four review areas, each with a series of review categories.

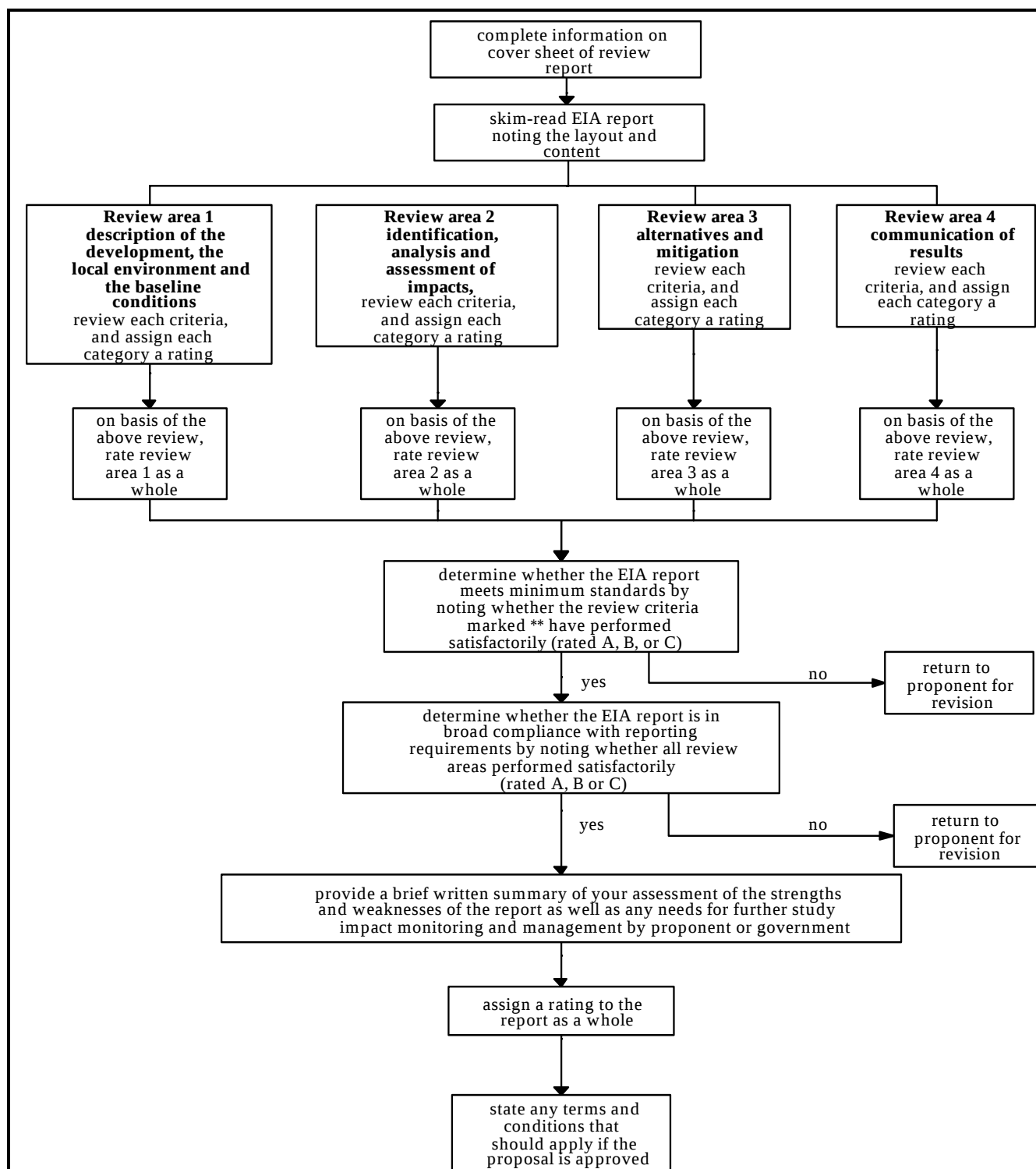
For each review category, the reviewer is asked to rate the EIA report for its performance in addressing a list of issues. The reviewer gives each issue a rating between A and F (see table of review criteria for details). The overall rating for a category is then determined by the reviewer on the basis of the results of the individual ratings, weighted according to their relative importance by the reviewer.

Some issues and categories (marked **) are essential to the overall adequacy of the EIA report. If they do not achieve a minimum rating of C the report should be returned to the proponent for improvement, or, if this is not feasible, other remedial action should be taken as appropriate.

The evaluation of the overall report is determined by the reviewer, based on the ratings of the review categories, again weighted according to their relative importance. Added to this evaluation should be:

- a brief summary of the strengths and weaknesses of the report;
- any needs for further study;
- any impact monitoring and management required to be undertaken by the proponent or the government; and
- any terms and conditions that should apply if approval of the proposal is granted.

Procedures for Reviewing EIA Reports



Procedures for Reviewing EIA Reports

Review of EIA Report**EIA report title and date:**

EIA report reviewed by:

Dates of review:

Review criteria:

Rating	Explanation
A	generally well performed, no important tasks left incomplete
B	generally satisfactory and complete, only minor omissions and inadequacies
C	just satisfactory despite omissions and/or inadequacies
D	parts well attempted but must, on the whole be considered just unsatisfactory because of omissions and/or inadequacies
E	unsatisfactory, significant omissions or inadequacies
F	very unsatisfactory, important task(s) poorly done or not attempted
N/A	not applicable, the review topic is not applicable in the context of the project

Procedures for Reviewing EIA Reports

Review of EIA Report

Using the review criteria from the previous page, complete the tables on the following pages and then answer the following questions.

1 Minimum requirements

Did **all** the review criteria marked ** in the EIA review tables perform satisfactorily, i.e. rate A, B or C?

YES NO

(If not the report should be returned to the proponent for revision.)

2 Broad compliance

Were **all** four review areas rated satisfactory or better ,i.e. rate A, B, or C?

YES NO

(If not the report should be returned to the proponent for revision.)

3 Overall quality

Overall rating for report	A	B	C	D	E	F
---------------------------	---	---	---	---	---	---

Provide a brief summary of the key factors which determined your overall rating. Include your assessment of the strengths and weaknesses of the report as well as any needs for further study and impact monitoring and management by the proponent or the Government. Pay particular attention to the adequacy of the report based on the requirements of your discipline or agency.

4 Approval terms and conditions

If EIA acceptance of the proposal is granted on the basis of this EIA report what terms and conditions should govern the manner in which the activity proceeds? These can refer to responsibilities of either the Government or the proponent.

Procedures for Reviewing EIA Reports

Review Area 1

Description of the development, the local environment and the baseline conditions

1.1	Description of the development: the purpose(s) of the development is adequately described as well as its physical characteristics, scale and design. Quantities of material needed during construction and operation are included and, where appropriate, a description is given of the production processes.	
1.1.1	The purposes and objectives of the development are adequately explained.	rating**
1.1.2	The design, size or scale of the development, and the nature and duration of construction and operation activities, are adequately described. Diagrams, plans, charts and/or maps are used effectively for this purpose	rating**
1.1.3	The report adequately describes the environmental planning that went into the design of the project to minimise negative environmental effects and capture potential benefits.	rating**
1.1.4	Important design features, especially those for environmental planning and socio-economic management (eg pollution control, waste management, erosion control, handling of toxic or hazardous materials, worker services) are highlighted.	rating
1.1.5	There is an adequate indication of the physical presence or appearance of the completed development within the receiving environment.	rating
1.1.6	The nature and quantities of material need during both the construction and operational phases are described as well as, where appropriate, the nature of the production processes.	rating
1.1.7	The numbers of workers involved with the project during both construction and operation are estimated.	rating**
Overall grade for category 1.1 A B C D E F <i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
Comments		
1.2	Site description: the on-site land requirements of the development are described, as well as the duration of each land use.	
1.2.1	The land area taken up by the development site is well defined and its location clearly shown on a map.	rating**
1.2.2	The uses to which this land will be put are described and the different land use areas demarcated.	rating
1.2.3	Where alternate plans, designs or sites are being considered each is adequately discussed according to Criteria 1.2.1 and 1.2.2	rating
Overall grade for category 1.2 A B C D E F <i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
Comments		

Procedures for Reviewing EIA Reports

1.3	Residuals: the types and quantities of residual and/or waste matter and energy created are adequately estimated, the expected rate of production given, and the proposed disposal routes to the environment identified.								
1.3.1	The types and quantities of waste matter, energy and residual materials and the rate at which these will be produced, are adequately estimated. Uncertainties are acknowledged and ranges or confidence limits given where possible.				rating**				
1.3.2	The ways in which it is proposed to handle and/or treat these wastes and residuals is indicated, together with the routes by which they will eventually be disposed of to the environment.				rating**				
Overall grade for category 1.3 A B C D E F <i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>									
Comments									
1.4	Bounding the study: appropriate boundaries to the study area and time horizon are identified.								
1.4.1	The environment expected to be affected by the development is delimited with the aid of suitable scale map(s).				rating**				
1.4.2	The affected environment is defined broadly enough to include any potentially significant effects occurring away from the immediate project site(s). These may be caused by, for example, the dispersion of pollutants, off-site infrastructure requirements, traffic, etc.				rating**				
1.4.3	The time horizon of the study is long enough to account for delayed effects.				rating				
Overall grade for category 1.4 A B C D E F <i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>									
Comments									
1.5	Baseline condition: an adequate description of the affected environment as it is currently, and as it could be expected to develop if the project were not to proceed, is presented.								
1.5.1	The important components of the affected environments are adequately identified and described. The methods and investigation undertaken for this purpose are disclosed and are appropriate to the size and complexity of the assessment task. An appropriate amount of fieldwork was done. Uncertainties are indicated.				rating**				
1.5.2	Existing data sources were searched and, where relevant, used. These include local authority records and studies carried out by, or on behalf of, government and private sector organisations.				rating				
1.5.3	Local land use and development plans were consulted and other data collected as necessary to assist in the determination of the probable future state of the environment, in the absence of the project, taking into account natural fluctuations and human activities.				rating				
Overall grade for category 1.5 A B C D E F <i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>									
Comments									
Overall evaluation of Review Area 1 A B C D E F									
Comments									

Procedures for Reviewing EIA Reports

Review Area 2

Identification, Analysis and Assessment of Impacts

2.1	Identification of impacts: all potentially significant impacts are identified. Key impact are also identified and the main investigation centred on these.	
2.1.1	All important issues identified in the EIA terms of reference are included in the report. Deviations and exclusions are adequately accounted for.	rating* *
2.1.2	Direct and indirect impacts are identified using a systematic methodology (e.g. project-specific checklists, matrices, impact networks, expert judgement, extensive consultations). A brief description of the impact identification methods is given along with the rationale for using them.	rating* *
2.1.3	Due attention is paid to environmentally sensitive areas, to off-site, time delayed or recurring (e.g. seasonal) impacts and to cumulative or synergistic effects with existing and anticipated developments.	rating
2.1.4	Consideration is not limited to effects which will occur under design operating conditions. Where appropriate, impacts which might arise from non-standard operating conditions, or due to accidents, are also included.	rating
2.1.5	All phases of the project are considered e.g. pre-construction, construction, operation and decommissioning.	rating* *
2.1.6	Key impacts were identified and selected for more intense investigation. The scoping methods are described and their use justified.	rating* *
Overall grade for category 2.1 A B C D E F <i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
Comments		
2.2	Analysis of impact severity: the likely impacts of the development on the environment are analysed and described in as precise terms as possible.	
2.2.1	Impacts are analysed as the deviation from baseline conditions, i.e. the difference between environmental conditions expected if the development were not to proceed and those expected as a consequence of it.	rating* *
2.2.2	The data used to estimate the severity of impacts is sufficient for the task and clearly described. Any gaps in the required data are indicated and accounted for.	rating* *
2.2.3	The methods used to predict impact severity are described and are appropriate to the size and importance of the projected disturbance. The assumptions and limitations of the methods are explicitly discussed.	rating* *
2.2.4	Descriptions of impact severity encompass the appropriate characteristics of impact (e.g. magnitude, areal extent, duration, frequency, reversibility, likelihood of occurrence).	rating
2.2.5	Where possible, estimates of impacts are recorded in measurable quantities with ranges and/or confidence limits as appropriate. Qualitative descriptions, where necessary, are as fully defined as possible (e.g. 'minor' means not perceptible from more than 100m distance).	rating
Overall grade for category 2.2 A B C D E F <i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
Comments		

Procedures for Reviewing EIA Reports

2.3	Assessment of impact significance: the expected significance that the projected impacts will have for society are adequately assessed. The sources of quality standards plus the rationale, assumptions and value judgements used in assessing significance are fully described.					
2.3.1	The significance of all impacts which will remain after mitigation are described and clearly distinguished from impact severity.					rating*
2.3.2	The significance of impacts is assessed using appropriate national and international quality standards where available. Explicit account is taken of the values placed on affected environmental features locally, nationally and (where appropriate) internationally.					rating
2.3.3	The choice of standards, assumptions and value systems used to assess significance are justified and the existence of opposing or contrary opinions acknowledged.					rating
2.3.4	Wherever possible, economic values are attributed to environmental costs and benefits.					rating
2.3.5	Individuals, groups, communities and government agencies affected by the project are clearly identified.					rating*
Overall grade for category 2.3						A B C D E F
(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)						
Comments						
Overall evaluation of Review Area 2						A B C D E F
Comments						

Procedures for Reviewing EIA Reports

Review Area 3

Alternatives and Mitigation

3.1	Alternatives: project alternatives are considered. These are outlined, the environmental implications of each presented and the reasons for their adoption or rejection briefly discussed.	
3.1.1	Alternative sites, processes, designs and operating conditions are considered where these are practicable and available to the developer. The main environmental advantages and disadvantages of these are discussed and the reasons for the final choice given.	rating* *
3.1.2	Where possible, alternative construction strategies (e.g. timing, local versus imported labour) are considered and assessed for their environmental and socio-economic implications.	rating
3.1.3	For public sector proposals, alternative means of achieving project goals are considered (e.g. energy efficiency investments versus dams for energy supply). If not, the report discusses why this was not done.	rating
Overall grade for category 3.1 A B C D E F (Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)		
Comments		
3.2	Scope and effectiveness of mitigation measures: all significant adverse impacts are considered for mitigation. Evidence is presented to show that proposed impact management measures will be appropriate and effective.	
3.2.1	Concerned stakeholders (e.g individuals, groups, communities, government agencies) have been adequately consulted and their views accounted for in the development of mitigation measures.	rating* *
3.2.2	The mitigation of all significant adverse impacts is considered. Wherever possible, specific mitigation measures are defined in practical terms (e.g. costs, manpower, equipment and technology needs, timing).	rating* *
3.2.3	Any residual or unmitigated impact are discussed and justification offered as to why these impacts should not or cannot be mitigated.	rating
3.2.4	It is clear to what extent the mitigation methods will be effective. Where effectiveness is uncertain or depends on assumptions about operating procedures, climatic conditions, etc data is introduced to justify the acceptance of these assumptions.	rating
3.2.5	An effective environmental monitoring and management plan is presented to deal with expected; possible but uncertain; and unforeseen impacts caused by the project. Training needs are identified. The costs of the programme are estimated. Developer and government responsibilities are distinguished, reporting and review procedures are specified.	rating* *
Overall grade for category 3.2 A B C D E F (Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)		
Comments		
3.3	Commitment to mitigation: the project proponent clearly expresses a commitment to, and capability of, carrying out the mitigation measures.	
Overall grade for category 3.3 A B C D E F (Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)		
Comments		
Overall evaluation of Review Area 3 A B C D E F		

Procedures for Reviewing EIA Reports

Comments

Review Area 4

Communication

4.1	Public involvement: there were genuine and adequate consultations with concerned project stakeholders to inform them of the project and its implications and to obtain their views on key issues to be investigated and managed. The scope and results of the public involvement program are adequately documented in the report.					
Overall grade for category 4.1		A B C D E F				
(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)						
Comments						
4.2	Layout: the layout of the report enables the reader to find and assimilate information easily and quickly. External data sources are acknowledged.					
4.2.1	There is an introduction briefly describing the project, the aims of the environmental assessment and how those aims are to be achieved.					rating
4.2.2	Information is logically arranged in sections or chapters and the whereabouts of important data is indicated in a table of contents or index. Terms of reference and data used in the assessment are included in appendices. The study team members are identified.					rating*
4.2.3	When data, conclusions or quality standards from external source are introduced, the original source is acknowledged at that point in the text. A full reference is included in a footnote or in a list of references.					rating
Overall grade for category 4.2		A B C D E F				
(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)						
Comments						
4.3	Presentation: care is taken in the presentation of information to make sure that it is accessible to the non-specialist.					
4.3.1	Information is comprehensible to the non-specialist. Tables, graphs and other graphics are used as appropriate. Unnecessarily technical or obscure language is avoided. Technical terms, acronyms and initials are defined, either when first introduced in the text or in a glossary.					rating*
4.3.2	The report is presented as an integrated whole. Data presented in appendices is fully discussed in the main body of the text.					rating
Overall grade for category 4.3		A B C D E F				
(note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)						
Comments						

Procedures for Reviewing EIA Reports

4.4	Emphasis: information is presented without bias and receives the emphasis appropriate to its importance in the context of the project.	
4.4.1	Prominence and emphasis is given to all potentially significant impacts, both adverse and beneficial, in a balanced manner.	rating*
4.2.2	The statement is unbiased and does not lobby for any particular point of view.	rating
Overall grade for category 4.4 A B C D E F <i>(note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
Comments		
4.5	Non-technical summary: there is an adequate non-technical summary outlining the main conclusions and how they were reached.	
4.5.1	There is an adequate non-technical summary of the analysis and main findings of the study. Technical terms, lists of data and detailed explanations of scientific reasoning are avoided.	rating*
4.5.2	The summary is comprehensive, containing at least a brief description of the project and the environment, an account of the main impacts and mitigation measures to be undertaken by the developer, and a description of any remaining or residual impacts. A brief explanation of the methods by which information and data were obtained, and an indication of the confidence that can be placed in them, is also included.	rating
Overall grade for category 4.5 A B C D E F <i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
Comments		
Overall evaluation of Review Area 4 A B C D E F		
Comments		

Topic 10

Decision-making

Introduction

Checklist

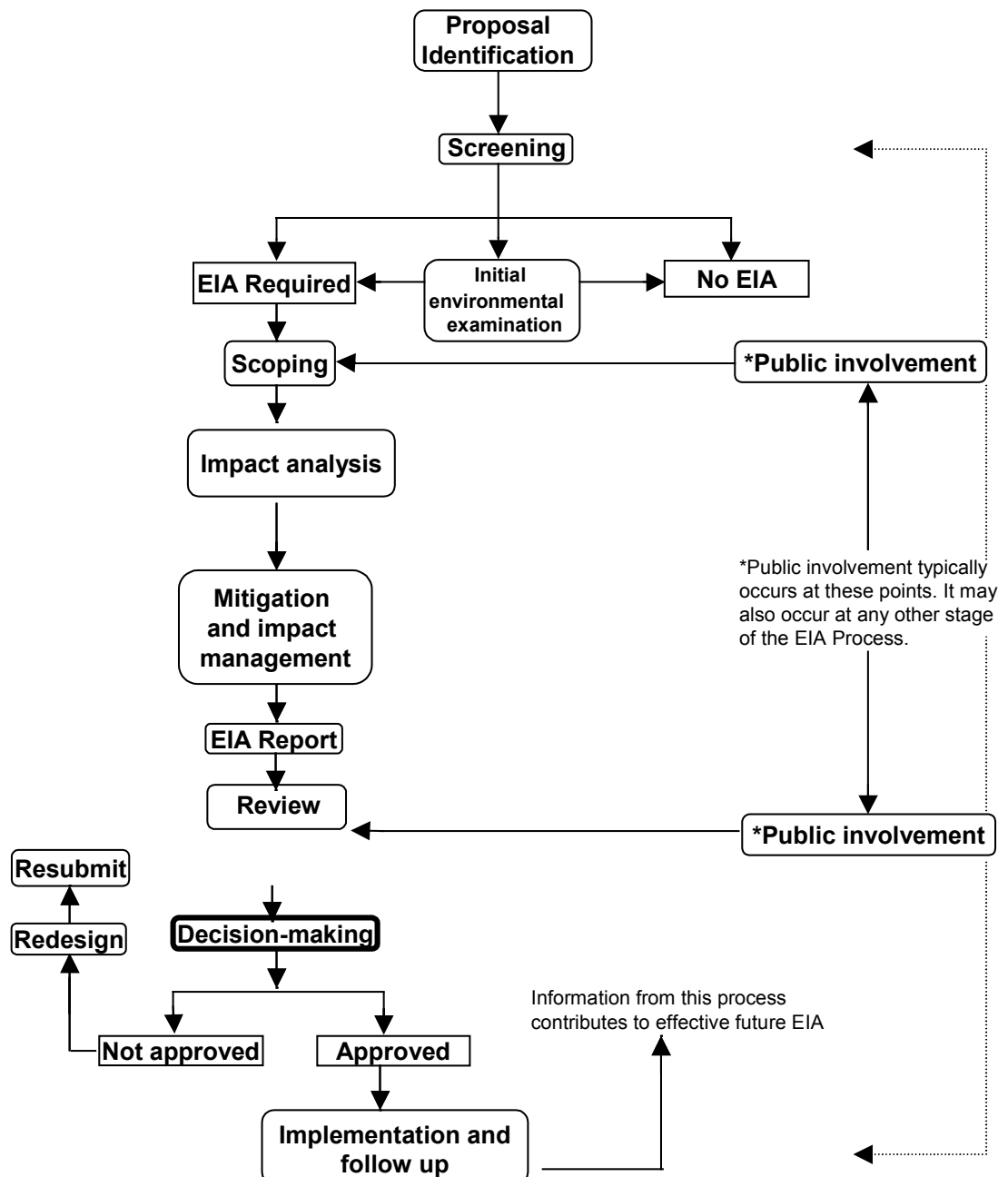
Session outline

Reference list and further reading

Training activities

Support materials

Decision-making in the EIA process



Topic 10—Decision-making

Objectives

To describe the role and contribution of EIA in the decision-making process, particularly the final approval of the proposal.

To understand the broad trade-offs that must be made among environmental, economic and social factors in decision-making and condition setting.

Relevance

The EIA process was introduced with the express intention of incorporating environmental considerations into decision-making on major proposals. All of those involved in EIA require an understanding of how the decision-making process operates and the particular contribution made by EIA.

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:

- ☐ an outline of the steps in the local decision-making process;
- ☐ examples of decision documents, such as approvals or authorisations (permits, licenses, conditions, etc.) that are used locally;
- ☐ a statement of 'reasons for the decision' that has been issued locally;
- ☐ a list of procedural checks and balances in the EIA system that help reinforce accountability in decision-making;
- ☐ an EIA report that contains information used in decision-making;
- ☐ copies of any research focused on local decision-making;
- ☐ contact names and telephone numbers of people, agencies, organizations and environmental information/data resource centres able to provide assistance in relation to decision-making; and
- ☐ other resources that may be available such as videos, journal articles, computer programmes, lists of speakers, and case studies.

Session outline

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 they are important.



1

This topic focuses on the relationship of EIA and decision-making. A broad view is presented of decision-making as an on ongoing process extending from project inception to implementation. In that context, particular emphasis will be given to the stage of final approval and authorisation of a proposal.



2

Introduce the concept of decision-making and its importance in the EIA process. Briefly describe the different roles and responsibilities of those who carry out EIAs and those who make decisions on the merits of a proposal.



3

Decision-making is the process of choosing between alternative courses of action. This process is essentially political in nature. It involves weighing the benefits and costs and making trade-offs among a range of considerations. Often, the views of interested parties are represented directly and decisions are made through an incremental process of negotiation, bargaining and compromise. For major proposals, a number of formal instruments can be used to develop the information necessary for sound decision-making.

In this context, EIA is an information gathering process, which is intended to facilitate environmentally sound decision-making. This process culminates in a final decision on whether or not a proposal is acceptable, and under what conditions. When the term 'decision-making' is used in EIA it is usually taken to mean the final approval of a proposal. However, a series of 'interim' decisions about the proposal are made throughout the EIA process; examples include the selection of a preferred alternative and making planning and design modifications to the initial proposal.

Depending upon the EIA arrangements that are in place, these interim decisions may be made by different parties. For example, at the screening and scoping stages, the responsible authority usually decides the disposition of the proposal. During EIA preparation, the proponent often modifies the proposal to make it more environmentally and socially acceptable. The final approval of the major proposal is normally a political decision, often taken by the national government, planning authority or other equivalent body. In some EIA systems, the approval is a pre-requisite to gaining other

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necessary authorisations, such as licenses and permits, which are issued by regulatory agencies.

Describe the responsibilities of the decision-maker in the EIA process, and consider how they might be reinforced.

Decision-makers at all levels now have well understood environmental responsibilities. At a general level, these responsibilities are outlined in the Rio Declaration on Environment and Development and Agenda 21, the principles and programme of action to which all countries that attended the Earth Summit are politically committed (see Topic 1 – *Introduction and overview of EIA*). EIA is identified as a key instrument to integrate environmental and social considerations into development decision-making. Its application is strengthened when used with the precautionary principle and other key guidelines for decision-making endorsed at Rio.

However, too many decision makers still regard EIA negatively, as an imposition or even an impediment rather than an opportunity to add value to development proposals and to safeguard critical resources and environmental functions. Meanwhile, UNEP, the World Bank and other international organisations have warned that global environmental change may be reaching critical thresholds, and report increasing pressures on land and water resources in many parts of the world. Often these issues affect the poor and impoverished most, undermining the resource base upon which they depend and reducing their prospects for secure and sustainable livelihoods.

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 (and SEA);
- EIA requirements, principles and guidelines that are applicable;
- the effectiveness of their implementation and the implications for decision-making;
- limitations that may need to be placed on information and advice contained in an EIA report;
- 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 authorisation of proposals subject to EIA.



4



5

The sustainability agenda places further obligations on decision-makers. In order to meet them, decision-makers need to have the requisite 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, including SEA for proposed policies and plans and environmental accounting to gain a realistic measure of macro-economic progress.

Using a local proposal (real or simulated) as the basis for discussion, ask the participants to identify the different types of interim decisions that are made throughout the applicable EIA process and specify who might be responsible for making them.

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, minimise or compensate for impacts; and
- review – to determine the quality and adequacy of the EIA report as a basis for approval of the proposal.



6

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 favourable, 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 iterative, 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.

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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 authorisation of a proposal enforced during the implementation phase?

Now focus the discussion on final approval of the proposal. Outline the nature of the decision-making process and the factors that are important. Emphasise that information from an EIA is only one of the inputs taken into consideration.



7

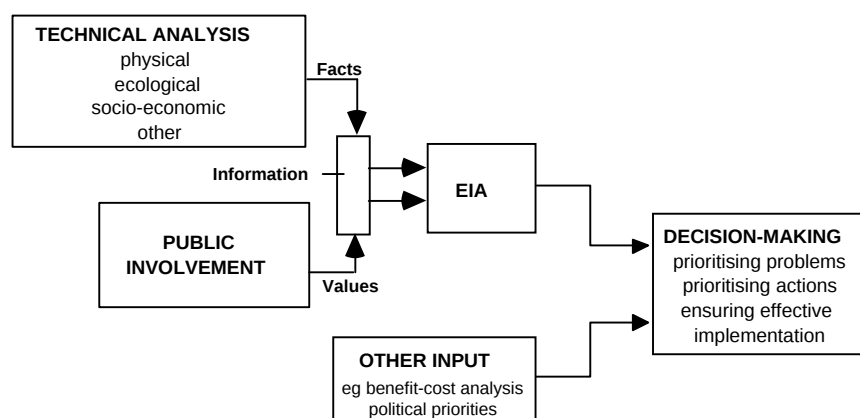


Figure 1: EIA as part of the decision-making process

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

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 (see Topic 8 – *EIA Reporting*). 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).



8

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.

The so-called 'big dams' debate exemplifies this aspect of decision-making. The largest and most controversial schemes, represented by the Three Gorges (China) and Sardar Sarovar (India) schemes, have provoked international debate over the advisability of building them and the adequacy of the EIA process that was applied. A summary of the issues associated with the Sardar Sarovar scheme is given in Box 1 and can be reviewed to see if there are for points of comparison with projects undertaken locally. Further information can be found in the report of the World Commission on Dams (see <http://www.dams.org>).

Box 1: Sardar Sarovar scheme, India

Sardar Sarovar is an irrigation scheme located in a drought prone region. It involves the construction of a high dam on the Narmada River, a reservoir of 37,000 hectares in three states and an irrigation network 75,000 km in length and occupying a further 80,000 hectares of land. A population of one-quarter million will be relocated, many of them tribal people. Thousands more, living downstream below the dam, also will be adversely affected.

As a result of the scale of these impacts, Sardar Sarovar came to symbolise the pros and cons of large-scale development both in India and internationally. Some see it as a project that will bring major economic benefits to millions; others regard it as environmentally and socially destructive. The relocation of tribal people, who had no formal title to land, also raised broader issues of human rights. Finally, the project, now in its final stages, was heavily criticised because the EIA and SIA processes were considered deficient in taking the full range of impacts into account.

In 1992, the scheme was the subject of an independent World Bank review, which was triggered by its loan agreement with the governments involved. The review concluded the scheme was beset by profound difficulties, which included inadequate data, failure to consult with the people affected and the lack of appropriate EIA and mitigation.

Source: Berger, 1994

Outline the types of information in an EIA report that could be required by a decision-maker in order to make a final decision. Use a local case study or EIA report to demonstrate how the types of information listed in the table could be best presented.

A summary of *Information considered important for decision-makers* is given in Box 2 and is available as a handout. 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.



10-1

Box 2: Information considered important for decision-makers

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 involvement

- key public views
- concerns of affected communities
- areas of agreement and disagreement

Impact analysis

- 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)

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Discuss whether or not the decision-maker is required to consider the findings of the EIA report under local arrangements and summarize the requirements in other systems. Outline the range of possible outcomes arising from decision-making.



9

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.



10

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.

Discuss the checks and balances that can be built into the system to ensure accountability and transparency in the process. Briefly outline some of the different ways in which the decision, and the reasons for the decision, can be made available to the public. Consider how these might work with reference to the local system of decision-making.

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 (see Box 3).

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 programme which must be adopted to ensure that any mitigation measures are implemented (*Regulations, Section 1505.2*).

Box 3: Checks and balances on decision making

Some or all of the following rules and conventions for decision-making have been adopted by leading EIA systems:

- 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)

Adapted from Wood (1995)

Briefly discuss the importance of condition setting as part of final approval. Emphasise the means for ensuring the conditions set are implemented, and relate these to the level of confidence associated with key findings of EIA.

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.

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Other topics in the manual consider the means for implementation of the approved conditions (see Topic 7 – *Mitigation and impact assessment* and Topic 11 – *Implementation and follow up*). These include:

- establishing performance standards for meeting the conditions, preferably as part of a legally binding contract with the proponent;
- requiring the proponent to prepare (or revise) an environmental management plan (EMP) to incorporate these standards and translate the approved conditions into a schedule of actions;
- incorporating environmental management systems (EMS) to ISO 14000 standards into the EMP; and
- enforcing compliance with the conditions of approval and performance standards, with penalties for unwarranted breaches.

Finally, emphasise that to achieve good environmental outcomes the conditions that are set as part of approvals must be implemented and, if necessary, altered to take account of unanticipated impacts or ineffective mitigation. These aspects are discussed in the next Topic – *Implementation and follow up*.

Include a training activity to reinforce the topic (if desired). Conclude by summarizing the presentation, emphasising the key aspects of the topic that apply locally.

Reference list

The following references have been quoted directly, adapted or used as a primary source for major parts of this topic.

Glasson J (1999) Environmental Impact Assessment – Impact on Decisions in Petts J (ed) *Handbook of Environmental Impact Assessment*. Volume 1 (pp121-144). Blackwell Science Ltd, Oxford, UK.

OECD/DAC (1994) *Towards Coherence in Environmental Assessment: Results of the Project on Coherence of Environmental Assessment for International Bilateral Aid*. 3 Volumes. Canadian International Development Agency, Ottawa.

Sadler B (1997) EIA Process Strengthening – perspectives and priorities. In *Report of the EIA Process Strengthening Workshop* (pp. 1-29). Environment Protection Agency, Canberra.

Wood C M (1995) *Environmental Impact Assessment: A Comparative Review*, Longman Higher Education, Harlow, UK.

Further reading

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

Scott Wilson Ltd (1996) *EIA: Issues, Trends and Practice*. The Environment and Economics Unit UNEP, Nairobi.

Training activities

Training activities may 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

- 10-1 Should the final approval of a proposal be a political decision? Discuss the arguments for and against this position, and relate them to the EIA system that is applicable locally.
- 10-2 How can interim decisions facilitate informed approval and condition setting?
- 10-3 What importance should be attached to the findings of an EIA report compared to other inputs, in general, and economic considerations, in particular? How could the process of making trade-offs be improved?
- 10-4 What types of information are necessary for decision-makers to understand the environmental consequences of a proposal? How should EIA practitioners best present this information?
- 10-5 What means will be appropriate to ensure the conditions attached to approval are implemented? How should the overseeing agency address a serious breach of conditions?

Speaker themes

- 10-1 Invite a decision-maker who has experience in approving proposals that have been subject to EIA to discuss the decision-making process. How have decisions been made? What types of information have proven useful/not useful? What problems have been encountered in making trade-offs and how were these resolved?
-

Group Activity 10–1: Decision-making

Title: Making decisions

Aim: To develop an understanding of how the decision-making process operates and the issues that are important.

Group size: Pairs for the first part, then whole group.

Duration: Half-day

Resources required:

- ☐ An EIA report, with an executive summary.
- ☐ A review of the EIA report and recommendations to the decision-maker.
- ☐ Supporting materials including a summary of public comments on the EIA report, identifying areas of agreement and disagreement.
- ☐ Case notes on the background to the proposal, other types of studies undertaken, controversial issues and external pressures, etc.

Description of activity:

Taking the resource materials:

- ☐ Each pair is to review the information and develop a systematic approach to make a decision on the proposal; and on this basis, approve or reject the proposal, set any necessary conditions and provide a one-page written reasons for the decision.
- ☐ Ask the whole group to represent a party (or parties) dissatisfied with the decision that has been made. Each pair is to justify their reasons for the decision under questioning from this audience (allow approximately ten minutes per pair).



1



2



3



4



5

Flowchart

EIA is a process to:

- gather information necessary for decision-making
 - inform approval and condition setting
 - help determine if a proposal is acceptable
-

Decision-making is a process of:

- political choice between alternative directions
 - weighing the benefits and costs
 - negotiation, bargaining and trade-offs
 - balancing economic, social and environmental factors
-

Decision-makers need to understand:

- EIA aims and concepts
 - EIA legislation, procedure and guidelines
 - the effectiveness of EIA practice
 - the limitations on EIA information
 - how EIA process and practice measure up internationally
 - issues of public consultation and third party challenges
-

Decision-makers should be encouraged to:

- implement sustainability mandates and commitments
 - broaden their perspectives on the environment
 - critically review information and advice
 - better communicate information and decisions
 - apply the precautionary principle
 - improve the process of making trade-offs
 - adopt more open and participatory approaches
 - use strategic tools including SEA and environmental accounting
-



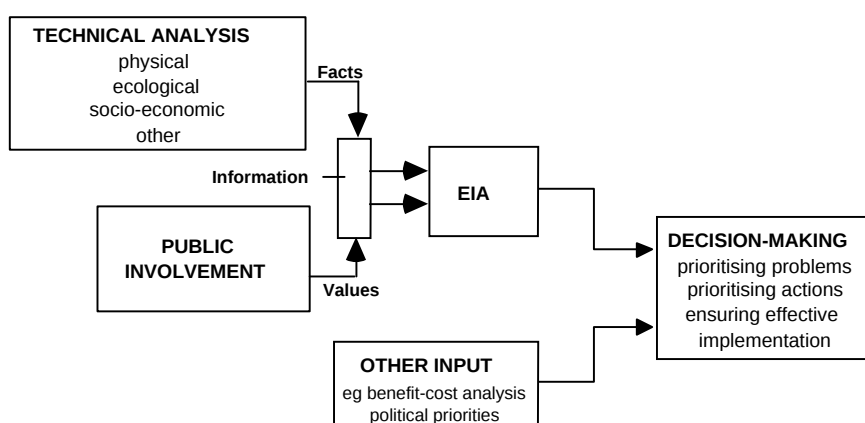
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Decision-making is a continuing process, comprising:

- interim decisions made at each stage of EIA
- final approval of a proposal
- enforcement of conditions attached to approvals



7



8

Information for decision-makers should include:

- background of the proposal
- policy context
- alternatives considered
- public inputs and balance of opinion
- significant impacts
- proposed mitigation and monitoring
- extent that the proposal conforms to sustainability principles



9

EIA responsibilities imposed on decision makers:

- meet no further requirements
- take account of information in the EIA report
- provide reasons for the decision
- act in accordance with recommendations of a review body



10

Outcomes from EIA decision-making:

- proposal approved
- proposal approved with conditions
- proposal on hold pending further study
- proposal returned for revision and resubmission
- proposal rejected



11

Checks and balances on decision-making:

- no decision taken until EIA report considered
 - findings help determine approval and condition setting
 - public comment taken into account
 - approvals can be refused or withheld
 - conditions can be imposed/ modifications demanded
 - written reasons for the decision
 - right of appeal against the decision
-



12

Means of implementing the decision include:

- establishing performance conditions
 - incorporating them into legal contracts
 - requiring preparation of environmental management plans
 - incorporating ISO 14001 standards
 - overseeing and monitoring compliance with conditions
-

Information for decision-makers

Information considered important for decision-makers**Background**

- background to the project and the most important environmental issues involved

Policy context

- the basic development issue or problem being addressed (eg pollution, flooding, drought, erosion, energy shortage, poor health, depressed economy etc)
- the relationship to environmental protection goals, policies and plans

Alternatives

- alternatives to the proposal (including the best practicable environmental option [BPEO] or equivalent designation)

Public involvement

- key public views
- concerns of affected communities
- areas of agreement and disagreement

Impact analysis

- costs and benefits
- distribution of gains and losses

Mitigation and monitoring

- adequacy of proposed measures

Conclusion and recommendations

- key findings, including the main economic benefits, significant environmental effects and proposed mitigation measures (use non-technical terms)
- the extent to which the proposal conforms to the principles of sustainable development
- the design and operational changes that are considered critical in improving the environmental acceptability of the project

Adapted from OECD/DAC (1994)

Topic 11

Implementation and follow up

Introduction

Checklist

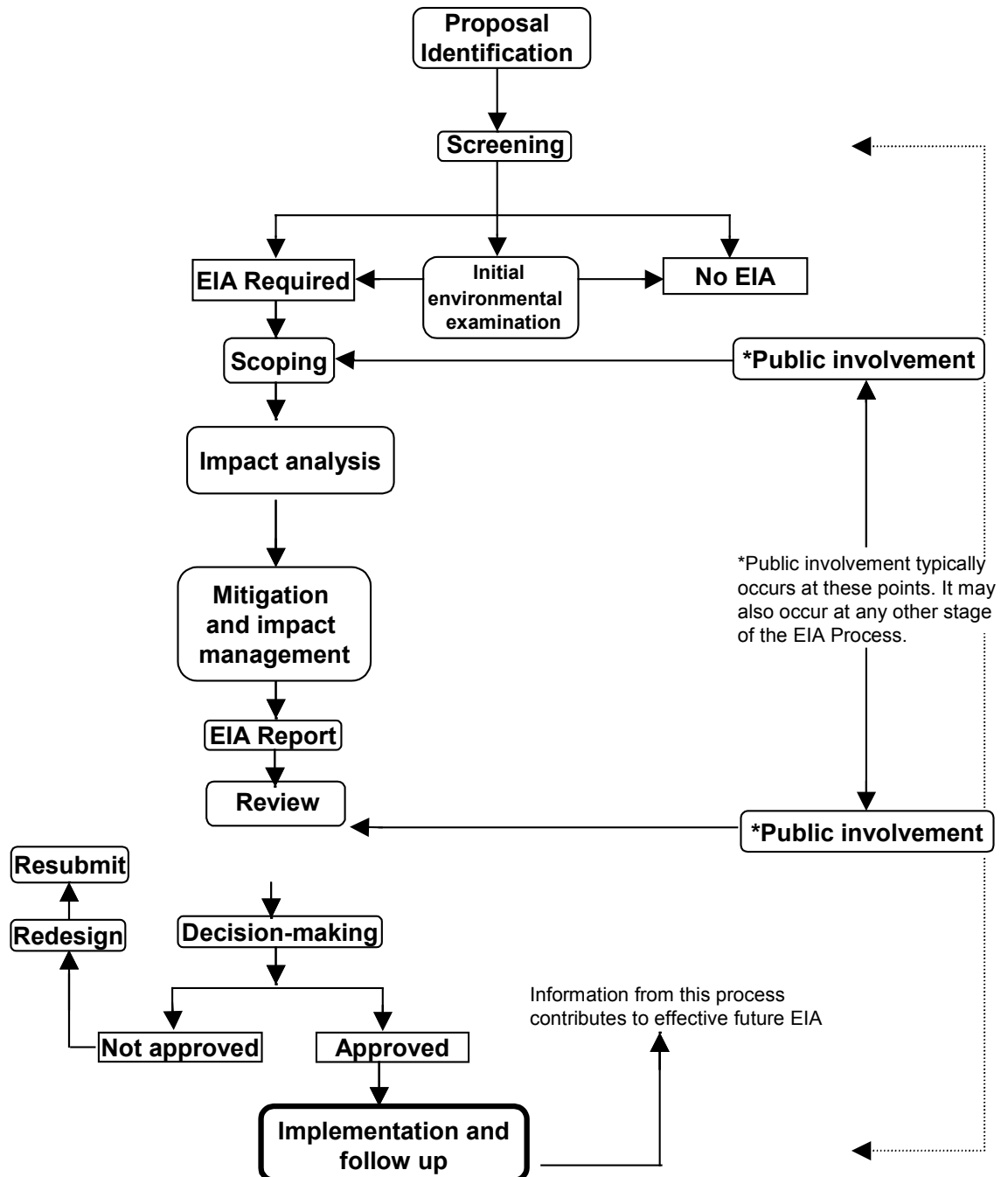
Session outline

Reference list and further reading

Training activities

Support materials

Implementation and follow up in the EIA process



Topic 11—Implementation and follow up

Objectives

To explain the role and contribution of implementation and follow up measures within the EIA process.

To understand the procedures and methods used, particularly monitoring and auditing.

Relevance

After project approval, implementation and follow up complete the EIA process. Monitoring, auditing and other tools are used to 'close the loop' of impact prediction and condition setting. They are important for several reasons: to identify the impacts that occur; to check that these are within the levels predicted and required by legislation; to determine that mitigation measures are properly implemented and work effectively; to ensure the environmental benefits expected are being achieved; and to provide feedback to improve future applications of the EIA process.

Timing

3 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 materials, as appropriate:

- ☐ applicable requirements relating to implementation and follow up of proposals;
- ☐ applicable procedures and guidelines for surveillance, monitoring, auditing, etc.;
- ☐ local examples of the use and results of monitoring and auditing;
- ☐ local examples of the use of environmental management plans;
- ☐ local examples of post-project analysis, EIA performance review or similar exercises;
- ☐ copies of any research or studies on the monitoring, impact management and follow up activities;
- ☐ contact names and telephone numbers of people, agencies, organizations and environmental information/data resource centres able to provide assistance in relation to monitoring and auditing; and
- ☐ other resources that may be available such as videos, journal articles, lists of speakers, and case studies.

Session outline

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 they are important.

Implementation and follow up are critically important but relatively neglected stages of the EIA process. Surveillance, monitoring, auditing, evaluation and other tools allow for ongoing assessment and review of the effects of the proposal, following final approval. They are used to identify the impacts that occur; check that these are within the levels predicted and required by legislation; determine that mitigation measures are properly implemented and work effectively; ensure the environmental benefits expected are being achieved; and provide feedback to improve future applications of the EIA process.

Outline the need for and purpose of EIA implementation and follow up, emphasising their contribution to achieving good environmental outcomes. Ask the participants if key objectives are relevant to EIA practice locally.

Until recently, relatively little attention was paid to the actual impacts that occurred during project construction and operation. Without appropriate implementation and follow up to decision-making, EIA becomes a paper exercise to secure an approval, rather than a practical exercise to achieve environmental benefits (see Topic 7 – *Mitigation and impact management*). The purpose of EIA implementation and follow up is to ensure that the conditions attached to project approval are carried out and function effectively, and to gain information that can be used to improve EIA practice in the future.

By itself, this process cannot turn around an environmentally unsound project. However, it is critical to maximise the returns from the preparation of the EIA report and its consideration in decision-making. EIA implementation and follow up allow the measures and conditions attached to project approval to be fine tuned in the light of new information. When used systematically, they facilitate impact management, build continuity into the EIA process and help to optimise environmental benefits at each stage of project development.

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1

Key objectives of EIA implementation and follow up are to:

- confirm that the conditions of project approval are implemented satisfactorily;
- verify that impacts are within predicted or permitted limits;
- take action to manage unanticipated impacts or other unforeseen changes;
- ensure that environmental benefits are maximised through good practice; and
- learn from experience in order to improve EIA process and practice.

Identify the components of EIA implementation and follow up, and define key terms. Ask the participants to indicate which ones are used in the EIA system locally, noting similarities and differences in terminology.



2

The main components and tools of EIA implementation and follow up include:

- surveillance and supervision – to oversee adherence to and implementation of the terms and conditions of project approval;
- effects or impact monitoring – to measure the environmental changes that can be attributed to project construction and/or operation and check the effectiveness of mitigation measures;
- compliance monitoring – to ensure that applicable regulatory standards and requirements are being met, e.g. for waste discharge and pollutant emissions;
- environmental auditing – to verify the implementation of terms and conditions, the accuracy of the EIA predictions, the effectiveness of mitigation measures, and the compliance with regulatory requirements and standards;
- ex-post evaluation – to review the effectiveness and performance of the EIA process as applied to a specific project; and
- post-project analysis – to evaluate the overall results of project development and to draw lessons for the future.

These components are variously defined and delineated in the institutional arrangements and procedures established for this purpose by different countries. However, their generic functions are reasonably well understood. Key terms are described in the accompanying box, and reference is made to the different types of monitoring, auditing and evaluation that may be undertaken as part of EIA implementation and follow up. The usage of these

tools will vary, depending on terms of project approval and circumstances (as discussed later).

A conceptual distinction can be drawn between the respective aims of impact management and review and feedback of experience. In practice, however, these control and learning functions are not clearly separable. Rather they form part of a continuum of implementation and follow up activities, which are concerned with optimising environmental protection through good practice at all stages of project development. This process, when integrated with other environmental management and review tools, can be extended over the whole life cycle of the project.



11-1

Box 1: Terminology of EIA implementation and follow up

Implementation and follow up are the terms used here to refer to all EIA related activities that take place after an approval decision is made. The main functions include:

Surveillance and supervision

Surveillance of the implementation of EIA terms and conditions can be undertaken by regular or periodic site inspections to check on compliance, observe progress and discuss issues. Supervision implies a more intensive direction of the environmental performance of on-site activities, ensuring they are carried out in accordance with the environmental management plan and/or contract specifications.

Monitoring

Monitoring refers to the collection of data through a series of repetitive measurements of environmental parameters (or, more generally, to a process of systematic observation). The main types of EIA monitoring activities are:

- Baseline monitoring – the measurement of environmental parameters during a pre-project period for the purpose of determining the range of variation of the system and establishing reference points against which changes can be measured.
- Effects monitoring – the measurement of environmental parameters during project construction and implementation to detect changes which are attributable to the project.
- Compliance monitoring – the periodic sampling or continuous measurement of environmental parameters to ensure that regulatory requirements and standards are being met.

Auditing

Auditing is a term borrowed from accounting to describe a systematic process of examining, documenting and verifying that EIA procedures and outcomes correspond to objectives and requirements. This process can be undertaken during and/or after project construction, and draws upon surveillance reports and monitoring data. The main types of EIA related audits are:

- Implementation audits – to verify that EIA implementation met the conditions of project approval.
- Impact audits – to determine the impact of the project and the accuracy of EIA predictions.
- Compliance audits – to verify that project impacts complied with environmental standards and regulatory requirements.
- Effectiveness or policy audits – to check the feasibility of mitigation measures and the consistency of EIA practice.

Evaluation

Ex-post evaluation involves a policy-oriented review of the effectiveness and performance of the EIA process. It is concerned with the overall 'balance sheet' of an EIA, looking at what it achieved, which aspects were influential, and how the process could be improved. The guiding concepts are:

- Effectiveness – the extent to which the EIA process has achieved its purpose(s). Depending on how these are defined, an effectiveness review can be conducted against the terms of reference, the information provided to decision-makers or principles and criteria of EIA good practice (see Topic 1 – *Introduction and Overview of EIA*).
- Performance – the success of the EIA process as measured by its outcomes and results, e.g. the environmental benefits achieved or the effectiveness of mitigation in avoiding or reducing impacts. Surveillance, monitoring and auditing data are necessary for this purpose.

Post project analysis

Usually, a post-project analysis is undertaken once the project has been constructed and is about to enter the operational phase. The term implies a focus on project-specific EIA experience, e.g. in relation to dams, highways, waste disposal sites or power generation. In this context, post-project analysis can include aspects of effectiveness and performance review, using impact and mitigation data from surveillance, monitoring and auditing.

Sources: Au and Sanvicens (1997) and Sadler (1988, 1998).

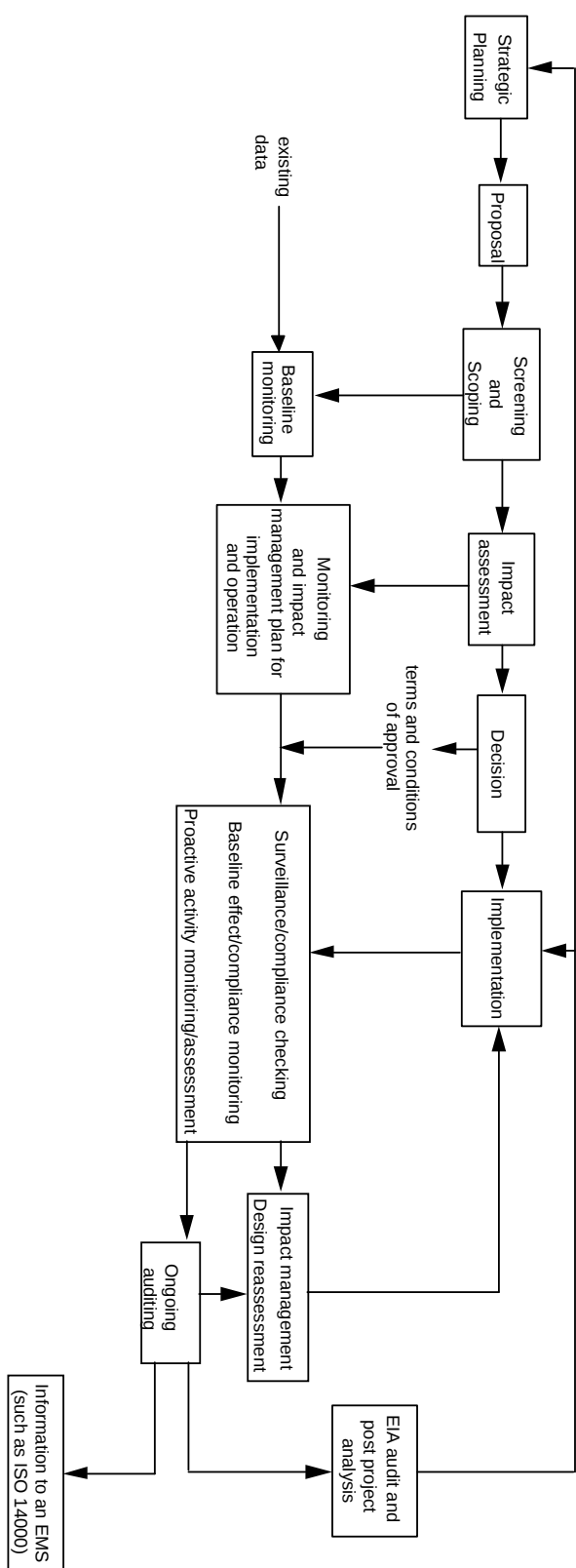


Figure 1: The role and position of monitoring and management in EIA

Adapted from Sadler (1988)

Briefly relate EIA implementation and follow up to the other stages of the EIA process and to the larger range of tools used in environmental management and review. Ask participants to identify which of these tools are used or relevant locally.

The role and contribution of EIA implementation and follow up are shown in Figure 1 above. It illustrates:

- the relationship of EIA implementation and follow up to other stages of the EIA process;
- the stages at which monitoring, auditing and evaluation are typically undertaken; and
- the results and benefits that can be gained from their use.

The figure also illustrates the importance of early identification of follow up requirements and measures, beginning at the stage of screening and scoping, and adding to them as new information becomes available. Increasingly, the preparation of an environmental management plan (EMP) provides the blueprint for carrying out EIA implementation and follow up (see Topic 7 – *Mitigation and impact management*). An EMP should include a schedule of actions for this purpose, identify protocols for impact management in the event of unforeseen events and specify the arrangements for the use of surveillance, monitoring, auditing and other procedures.

EIA implementation and follow up can occur throughout project construction and continue into the operational phase, becoming part of a larger process of environmental management and performance review. The tools for this purpose have developed rapidly. In particular, environmental management systems (EMS) are now widely used by industry and business to manage the impact of their activities on the environment. The ISO 14000 series provides a framework of EMS principles, guidance and procedure, including environmental auditing, performance review and life cycle assessment or analysis. In the box below, these are grouped according to their primary use and purpose.

Some of these tools are still under development, and their use and even terminology varies. Certain aspects of the ISO 14000 series have yet to be finalised. Already, however, there is an increasing recognition of the benefits to be gained by linking EIA preparation and implementation to EMS design and development; for example, initially through the transfer of information and subsequently through the use of standardised procedures. Looking ahead, EIA and EMS can be combined with other tools to take an integrated approach to the total environmental impact of the project cycle, along the lines indicated in Box 2.



3 & 4

Box 2: Tool box for environmental management and performance review

Purpose	Examples of available tools
Internalising the environment in policy and planning	SEA, technology assessment, comparative risk assessment
Planning and designing environmentally sound projects	EIA, SIA, risk assessment, environmental benefit cost assessment
Environmental management of the impacts of an operating facility or business enterprise	EMS (ISO 14000 series), total quality environmental management (TQEM), industrial codes of practice
Eco-design of processes and products	Environmental design, life cycle assessment, cleaner production
Monitoring, audit, and evaluation of performance	Effects and compliance monitoring, site, energy, waste, health and safety audits, benchmarking performance

Explore with the group guiding principles and elements of approach to EIA implementation and follow up. Ask participants whether and how these might be applicable locally, noting the arrangements made by different countries for this phase of the EIA process.



5

Guiding principles for carrying out the process of EIA implementation and follow up include the following:

- the project should be carried out in accordance with conditions of approval and the commitments made in the EIA report/EMP;
- surveillance and inspection should be a routine elements for this purpose;
- the scope of other follow up activities should be commensurate with the significance of the potential impacts; and
- monitoring, auditing and evaluation should be undertaken when
 - potential impacts are likely to be significant,
 - mitigation measures are untried or their outcome is uncertain, and/or
 - new aspects of EIA process and practice have been introduced.

A comprehensive approach to EIA implementation and follow up would include many or all of the following steps and elements:

- inspect and check the implementation of terms and conditions of project approval;

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- review the environmental implications of any changes that are required;
- monitor the actual effects of project activities on the environment and the community;
- verify compliance with regulatory requirements and applicable standards or criteria;
- take action to reduce or rectify any unanticipated adverse impacts;
- adjust the EMP, project specifications and related schedules as necessary;
- audit the accuracy of the EIA predictions;
- evaluate the effectiveness of the mitigation measures; and
- provide feedback to improve EIA process and practice in the future.

The elements of approach to EIA implementation and follow up differ from country to country. A variety of arrangements, as well as instruments, are used. In some EIA systems, provision for monitoring and other follow up activities is made in legislation, although it may apply only to certain project categories or take place under the permitting and licensing processes of regulatory agencies. In other cases, EIA follow up is a discretionary process, which is carried out on a project-by-project basis by administrative, contractual or informal means.

Review the aspects and issues that need to be considered in designing and carrying out an EIA implementation and follow up programme. Discuss how to determine the scope and components of such a programme and ask participants to relate local experiences in this area.

EIA implementation and follow up can be time consuming and expensive, and not all projects warrant full attention. A disciplined approach should be taken to planning this phase of the EIA process. Surveillance to oversee EIA implementation and ensure compliance with conditions of approval and regulatory standards is usually the bare minimum requirement. Other follow up activities should be determined on the basis of the needs of environmental management and the potential pay off for improving EIA practice in the future.

The scope of follow up should be determined early in the EIA process. A decision should be made as part of the screening and scoping process, when requirements are established for baseline studies and monitoring. In part, these decisions determine what can be done in EIA follow up, for example by establishing the information that will be available for effects monitoring and audit. Later, the scope of the EIA follow up programme can be refocused as more detailed information on potential impacts becomes available.



6

Key criteria for determining the need for and scope of EIA implementation and follow up include:

- the degree of confidence or uncertainty attached to impact predictions;
- the level of risk and damage if unanticipated impacts occur;
- the significance of losses if controls are not properly implemented; and
- the opportunity to gain information that will add value to EIA practice.

Aspects and issues that need to be considered when designing and carrying out an EIA implementation and follow up programme include:

- *What is required?* – Identify the scope and components of the programme, and, if necessary, provide a justification and prioritise follow up actions.
- *Who will carry out the activities?* – Indicate the roles and responsibilities of key agencies and individuals, noting how these will be coordinated and emphasising any research aspects that may have been added subsequent to the project approval, EMP or other core documents.
- *How will the programme be carried out?* – Specify the resources, expertise and arrangements necessary to give effect to EIA follow up and to report the results.

Stress the importance of monitoring as a vital component of the EIA process, and describe its relationship to implementation and follow up in general, and impact management in particular. Ask participants to identify the monitoring methods and arrangements that are in place locally.

Monitoring is a cornerstone of EIA implementation and follow up. Other components are dependent on the scope and type of monitoring information that is provided. The primary aim of monitoring is to provide information that will aid impact management, and, secondarily, to achieve a better understanding of cause-effect relationships and to improve EIA prediction and mitigation methods. Both the immediate and long-term benefits from undertaking monitoring as part of EIA are widely recognised, although not always realised.



7

Monitoring is used to:

- establish baseline trends and conditions;
- measure the impacts that occur during project construction and operation;
- check their compliance with agreed conditions and standards;
- facilitate impact management, e.g. by warning of unanticipated impacts; and
- determine the accuracy of impact predictions and the effectiveness of mitigation measures.

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A sound baseline is a critical reference point for the conduct of effects monitoring. In turn, effects monitoring establishes the basis for corrective action when actual impacts are unanticipated or worse than predicted. Compliance monitoring, carried out through repetitive or periodic measurement, also can be used for this purpose. This may suffice as a safety net for certain projects, for example, where the mitigation measures are well tried and known to be effective. However, compliance monitoring will trigger impact management only if regulatory standards or specified conditions are exceeded and, on its own, may be insufficient for large-scale, complex projects.

By themselves, compliance and effects monitoring permit only reactive impact management, since they detect violations or adverse changes after the fact. In this context, it is important to tie the results of both types of monitoring to pre-determined actions (or emergency responses), which are triggered on a threshold basis. A more proactive, adaptive approach to impact management can be instituted by combining compliance or effects monitoring with supervision or regular inspection of site clearance, construction and mitigation activities. The use of the precautionary principle can facilitate early warning of emerging problems.

Emphasise the need for monitoring programmes to be carefully targeted and cost-effective. Ask the participants if there is any experience locally on this aspect of EIA follow up, and what resources might be available.

The collection of monitoring data is expensive. It needs to be targeted at the information necessary to manage the impacts that are significant or review the aspects of EIA practice that are of particular importance. These aspects should be identified as early as practicable in the EIA process to optimise the contribution of monitoring data to EIA implementation and follow up. Monitoring involves designing the programme, collecting and analysing the data, establishing their linkage to impact management, auditing and other components, and interpretation and reporting of data.

The following points need to be agreed as part of the EMP and conditions of project approval:

- major impacts to be monitored;
- objectives of monitoring and data requirements;
- arrangements for the conduct of monitoring;
- use of the information to be collected;
- response to unanticipated or greater than predicted impacts; and
- measures for public reporting and involvement.



8

Monitoring requirements should focus on the significant impacts predicted in the EIA report, taking account of:

- the environmental values to be safeguarded;
- the magnitude of each potential impact;
- the risk or probability of each impact occurring;
- the pathways and boundaries of each impact; and
- the confidence in the prediction of each impact.

Monitoring programmes need to be constantly reviewed to make sure that relevant information is being supplied, and to identify the time at which they can be stopped.

Outline the basis for a scientifically credible monitoring programme. Provide participants with general information about how data can be collected and analysed, and draw attention to the role of independent checks.

Each discipline has established methods for monitoring and data collection. For example, the design of a programme to monitor the impact of a large-scale project involving discharge of toxic waste or effluent into a water body may encompass different methods to measure change in water quality, food chains, fish reproduction, reduction in income from fisheries and its effect on the local community. Generally, monitoring to detect chemical and physical changes is more straightforward than for biological effects or ecological relationships. Socio-economic impacts present a special challenge of measuring changes in collective behaviour and response (see Topic 6 – *Impact analysis*).

The general approach to effects monitoring is to compare the pre- and post-project situation, measuring relevant environmental impacts against baseline conditions. A common issue in all situations is how to differentiate the change attributable to a project from the variability that characterises all biophysical or socio-economic systems. In the real world, as opposed to laboratory experiments, cause-effect relationships are difficult to separate from the interaction of other factors. Eliminating or correcting for these intervening variables is the key to the design and conduct of a scientifically defensible effects monitoring programme.

Typically, this problem is addressed by establishing impact and control monitoring stations. The impact or treatment site is selected to be a receptor of an emission, hazard, event or action from the project. An example would be a water sampling station downstream from an effluent discharge point. The control or reference site is located outside the impact zone, but chosen to be representative of the variability experienced by the impact site. 'With versus without' project comparisons then can be made to determine the change or impact that is attributable to the project.

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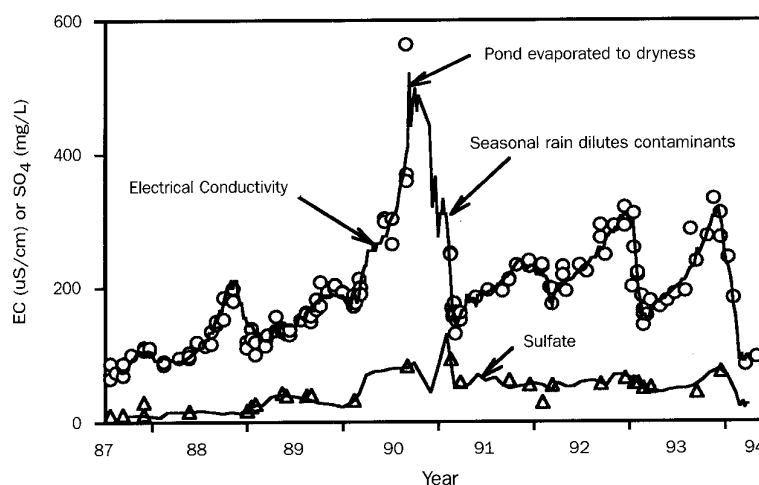
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Monitoring programmes result in time series data, which can be analysed by:

- assembling the data in tabular or graphic format;
- testing for variations that are statistically valid;
- determining rates and directions of change; and
- checking these are within expected levels and comply with standards (e.g. water quality).

Some relational changes, such as in chemical constituents in water, can be presented graphically. Longitudinal studies based on numerical data or photographic or descriptive records also provide relevant information on changes and trends. The figure below is an example of monitoring data. It depicts the variation in contaminant levels and their relation to seasonal precipitation, including the effect of an extreme event (drought) on sulphate concentration. Also shown are the independent checks made by the regulatory agency on a proponent's data.

Monitoring data needs to be interpreted and reported to a non-scientific audience, including decision makers, the affected community and the general public. This may be the responsibility of a regulatory body, monitoring team or multi-stakeholder group, established specifically to bring a broad understanding and a range of views to EIA implementation and follow up. Where different types and methods of monitoring have been carried out, the comparability and quality of the data sets may need to be addressed and reported. Reports should be in plain language and to appropriate technical standards (see also Topic 8 – *EIA reporting*).



EPA, (1995) Δ , O regulator's independent checks of SO_4 and EC respectively

Figure 1:Proponent long-term monitoring showing seasonal variations



11-2

Using a local example or Handout 11-2, discuss the elements and steps in developing a credible and effective environmental monitoring programme.

Appropriate guidance should be sought when developing an environmental monitoring programme. Typically, some or all of the following issues will be addressed:

- representative impact and reference sites;
- methods for sampling and collection of data;
- independent checks for quality control and assurance of data;
- basis for statistical interpretation and inference of impacts;
- protocols for the conduct of environmental auditing; and
- mechanisms for reporting data and responding to issues that are raised.



10

Some elements of an effective environmental monitoring programme are listed in Box 3. The following steps can help to implement these elements:

- define the scope and objectives of monitoring for each impact;
- identify the sites for observation, measurement and sampling;
- select the key indicators for direct measurement or observation;
- determine the level of accuracy required in the data;
- consider how the data will be analysed in relation to baseline and other data;
- establish a system for recording, organising and reporting the data;
- specify thresholds of impact acceptability; and
- set requirements for management action if monitoring indicates these are exceeded.

When adapting these to scale and circumstances, those responsible for developing monitoring programmes should consider the value of simple observation and reporting, particularly by locally affected parties. Increasing attention is being given to public involvement in the EIA implementation and follow up. For example, stakeholder or citizen monitoring committees have been used in a number of cases. The terms of reference can be written into EIA documentation and include building a long-term relationship with an affected community or group of stakeholders when the project is complex and controversial.

Box 3: Effective environmental monitoring programmes have:

- a realistic sampling programme (temporal and spatial)
- sampling methods relevant to source and/or type of impact
- a targeted approach to data collection
- comparability of data with baseline and other relevant data
- quality control in measurement and analysis
- systematic record keeping and database organisation
- reporting requirements for internal and external checks
- provision for input from and response to third parties
- presentation of results to the public



11-3

Discuss how to implement a monitoring programme. If there is a local case study available use this to explore the costs of monitoring and discuss how these might be offset by the benefits that can be derived from monitoring information. Where no detailed local costings are available, use the materials in Handout 11-3 to discuss possible costs of procedures.

A budget for the monitoring programme needs to be drawn up and the resources and personnel necessary to carry them out specified. Normally, this will be finalised as part of preparation of the EMP. Alternatively, this can be undertaken as a separate exercise, as part of detailed project specifications or incorporated into permitting, licensing or contracting. The latter instruments have advantages in ensuring compliance and enforcement of monitoring and other follow up requirements, but they are not in place in all EIA systems.

The costs of EIA related monitoring can vary greatly, depending on the project, the location, the environment affected and the potential significance of the impacts. Other things being equal, the greater the level of uncertainty about potentially significant impacts, the higher the cost of monitoring to obtain information that is relevant to impact management and improved understanding. However, the costs can be offset by the benefits which monitoring brings. These may include immediate savings gained by timely action to correct unanticipated impacts.

Depending on the nature and severity of the impact, this might involve one or more of the following measures:

- stopping or modifying the activity causing an excessive impact;
- imposing penalties or prosecution where conditions and standards are breached; and



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- scaling up or adding mitigation measures (in situations where this is possible).

Longer-term gains can also accrue from baseline and effects monitoring. For example the data can be used to establish a reference basis for managing environmental impacts throughout the life of the project. This information will be particularly helpful to the design of an EMS to address the environmental aspects and impacts of the operational phase of the project. Wherever possible, the inputs from monitoring, auditing and other components of EIA implementation and follow up should be integrated into this framework.

Now consider the role of auditing in EIA implementation and follow up, noting its relationship to other types of environmental audit undertaken as part of an EMS. Ask participants to discuss local experience with EIA and EMS auditing.

Environmental auditing is a review process similar to that carried out in financial accounting. Both result in a statement of facts, which certifies that practice is (or is not) in accordance with standard procedure. In the case of environmental auditing, there is an added level of interpretation, focusing on the factors of performance. The concern is to identify how the aspects, processes or systems under review can be improved.

The main techniques for conducting an environmental audit are:

- examination of records and documentation relating to impacts, actions taken to manage them and aspects of performance;
- interviews with management and line staff to corroborate factual information and probe areas of concern; and
- site inspection to check that environmental measures and controls are operating as described and intended.

A distinction can be made between environmental audits conducted as part of EIA and EMS implementation, respectively. EIA related audits, typically, are *ad hoc*, project-by-project in approach and use non-standardised methodology. EMS audits, typically, are conducted in accordance with ISO 14001 guidance and procedures, and oriented toward continuous improvement in managing the environmental impacts of an organisation, site, process, product, supply chain or input-output balances. However, both EIA and EMS audits have objectives, elements of approach and information sources in common.

EIA audits are used to:

- identify the impacts of project implementation;
- verify whether or not the conditions of approval have been implemented;



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- test the accuracy of impact predictions;
- check the effectiveness of mitigation measures; and
- improve compliance and performance of EIA practice.

EMS audits include:

- site audits – to examine all aspects of environmental management of a facility or operation;
- compliance audits – to ensure an organisation or development meets pertinent legal, regulatory and voluntary or self imposed standards such as emission limits, discharge permits and operating licenses; and
- sector or issue-specific audits – to consider key aspects of environmental management and performance, such as waste disposal, energy use, cleaner production, health and safety and supply chains.

Describe the types of information that are gained from EIA auditing and their use in improving the EIA process. Point out the importance of a well-designed monitoring programme, noting the other options for the conduct of audits when the necessary monitoring data is not available.

Guidance on the conduct of EIA audits emphasises that a well-designed monitoring programme is an integral element of good practice. The 'before and after' data collected by baseline and effects monitoring lays down an audit 'trail', which allows key impacts to be tracked and statistically verified. The case example below, from Hong Kong, illustrates the results of an EIA audit of a major project. It emphasises both the use of monitoring and audit to remedy deficiencies in EIA implementation and the difficulties of gathering evidence to verify their cause.

When selecting projects for a full audit, Hong Kong and international experience indicates that priority should be given to those:

- with a high level of environmental, social, economic or political impact and visibility;
- that can yield usable results within the existing technical and budgetary constraints; and/or
- most at risk from deficiencies in the EIA implementation and follow up system, such as limited surveillance capability or lack of authority to enforce mitigation measures.

The case example also underlines some of the difficulties commonly experienced in the conduct of EIA monitoring and audit, including:

- limited baseline information on variability and causal relationships;
- qualitative and non auditable impact predictions;



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- late changes to project design and mitigation (thereby altering the basis on which predictions are made); and
- long lead times before certain trends and impacts can be identified, for example, large scale but infrequent impacts (such as oil spills) or low dose, repetitive effects (such as exposure to heavy metals).

Other more flexible, less data demanding approaches can be taken in cases where an auditable trail of monitoring data is unavailable or insufficient. For example, 'spot' audits concentrate on significant impacts or priority concerns about mitigation measures. These can be undertaken either as a series of 'rolling' audits or a post-project analysis. An 'impact-backwards' methodology can be used to compare EIA prediction and mitigation with environmental effects and outcomes. Impacts are verified iteratively by consultation and field checks and traced backwards to EIA practice (comparable to an effectiveness or policy audit).

Box 4: Environmental monitoring and audit of the Chek Lap Kok Airport, Hong Kong SAR

Background: A number of major projects in Hong Kong are the subject to environmental monitoring and audit (EMA) as part of EIA implementation and follow up. These programmes are carried out to ensure that the measures recommended in the EIA are actually implemented and appropriate actions are taken in cases where the impact exceeds the established limit.

Project: The Chek Lap Kok Airport was built between 1991 and 1997 at a total cost of US\$ 20 billion. It involved the reclamation of approx. 1250 ha site and facility development and related projects and infrastructure, including a new town of 20,000 (Tung Chung), and a 34 km high speed rail and road expressway to the city centre (involving fixed and tunnel water crossings and new terminal facilities on reclaimed land). Major areas of concern in site construction and operation included air quality, noise, water quality, waste and ecological damage resulting from dredging, dumping and reclamation.

EMA programme: An EMA system was instituted to follow up on the implementation of EIA measures. The monitoring component focused on aspects of particular concern, including water quality, air emissions, noise and dust levels. At the airport reclamation site, the initial water quality monitoring network was inadequate and had to be relocated to provide a more realistic set of auditing criteria. The audit component compared actual and predicted impacts, and the effectiveness of environmental instruments, such as clauses included in licenses, contract specifications and planning and land lease conditions. The programme was carried out by developing a reference manual and database, monthly and quarterly reports on compliance and performance, respectively, and policies and procedures to be followed in the event of breaches and non-compliance.

Summary of results: *The implementation of EIA measures* was largely dependent on the environmental awareness of the proponent's resident site staff, and hampered by

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the lack of legal authority of the regulatory agency. *Impact predictions* were reasonably accurate (except for cumulative effects) but there were cases where the impact exceeded the worst-case scenario (e.g. mud dumping rates). *The audit of the effectiveness of environmental instruments* concluded that not all EIA recommendations were included in contracts, many specifications were too general, and means of enforcing or inducing compliance were insufficient. An underlying issue was the variance between the project as designed and as constructed, compromising many EIA measures and requiring renegotiation of mitigation.

Key lessons: EIA documents must be prepared with the EMA requirements in mind, for example, auditable predictions and well-defined mitigation measures, with provision for their renegotiation if design and construction vary. In addition, these measures should be translated into practicable, enforceable specifications. The regulatory agency should have the necessary legal authorities for this purpose.

Source: Sanvicens 1995.

Introduce the concept of evaluation of EIA effectiveness and performance. Ask participants whether there is any experience locally with this type of review.

Ex-post evaluation of EIA effectiveness and performance can be undertaken at a number of levels. In this topic, the emphasis is on a 'before and after' review of a specific EIA process, focusing on what was achieved and which elements of approach contributed to good environmental outcomes. This type of evaluation can be undertaken as an integral component of EIA implementation and follow up, for example to identify the results and lessons of the experience and feed them back into policy action. However, examples of this approach are limited, and fewer still are based on a systematic review of surveillance, monitoring and auditing data.

Other evaluations of aspects of EIA effectiveness and performance that can provide relevant information include:

- annual or periodic reports on the implementation and performance of EIA systems, e.g. three year review of World Bank experience;
- national and comparative reviews of the quality of EIA reports, e.g. as undertaken in Australia, Canada and the USA;
- reviews of the relationship of the EIA process and decision-making; and
- post-project analyses focusing on the results of EIA inputs and activities.

Despite recent progress, however, there is a lack of widely agreed frameworks for conducting reviews of EIA effectiveness and performance in the above areas. By contrast, in the EMS cycle, review and reporting are integral procedures for improving environmental performance. In leading

companies, these are combined with monitoring, audit and other tools to address all impacts of their operations. A review of EIA effectiveness and performance can replicate this approach to document and disseminate the lessons of experience and build the knowledge base on project-specific impacts.

Briefly summarise agency responsibilities for EIA implementation and follow up activities, and note how these apply locally.

Typically, the responsibility for EIA implementation and follow up activities will be divided among different agencies and individuals. For example:

- *the competent authority* usually oversees the implementation of the terms and conditions of approval;
- *the proponent* (often through sub-contractors) normally carries out the scheduled activities, such as site clearance and preparation, construction and environmental management;
- *the environmental or regulatory agency* usually inspects mitigation measures, reviews monitoring data and verifies compliance and effectiveness; and
- *the public* can have a formal role in environmental monitoring and audit, e.g. where a stakeholder or community review committee is in place. In other cases, there may be provision for public disclosure of monitoring and audit reports and opportunities for informal review and comment.

Include a training activity to reinforce the topic (if desired).

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

Reference list

The following references have been quoted directly, adapted or used as a primary source for major parts of this topic.

Au E and Sanvicens G (1997) EIA Follow up and Monitoring in *Report of the EIA Process Strengthening Workshop* (pp. 91-107). Environment Protection Agency, Canberra.

Environment Protection Agency (1995). *Best Practice in Environmental Management in Mining. Environmental Monitoring and Performance*. Environment Protection Agency, Canberra.

Industry and Environment (1995) 18: 2&3. Special issue on environmental management tools.

Sadler B (1998) Ex Post Evaluation of the Effectiveness of Environmental Assessment (pp.30-40). In Porter A and Fittipaldi J (eds) *Environmental Methods Review: Retooling Impact Assessment for the New Century*. The Press Club, Fargo, USA.

Sanvicens G (1995) *Environmental Monitoring and Audit of the Airport Core Programme Projects in Hong Kong*. Environmental Protection Department, Hong Kong.

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

UNECE (1990) *Post Project Analysis in Environmental Impact Assessment*. United Nations, New York.

Further reading

Arts J and Noteboom S (1999) Environmental Impact Assessment Monitoring and Auditing. In Hillary R and Jolly A (eds) (2000) *The CBI Environmental Management Handbook*. Earthscan, London, UK.

Petts J (ed) *Handbook of Environmental Impact Assessment*. Vol. 2 (pp.229-251). Blackwell Science Ltd, Oxford, UK.

World Bank (1995) Environmental Auditing. *Update. Environmental Assessment Sourcebook*. World Bank, Washington, DC.

World Bank (1997) Environmental Performance Monitoring and Supervision. *Update. Environmental Assessment Sourcebook*. World Bank, Washington, DC.

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

- 11-1 Why is EIA implementation and follow up important? Do all projects need to be monitored during construction and after they have begun operation?
- 11-2 Who should be responsible for implementation and follow up activities?
- 11-3 How can decision-making agencies best link conditions of approval to the implementation and follow up of a proposal?
 - What steps and measures are necessary to ensure there is an appropriate response to unanticipated impacts and unforeseen events?
 - Is there a role for the public in these stages of the EIA process?
- 11-6 How might an EIA audit be conducted when there is no or insufficient monitoring data?

Speaker themes

- 11-1 Invite a speaker with experience in monitoring local projects to outline how the monitoring plans were developed, how often they have been adopted and how successful they have been in practice.
- 11-2 Invite an expert speaker with specific monitoring expertise of relevance to the participants to provide detailed coverage of the planning, implementation and review of monitoring programmes.
- 11-3 Invite a speaker with experience in the audit of local EIAs to address the participants, present the findings of the audit and make suggestions for the future improvement of EIAs in the area.

Group Activity 11-1: Monitoring, implementing and auditing

Title: Preparing environmental monitoring programmes

Aim: To use an EIA report as the basis for planning an environmental monitoring programme.

Group size: Four or five people, reporting to whole group at end of session.

Duration: Half-day to one day depending on the level of detail required.

Resources required:

- ☐ An EIA report for each group.
- ☐ Local case study for reference (or use Handout 11-3 if none is available locally).
- ☐ Support references such as the World Bank *Environmental Assessment Sourcebook* to provide the participants with technical and social information about the monitoring of different impacts (see reading list for details). Also search for something less technical to be representative of local monitoring.

Description of activity:

Using the EIA report each group is to:

- ☐ Plan an environmental monitoring programme noting:
 - the scope of the monitoring;
 - the objectives of monitoring the impacts;
 - how the information can be collected;
 - the boundaries of the proposed measurement and observation;
 - key indicators to be used for measurement or observation;
 - how the data can be analysed;
 - the level of accuracy required in the data;
 - how the plan can be reviewed;
 - what action is to be taken in the case of problems; and
 - who is responsible for monitoring, paying, checking (auditing).
- ☐ Present the results to the whole group.
- ☐ Finish with a discussion of the adequacy of the EIA report for supporting the production of monitoring programmes.
- ☐ Discuss how EIA reports could be improved in this regard.

Group Activity 11-2: Monitoring, implementing and auditing

Title: Reviewing an environmental monitoring programme

Aim: To critically evaluate the adequacy of a monitoring programme.

Group size: Four or five people

Duration: Half-day

Resources required :

- ☐ A copy of an environmental monitoring programme for each group member.
- ☐ The EIA report associated with the programme.
- ☐ Support references such as the World Bank *Environmental Assessment Sourcebook* to provide the participants with technical and social information about the monitoring of different impacts (see Reading list in Section A of the manual for details).

Description of activity:

- ☐ The adequacy of the monitoring programme is to be reviewed against the impacts (and their severity) highlighted in the EIA report.
- ☐ Suggestions should be made about how the programme (timing, completeness, allocation of responsibility etc) can be improved.
- ☐ The findings of the small groups should be reported to the whole group for final discussion.



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Aims of EIA implementation and follow up are to:

- carry out conditions of approval
- ensure they work effectively
- verify impacts are as predicted or permitted
- take action to manage unforeseen changes
- optimise environmental benefits
- improve EIA practice in the future.



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Key components of EIA implementation and follow up include:

- surveillance and supervision
- effects or impact monitoring
- compliance monitoring
- environmental auditing
- evaluation of EIA effectiveness and performance
- post-project analysis



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Tool box for environmental management and performance review

- Internalising the environment in policy and planning – use SEA, technology assessment, comparative risk assessment
- Planning and designing environmentally sound projects – use EIA, SIA, risk assessment, environmental benefit cost assessment
- Environmental management of the impacts of an operating facility or business enterprise – use EMS (ISO 14000 series), total quality environmental management (TQEM), industrial codes of practice



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Tool box for environmental management and performance review (cont.)

- Eco-design of processes and products – use environmental design, life cycle assessment, cleaner production
- Monitoring, audit, and evaluation of performance – use effects and compliance monitoring, site, energy, waste, health and safety audits, benchmarking, performance review, environmental auditing



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Guiding principles of EIA implementation and follow up:

- carry out conditions of approval
- undertake routine surveillance and inspection
- other activities should be commensurate with significance
- monitoring and auditing should be undertaken when
 - potential impacts are potentially significant
 - mitigation measures are untried/ outcomes uncertain
 - new aspects of EIA introduced



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Aspects to consider in design of EIA implementation and follow up:

what is required?

– identify the scope and components

who will carry out the activities?

– specify roles & responsibilities

how will these be implemented?

– allocate resources, define procedures & arrangements



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Monitoring is used to:

establish baseline conditions

measure actual impacts and trends

verify they comply with agreed conditions

facilitate impact management

determine the accuracy of impact prediction

review the effectiveness of mitigation measures



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Monitoring requirements in the EIA/EMP:

impacts to be monitored

objectives and data requirements

arrangements for conduct of monitoring

use of the information collected

response to unanticipated impacts

measures for public reporting and involvement



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For scientifically credible monitoring:

use methods of a relevant discipline

establish impact and reference sites

result in time series data which can be analysed by

– assembling the data in tabular or graphic format

– testing for variations that are statistically valid

– determining rates and directions of change



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Steps to develop an effective monitoring programme:

- define the scope and objectives (for each impact)
- identify the boundaries and select sites
- choose the key indicators
- determine the level of accuracy required in the data
- consider how the data will be analysed
- establish a data and reporting system
- specify thresholds of impact acceptability
- set requirements for action on exceedences



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Actions to address excessive impacts or unanticipated changes:

- stop or modify the causal activity
- impose penalties if legal standards are breached
- add or scale up mitigation measures (if feasible)



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EIA audits are used to:

- identify impacts and results
- verify conditions of approval are being met
- test the accuracy of impact predictions
- check the effectiveness of mitigation measures
- improve compliance and performance



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EMS audits include:

- site audits
- compliance audits
- sector & issue audits, e.g.
 - waste
 - energy
 - health and safety
 - supply chains



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Difficulties commonly experienced in EIA Audits

- limited baseline information
- qualitative and non auditable predictions
- changes to project design and mitigation
- long lead times for some types of impact

Terminologies relating to EIA follow-up

Terminologies relating to EIA follow-up**Post decision analysis**

Post decision analysis is a generic term for a wide-range of activities that can occur after a decision is made. It refers to environmental studies (ie. data collection and evaluation) undertaken during and following the implementation phases of an activity.

Environmental monitoring

Environmental monitoring refers to the systematic collection of environmental data through a series of repetitive measurements. A number of different monitoring activities are identified below:-

- *Baseline monitoring* refers to the measurement of environmental parameters during a pre-project period for the purpose of determining the nature and ranges of natural variation and to establish, where appropriate, the nature of change;
- *Effects monitoring* involves the measurement of environmental parameters during project construction and implementation so as to detect changes in these parameters which can be attributed to the project; and
- *Compliance monitoring* unlike the previous monitoring activities, takes the form of periodic sampling and/or continuous measurement of environmental parameters, levels of waste discharge or process emissions to ensure that regulatory requirements are observed and standards met. (Surveillance and inspection may also form a part of this activity but need not necessarily involve measurement of a repetitive activity).

Environmental audit

Audit is the term, taken from financial accounting, to infer the notion of verification of practice and certification of data. In terms of environmental management, the objectives of audit include:-

- the organisation and interpretation of the environmental monitoring data to establish a record of change associated with the implementation of a project or the operation of an organisation;
- the process of verification that all or selected parameters measured by an environmental monitoring programme are in compliance with regulatory requirements, internal policies and standards, and established environmental quality performance limits;
- the comparison of project impact predictions with actual impacts for the purpose of assessing the accuracy of predictions;
- the assessment of the effectiveness of the environmental management systems, practices and procedures; and
- the determination of the degree and scope of any necessary remedial or control measures in case of non-compliance or in the event that the organisation's environmental objectives are not achieved.

Two audit documents normally required are a *compliance audit*, prepared during the implementation and operation of a project; and a *post-project audit*, prepared after implementation and commissioning of a project.

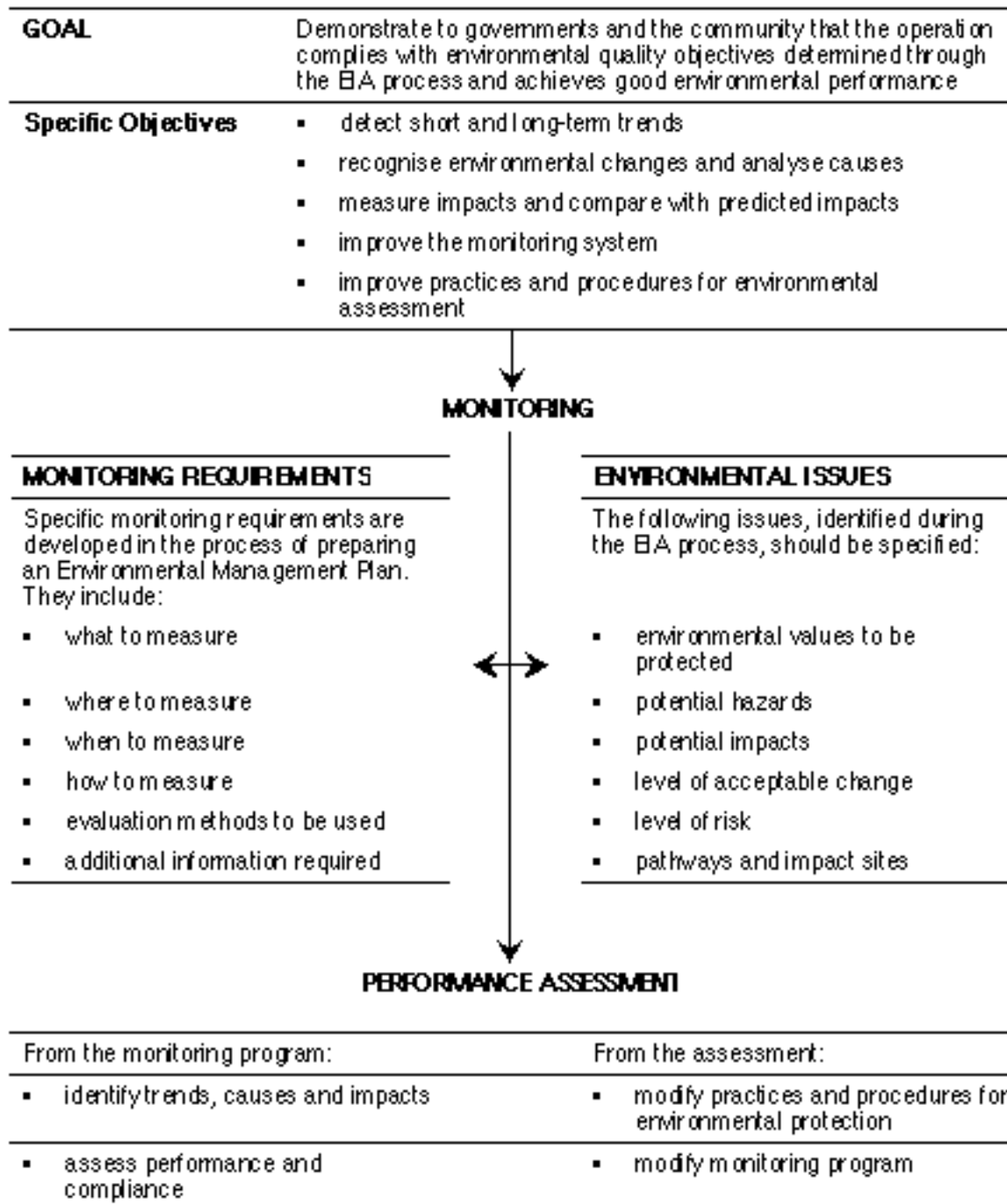
Post project analysis

This is a general term used to refer to research and supporting activities which take place after a project has been built.

Taken from Elvis Au (1995) *EIA Follow up and Monitoring*

Environmental monitoring and performance assessment

The process of environmental monitoring and performance assessment



Monitoring Case Study — ERA Ranger Mine Environmental Monitoring Program and Performance Assessment

BEST PRACTICE ENVIRONMENTAL MANAGEMENT IN MINING ' ENVIRONMENTAL MONITORING AND PERFORMANCE ' EPA JUNE 1995

Note: The Ranger Uranium mine located in the Kakadu National Park in the Northern Territory of Australia, has monitoring costs of approximately \$A 1 000 000 each year due to the sensitivities associated with uranium mining adjacent to the Kakadu wetlands.

Area	Frequency	Procedure	Analysis And Review Of Results	Compliance Requirements	Other Details
Surface water: - retention ponds - creeks - billabongs - sumps - wetland filters	weekly* monthly* monthly* monthly* as required for research purposes. * daily & weekly during a release	Water samples taken and chemistry analyses completed. Water levels checked via gauge boards and stream gauging.	Results graphed and tabulated for inclusion in reports. Comparisons made with previous reporting period. Collated in quarterly/six monthly water management and annual environmental reports.	Limits established for receiving waters during release of water from retention ponds.	Hydrology and chemistry combined for load calculations during release. Results used in research on wetland filtration, seepage management etc.
Groundwater: - monitoring bores - piezometers - dewatering bores - land application bores	monthly bi-monthly six-monthly some more frequently weekly during irrigation.	Water level in bores measured using dip-meter and piezometer level read. Water samples taken using bore pump.	As above.	Tailings bores and piezometers needed to monitor stability and seepage aspects of tailings dam. Land application (Irrigation) area monitored for mobility of salts and other elements.	Data included in research projects on seepage modelling.
Biological screening: - retention ponds - creeks - billabongs - wetland filter	During wet season prior to and during release of retention pond water. As required for wetland filter research.	Control water obtained from creek. Pond water at a range of dilutions prepared and microscopic aquatic organisms (hydra, cladoceran and fish embryos) used to assess toxicity.	Results tabulated, statistically analysed and included in reports. Internal and external review by government authorities.	Used as part of process to determine dilution rate of release water.	Government standards and safety factor (x10 to x100) before applying the results of toxicity tests.
Soils	Three-yearly.	Collection, preparation, digestion and analysis according to standard methods.	Reported three-yearly and in annual report.	Results compared to historical data.	Monitoring sites are located along drainage channels around the lease area.

Monitoring Case Study — ERA Ranger Mine Environmental Monitoring Program and Performance Assessment

Area	Frequency	Procedure	Analysis And Review Of Results	Compliance Requirements	Other Details
Uptake of contaminants by biota: • mussels in creeks • vegetation in land application area.	Annually and on non-regular occasions (eg. for retention pond 2 release).	Mussels sampled from down-stream billabong. Mussel tissue ashed and analysed for contaminant uptake. Vegetation sampled and analysed for contaminant uptake.	Internal and external review by government authorities in the annual report.	Results compared to previous data. Also judged on relevant ANZECC standards for edible criteria.	
Sediment control	Annual.	Annual erosion survey undertaken and wet season plan prepared for remediation.	Written report/photos, recommendations and budget requirements. Internal review.	Minimise soil loss from mine area and surrounding lease due to disturbance.	Comprehensive pond systems ensures runoff contained in ponds/sediment control structures prior to overflow to creek system.
Weeds	Bi-annual.	Visual inspection to assess success of previous weed control efforts and plan future control of these areas or new outbreaks.	Sketch map prepared and weed control methods planned in liaison with government authorities (Department of Primary Industry & Fisheries) and neighbours in National Park (Australian Nature Conservation Agency). Mission grass main weed problem. Internal review and reporting.	N/A	Encourage use of native species by residents in gardens in Jabiru township via education and supply of plants from Ranger nursery during establishment of town.
Fire	As required.	Control of wildfires during dry season and planned burns conducted late wet season/early dry season.	Research on fires helping to refine timing and nature of burn. Internal review and external review during research field days on site.	N/A	Protection of mine assets and monitoring equipment in surrounding woodland, a key requirement for fire monitoring/management.
Area dust and personal dust	Weekly Daily dependent on level of dust found.	High volume dust samplers and personal samplers are used to collect the sample on a filter paper. Radiometric and gravimetric analyses are undertaken.	Results are reported on a quarterly and annual basis. On an annual basis the results are compared with the previous period results.	Results are compared with the allowable limits as per the Authorisation to Operate.	The results from the personal air sampling and the consequent radiological analysis are used to assess radiation exposure due to inhalation of radioactive particles.

Monitoring Case Study — ERA Ranger Mine Environmental Monitoring Program and Performance Assessment

Area	Frequency	Procedure	Analysis And Review Of Results	Compliance Requirements	Other Details
Stack emissions	Emissions are measured from the calciner and product packing stacks. Calciner and product packing: monthly. Acid plant: Sulphur dioxide and acid mist emissions are measured from the acid plant stack every three months.	The USA EPA methods for stationary sources are used. A representative sample over a four-hour period is collected from each stack.	Results are reported on a quarterly and annual basis. On an annual basis the results are compared with the previous period results.	Results are compared with the allowable limits as per the Authorisation to Operate.	The results are used as inputs for some atmospheric modelling work.
Radon-222 Progeny Exposure	Weekly and monthly depending on areas monitored.	Automatic area monitors are used to measure average concentrations of ambient radon progeny (decay product of Radon-222 gas). Samples are collected in the immediate operations area and the surrounding environment. Areas are usually monitored for a minimum of 24 hours and up to seven days continuously. Average concentrations are measured every hour at various locations.	Results are reported on a quarterly and annual basis. On an annual basis the results are compared with the previous period results.	Results are compared with the allowable limits as per the Authorisation to Operate.	Results from area measurements of radon progeny concentrations are used to calculate employees' radiation dose due to the inhalation of radon progeny.
Gamma Exposure	Personal monitors are used to measure individual employee exposure to gamma radiation. These are worn every day by employees working in the process plant. The monitors are analysed on a quarterly basis.	Worn by employees who are likely to receive the highest exposure to gamma radiation, eg employees who work in the process plant and the mine.	Results are reported on a quarterly and annual basis. On an annual basis the results are compared with the previous period results.	Results are compared with the allowable limits as per the Authorisation to Operate.	The monitors are analysed by the Australian Radiation Laboratory and the results combined with the radiation doses from dust and radon progeny to get the total radiation dose to individual employees.
Blasting	Every blast (daily for six months of the year)	A blast vibration monitor is located adjacent to the pit on the southern side to measure the magnitude of each blast.	Chart records from the monitoring device are forwarded to the supervising authority monthly.	All blasting operations shall be conducted so that Mt Brockman and the aboriginal sacred sites in the environs are not damaged.	Mine blasting operations have taken place within the limits set for ground vibration magnitude.

Monitoring Case Study — ERA Ranger Mine Environmental Monitoring Program and Performance Assessment

Area	Frequency	Procedure	Analysis And Review Of Results	Compliance Requirements	Other Details
Ore and waste dumping (Restricted Release Zone - RRZ)	Daily during mining phase.	Grade control prior to blasting plus discriminator reading of each truck load for uranium content. Scintillometer measurements over surface of waste and ore stockpiles are made to check only <0.02% uranium is on waste stockpile (outside RRZ boundary).	Grade control plus discriminator records plus calibration. Notebook records of surface checks of radioactivity.	All material with >0.02% uranium must be contained in RRZ for water management purposes.	

Topic 12

EIA project management

Introduction

Checklist

Session outline

Reference list and further reading

Training activities

Support materials

Topic 12—EIA project management

Objective

To outline the importance of EIA project management and the roles and responsibilities of those who undertake it.

To understand the skills and knowledge needed to successfully carry out these functions.

Relevance

EIA project management is complex and demanding. It requires a combination of specialist and managerial skills, and commitment to the task. Not all practitioners are suited to the role of Project Manager, nor can the work be done in isolation. All practitioners, however, require an understanding of what EIA project management entails and how different roles, responsibilities and interests are addressed and accommodated.

Timing

Three 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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management



Information checklist

Obtain or develop the following materials, as appropriate:

- ☐ examples of EIA schedules and budgets for local projects;
- ☐ examples of the composition and management of teams that have prepared EIA reports for local projects;
- ☐ contact names and telephone numbers of people, agencies and organisations, and environmental information/data resource centres able to provide assistance in relation to the management of EIAs; and
- ☐ other resources that may be available, such as course materials on project management techniques, videos, journal articles, computer programmes, and case studies.

Session outline

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 they are important.

This topic explores the importance of EIA project management and the different roles and responsibilities that might be undertaken. It outlines the skills and knowledge a person might need to successfully carry out these functions.

Introduce the concept of EIA project management and the importance of its role in the EIA process.

The main purpose of EIA project management is to plan, organise and coordinate the tasks necessary to carry out each phase of the EIA process effectively. An immediate objective is to produce an EIA report that communicates the information necessary for sound decision-making (see Topic 8 – *Reporting*). The ultimate objective is to ensure the EIA process results in the environmental benefits expected, notably through actions to avoid, reduce and offset the adverse impact of the project.

EIA project management encompasses a number of functions. These include giving direction and backing to the team responsible for carrying out EIA studies and activities; liaising with the project engineer, site manager and others responsible for project design, construction and operation; and consulting with the responsible authority, regulatory body and other key EIA stakeholders, including the public and affected communities. The EIA Project Manager needs to understand, take account of and mediate among their varying interests needs and demands. All of this must be accommodated within the time and budgetary constraints under which EIAs are typically undertaken.



12-1

Using Handout 12-1, the OECD/DAC *Comprehensive Checklist for Managing Environmental Assessment of Development Assistance Projects*, work through the range of tasks for which the EIA project manager may be responsible. Encourage the participants to develop a list of attributes they feel describe a good Project Manager. Explore why these are important

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management**



1

To function effectively, the EIA team needs strong leadership and support from the Manager. All team members should have a clear understanding of what is to be achieved, what the deadlines are, how money and resources will be allocated, who does what, who reports to whom and how issues will be resolved.

A good Project Manager will be someone with the following attributes:

- good communication skills;
- solid technical competency;
- problem-solving approach;
- leadership abilities;
- flexibility and willingness to learn from others;
- able to negotiate and settle disputes; and
- proficiency in planning and budgeting.

Good communication

Communication skills are critical for an EIA Project Manager. He or she is the interface between the EIA team and the proponent's staff and contractors. Additionally, the EIA Project Manager will likely be responsible for maintaining external contacts with the competent agencies, regulatory bodies, other relevant authorities, non-governmental organisations and members of the public.

Technical competence

A successful EIA Project Manager will have a sound understanding of the technical aspects and the environmental and social impacts of the project. The appointment of an experienced EIA practitioner is usually necessary to get the best out of an interdisciplinary team.

Problem-solving

EIA Project Managers need to be able to tackle problems and turn them around quickly as deadlines are often very tight. They also need to move expeditiously to meet the EIA terms of reference, fine tuning aspects as the situation requires. Excessive caution in the early stages delays the time for this sort of correction.

Leadership abilities

To command the respect of the team, the EIA Project Manager must exercise leadership. This means having a clear idea of what is to be done and how the tasks are to be carried out. Good interpersonal skills are needed to

motivate team members, allied with qualities of integrity and sound judgement.

Flexibility and willingness to learn

The EIA Project Manager is likely to be a generalist rather than a specialist. He or she needs to know enough about each of the specialisations of the team to ask the right questions and test the advice that is given. Additionally, the Project Manager must be flexible, respecting the credentials and professional judgements of others and be open to learning from them.

Able to negotiate and reconcile disputes

It is the EIA Project Manager's job to get the best out of team members, and to negotiate compromises when there are disagreements of interpretation. Additionally, he or she will also need to negotiate with the proponent, project design and construction teams, government agencies and stakeholders. For example, EIA studies may indicate a project has a more significant impact than was first identified and the Project Manager must then negotiate with the proponent for additional resources.

Proficiency in planning and budgeting

The EIA process is invariably undertaken within strict time and budgetary constraints. It also involves accommodating new information and changing requirements within an EIA process that is in lockstep with a schedule for project development. Making these adjustments demands planning and budgetary competencies.

Outline the typical role of the EIA Project Manager. Ask the participants if there are other roles that they have encountered.

The EIA Project Manager, as the team leader, needs considerable interpersonal skills. A major part of the job involves: understanding the larger context of the EIA study; team building and facilitation of key tasks; asking the right questions to keep work on track; and maintaining quality control. These functions also involve making hard management decisions, often in the face of risk and with limited information.

The technical aspects of EIA project management are also demanding. The conduct of EIA studies requires the Manager to have a rounded understanding of the impacts being analysed, sufficient to ensure direction and quality control of the technical content. The preparation of the EIA report requires the integration and synthesis of study findings into a coherent overall statement of the environmental impacts and consequences

of a proposal. This task falls primarily on the shoulders of the EIA Project Manager.

In part, the role of the EIA Project Manager will depend on whom he or she works for. There are, however, certain core tasks, including:

- understanding the issues involved and the affected environment;
- defining tasks and developing an appropriate work programme;
- setting time lines for delivery;
- estimating and managing a budget;
- establishing an organisational structure;
- putting together an interdisciplinary EIA team;
- establishing standards and maintaining quality of work;
- managing and co-ordinating the information generated by the study; and
- preparing the EIA report to comply with the terms of reference.

Outline why an interdisciplinary EIA team is required and what it entails.

Most proposals have a number of potential impacts, notably including physical, chemical, biological, social, cultural and economic impacts. The EIA team will need to bring together multiple viewpoints and expertise in order to produce a reasoned statement of the overall impact. The selection of appropriate team members is a key task of the EIA Project Manager.

An interdisciplinary team consists of a group of people, trained in different fields, who interact to produce a coordinated EIA report. This approach can be contrasted with a team made up of experts, who pursue their lines of inquiry relatively separately and do not have a common understanding of the impact of the proposal. In this case, the EIA Project Manager has the primary task of drawing together the findings. Often, the lack of an interdisciplinary approach results in an EIA report that lacks real synthesis, containing a number of specialist studies with little cross-referencing.

Members of an interdisciplinary team will be chosen for their complementary perspectives and technical expertise in analysing the environmental and social impacts that are of concern. Experience in EIA, as well as disciplinary competence, will be a factor influencing selection. When determining the composition of the team, the EIA Project Manager will have to choose the level of expertise that is warranted in the circumstances, for example, whether to engage a general ecologist for the term of the study or a number of specialists to undertake specific components.

In practice, the choice of EIA team members will be limited by who is available and what can be afforded. Teams can range in size from two or



2



3



4

three to up to thirty members, depending on the complexity of the proposal. In developing countries, even large proposals may have only a few specialised staff allocated to the EIA, although small teams are not necessarily less effective or efficient. They can promote continuity, and encourage better communication and greater individual responsibility for the success of the EIA.

In summary, factors that can affect the selection of team members include:

- available finances;
- range of impacts to be studied;
- demonstrated expertise and experience ;
- local knowledge; and
- ability to work with others and contribute to team efforts.

Establishing a team does not in itself guarantee that the EIA will be interdisciplinary. It is the role of the EIA Project Manager to structure opportunities for the team to work together. Often, an initial site visit is a first, important means of bringing together team members to learn about the scope of the EIA study. Other meetings can be used to review the direction, progress and results of the work and to develop an integrated approach to writing the EIA report.

The EIA Project Manager will be responsible for keeping open the lines of communication with the stakeholders, and for addressing conflicts and differences. Conflict within the team can be either because of disagreement about scientific interpretation, or because members do not get on with each other. The proponent can disagree with the EIA team about the significance of key impacts, or, worse still, want to alter the EIA report. Other stakeholders may attempt to push their own interests by disagreeing with the basis of study findings, reflecting different objectives or values from those of the EIA team and/or proponent.

Some of these conflicts can be avoided or contained by effective communication and the provision of timely information. Other conflicts within the EIA team and with the proponent will test the negotiation skills of the Project Manager, and call for a combination of diplomacy, mediation and dispute settlement. Even so, it will not be possible to satisfy all of the parties all of the time.

Ask the participants to identify appropriate attributes of members of an EIA interdisciplinary team.



5

A member of a successful interdisciplinary EIA team should have:

- interpersonal skills;
- creativity;
- adaptability;

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- good oral and written communication skills;
- organisational capability;
- the ability to listen and to assimilate information;
- a sense of humour; and
- patience.

Introduce the concept of project control through scheduling. Outline the use of bar charts and critical path methods and ask the participants to suggest any deficiencies these may have. Show participants examples of a schedule (if available) for a local project.



6

The EIA Project Manager is responsible for scheduling how the EIA study will be organised into component activities and how these will fit together. This is a crucial control mechanism, which involves:

- identifying key events and dates for completion of the component activities;
- allocating the resources required to complete each of these activities;
- estimating the time required to complete each of these activities; and
- estimating the cash flow.

Both simple and complex methods of scheduling are available. Their use will depend upon the complexity of the EIA process in relation to project development. Often, simple flow and bar charts will suffice. In other cases, more powerful methods of scheduling will be warranted, such as critical path methods (CPM) of which PERT is commonly used for controlling engineering projects. These methods use network logic to construct a logical sequence of tasks necessary to complete the EIA as shown in the figure below.



7

A project schedule can then be produced (using project management software) as shown in the accompanying calendar bar or Gantt chart. This chart sets out:

- the activities to be performed;
- the time period to undertake and complete them;
- the events that begin and end each activity; and
- the relationship between the activities, recognising that some can be undertaken concurrently but others are dependent on the completion of other tasks.

Critical tasks are ones, which if they overrun, lengthen the time taken to complete the EIA project. These tasks and the links between them are known as the critical path, and they have to be managed with particular care. EIA project managers will be alert to study dependencies, for example where the prediction of ecological impact is dependent on results from a habitat

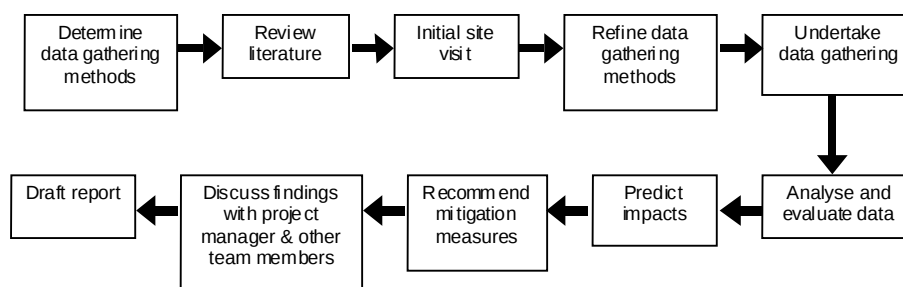
survey. It is their task to anticipate these contingencies, build them into the project schedule, and take corrective actions as necessary to meet critical deadlines.

Use of project scheduling software makes it easy to determine the revised time scales. In the example given below, certain adjustments can be made to the relationship of the various tasks. For example:

- It is not necessary to undertake the initial site visit after completion of the literature review, but it is important for the site visit to have been undertaken by the time the literature review is complete (this is a finish to finish relationship).
- Drafting of the report can commence once the literature review is complete, but cannot be completed until all other tasks are complete.

In this example the project would begin on 2 June 2002 and would be complete on 22 July 2002. The duration of each task is given in days in the third column from the right and is represented by the horizontal bars. The relationship between the tasks is illustrated by the arrows which connect the bars.

Example of a simple flow chart



Example of a project schedule bar chart



8

Introduce and outline the role of budgeting as one of the primary tasks of the Project Manager.

The most difficult part of budgeting is the initial estimate of the funding required. EIA Project Managers first identify the most important issues and how they are related to each other. An estimate then can be made of the cost of the studies needed, the people to undertake them, the time required to carry them out, the services and equipment required to support the team and the overheads.

A budget should take account of costs from all possible sources and allow for unexpected problems. Items of expenditure can include:

- employed and contracted labour;
- overheads;
- travel and travel allowances;
- vehicle purchase, running and maintenance costs;
- communications;
- computer hardware and software;
- equipment; and
- document production and duplication.

When preparing an EIA budget, staff costs will be the primary item. Overhead and other costs (e.g. report production and communications) may be calculated by applying a multiplier to the labour costs, as shown in the example below. Usually, the multiplier is between two and three times the labour cost, depending on the profit margin. Other costs should be added separately to the budget. Capital expenditures or contract services may be high for certain projects or aspects (e.g. a contaminated land survey).

EIA Project Managers often must fight hard for an adequate budget, sufficient to address the significant impacts of a proposal. Alternatively, they may have to make corresponding cuts to the scope, desired accuracy or technical breadth of the planned assessment while still maintaining its quality and integrity. Tight control must be exercised to prevent overruns, for example by establishing reporting systems that track expenses and progress against the budget. Of course, not everything will go to schedule and if study components have to be changed it is good policy to put this in writing.



9

Sample of part of budget preparation



10

Expertise required	Rate of pay (\$ per hour) (a)	Estimated duration of work (hours) (b)	Overhead multiplier (c)	Total (a)x(b)x(c) \$
Noise impact				
1. Investigation				
senior	60	5	2.5	750
junior	15	20	2.5	750
2. Analytical				
senior	60	6	2.5	900
junior	15	40	2.5	1500
3. Reporting				
senior				
junior				
Social impact				
1. Investigation				
Principal				
Senior				
Junior				
2. Analytical				
3. Reporting				

Source: Bingham (1994)

Briefly outline the Project Manager's responsibilities in preparing the EIA report (this is covered more fully in Topic 8-Reporting). Ask the participants to add to the discussion based on their own experience.

The EIA report is a primary document for decision-making, and for informing stakeholders about likely environmental impacts of a proposal and the measures for mitigating them. EIA reports must be written to an appropriate technical standard, in compliance with the terms of reference and in an easy-to-understand style. They also must be carefully edited, designed and produced. Money should be allocated in the budget for these purposes, and for distribution. Experienced EIA Project Managers recognise that often more copies of the report will be printed than is normally budgeted for, particularly if the proposal is controversial.

An early start to writing the EIA report can be a good idea. However, it is important to avoid too detailed and elaborate descriptions of the existing environment (see Topic 8 –Reporting). This material is available early and the temptation is to give it more emphasis than it deserves. The EIA report is intended to be a statement of impact, and this information should comprise

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the main body of the text. Equally important is the executive summary of the relevant findings; this is the part of the report which most people read.

The EIA report will find many critics, and any inaccuracies will make it more open to challenge. It is the responsibility of the EIA Project Manager to provide overall quality control, checking each detail of the report for consistency and accuracy. Proponents may be tempted to either ignore or hide material they feel is detrimental to the project. This can be highly contentious and the best defence is for the EIA Project Manager to point out that omissions often raise much greater opposition and can contribute to delaying or even stopping the proposal.

Little is achieved if the findings of final report are not successfully communicated. It is necessary to avoid misleading or ambiguous terms, which can be interpreted in different ways. Clear definitions should be given for terms such as significant, severe, moderate or negligible impact, remembering the many audiences of the EIA Report. Not all readers will be familiar with project details and impact magnitudes may need to be translated into recognisable quantities. For example, it may be helpful to state the transport of the millions of cubic meters of earth and rock to build a dam in terms of the number and frequency of truck loads needed during construction.

Often, the final period of report editing and production is a crisis time for the EIA Project Manager and the team. It can be helpful to have a competent outsider review the report for consistency, accuracy and completeness before it is reproduced and distributed. Remember, too, most reports will go through a quality check as part of the EIA process, and it is helpful to replicate this internally to anticipate the findings of an 'official' review.

Briefly reinforce the capacity building aspects of the role of the project manager.

Before the EIA team disbands, it can be useful to have a 'post mortem' of performance during the project. The lessons learned can be used to improve the next EIA (see Topic 11 – *EIA implementation and follow up*). Wherever possible, the EIA Project Manager should make arrangements to dispose of any equipment that has been acquired, and to catalogue and store data, reference materials and contact lists for use in future assessments. This information is likely to be particularly important in developing countries, where EIA experience may be limited and resources are scarce.

Include a training activity to reinforce the topic (if desired).

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

Reference list

The following references have been quoted directly, adapted or used as a primary source for major parts of this topic.

Burack D A (1992) Better Management: The Key to Successful Environmental Impact Assessment (EIA). *12th Annual Meeting and International Congress of the International Association for Impact Assessment*. Washington, D.C.

Bingham C S (1994) EIA and Project Management - A Process of Communication. *15th International Seminar on Environmental Assessment and Management*. University of Aberdeen, Scotland.

Canter L (1996) *Environmental Impact Assessment*. McGraw Hill, New York,. (specifically at Chapter 2: Planning and Management of Impact Studies, pp.36-55).

OECD/DAC (1994) *Towards Coherence in Environmental Assessment. Results of the project on Coherence of Environment Assessment for International Bilateral Aid*. Vol. 2. Canadian International Development Agency, Ottawa.

World Bank (1996) The Challenges of Managing the EIA Process. *Environmental Assessment Sourcebook Update*, November 16, Environment Department, The World Bank, Washington D.C.

Further reading

Canter L (1991) Interdisciplinary Teams in Environmental Impact Assessment. *Environmental Impact Assessment Review* 11:4, 375-387.

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

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

- 12-1 Would the role of the EIA Project Manager in this country differ significantly from the one outlined in the topic presentation? What aspects would differ? What are the implications of these differences for the EIA process?
 - 12-2 What advantages does using an interdisciplinary team approach bring to EIA?
 - 12-3 What process could be used to select the members of an interdisciplinary team? Where might the required expertise be found?
 - 12-4 How could the work of an interdisciplinary EIA team be monitored?
 - 12-5 What measures can be put in place to ensure that an EIA team is managed in an interdisciplinary manner?
 - 12-6 Imagine that you are managing an interdisciplinary EIA team and need to select a consultant to be responsible for creating and implementing the public involvement strategy. Which credentials of those consultants applying for the position would be the most important to you in deciding which one to engage?
-

Speaker themes

- 12-1 Arrange for a speaker with experience of managing an EIA team on a local project to discuss its composition and organisation. What types of expertise did the team members have? How was the team organised to interact in an interdisciplinary manner? What could have been done to improve the management of the team?
 - 12-2 Arrange for a speaker with experience of managing an EIA team on a local project to discuss how the EIA study was conducted. What were the key tasks and activities? What were the main issues encountered? How was the EIA report drafted
-

Group Activity 12–1: EIA project management

Title: Project scheduling

Aim: To understand the process of task identification, preparing a project schedule and budgeting.

Group size: Four to six people

Duration: Half-day to one day

Resources required

- ☐ Case study containing preliminary EIA information.
- ☐ Handout 12–1

Description of activity:

Using a case study:

- ☐ identify the major steps in the EIA;
 - ☐ identify the major tasks to be undertaken in managing, conducting and writing the EIA;
 - ☐ construct a bar chart to show how the EIA could be scheduled;
 - ☐ identify the manpower resources required to perform these tasks;
 - ☐ estimate the time commitment required by each project member, including meetings, public consultation and review of documentation;
 - ☐ prepare a budget for the EIA using hourly rates; and
 - ☐ estimate other expenses such as travel and EIA Report production costs.
-

Group Activity 12–2: EIA project management

Title: Establishing an interdisciplinary EIA team

Aim: To understand how to select an interdisciplinary EIA team, using local consultancies.

Group size: Small group activity followed by a large group summing up.

Duration: Half-day

Resources required:

- ☐ Description of a project
- ☐ Brief terms of reference
- ☐ Three proposals (real or invented) from local consultancies to carry out the work.

Description of activity:

Using the terms of reference and project description:

- ☐ develop a set of criteria that could be used to choose between consultancies that tender for the work;
 - ☐ review the three proposals and use the criteria to select the team that has the best credentials to undertake an interdisciplinary EIA, cost-effectively; and
 - ☐ in the whole group discuss how successful the decision criteria were and what issues must be addressed in putting together an interdisciplinary EIA team locally.
-



1

Attributes of a good EIA Project Manager:

- good communicator
- technical competency
- problem-solver
- team leader
- flexibility and willingness to learn
- able to negotiate
- planning and budgeting proficiency



2

Core tasks of EIA project management

- understand the issues
- define tasks and work programmes
- set timelines for delivery
- estimate and manage the budget
- establish an organisational structure
- put together the EIA team
- establish and maintain work standards
- manage information flow
- prepare the EIA report



3

Key characteristics of an interdisciplinary EIA team:

- complementary perspectives and expertise
- interact together
- undertake an integrated approach
- common understanding of key impacts
- prepare a synthesis report



4

Factors influencing selection of EIA team:

- finances available
- range of impacts to be studied
- expertise and experience
- local knowledge
- ability to work with others



5

Attributes of interdisciplinary team members:

- interpersonal skills
- creativity
- adaptability
- communication skills
- organisational aptitude
- listening skills
- sense of humour
- patience



6

Steps in EIA project scheduling

- identify key events
- break down project into stages
- estimate timing of stages
- identify resources required
- estimate cash flow



7

A calendar bar or Gantt chart sets out:

- activities to be performed
- timelines for completion
- events that begin and end each activity
- links between the activities
- the critical path



8

Example of project schedule bar chart





9

Items in an EIA budget include:

- labour costs
- overheads
- travel expenses
- capital expenditures
- communication and report production costs



10

Sample of part of budget preparation

Expertise required	Rate of pay (\$ per hour) (a)	Estimated duration of work (hours) (b)	Overhead multiplier (c)	Total (a)x(b)x(c) \$
Noise impact				
1. Investigation				
senior	60	5	2.5	750
junior	15	20	2.5	750
2. Analytical				
senior	60	6	2.5	900
junior	15	40	2.5	1500
3. Reporting				
senior				
junior				
Social impact				
1. Investigation				
Principal				
Senior				
Junior				
2. Analytical				
3. Reporting				

Source: Bingham (1994)

COMPREHENSIVE CHECKLIST FOR MANAGING ENVIRONMENTAL ASSESSMENT OF DEVELOPMENT ASSISTANCE PROJECTS

OECD/DAC (1994) Towards Coherence in Environmental Assessment
(Organized according to the stages in a generalized project cycle)

ASPECTS OF ASSESSMENT	MANAGEMENT ACTIVITIES	EXPLANATORY NOTES
<i>PROJECT IDENTIFICATION STAGE</i>		
Communications	Ensure that potential partners are asked to cooperate in the proposed activity as early as possible in the planning process, particularly before environmental screening occurs.	- This refers to the implementing organization in the recipient country as well as to other donors. - Experience shows early cooperation to be critical to be a successful assessment and project support.
	Establish the time period over which the partners prefer to be involved in the assessment process, particularly in regard to post-completion monitoring and evaluation functions.	- Completion of assessment report often marks the end of collaboration in the assessment process. - There could be prior agreement to collaborate in a mid-term review and/or in project evaluation.
	Maintain and circulate a current list of contact persons in the participating donor agencies and the implementing organization within the recipient country.	- Failure to maintain appropriate contacts can lead to loss of "corporate memory". - Contact persons can change for assessments which extend over a considerable period of time.
	Establish mechanisms whereby officials in the donor agencies and the implementing organization within the recipient country can discuss and jointly plan assessment matters in a timely and effective manner.	Following the OECD/DAC Good Practices, the recipient country should be encouraged and supported to take the lead, with the involvement of the affected public, in designing, implementing and evaluating the environmental assessment.
Policy Check	Assess the proposed project against the legal requirements, policy objectives and operational priorities of the donor agencies and the recipient country.	- These may be difficult to determine for the recipient country. - It should be determined whether the project has been rejected by any other donors.
	In consultation with recipient country officials, consider the proposed project within the context of national or regional environmental action plans, conservation strategies and state-of-the-environment reports.	- This can include strategic, programmatic or sectoral assessments previously completed by other aid institutions. - OECD/DAC has published Good Practices for Country Environmental Surveys and Strategies.
	Assess the proposed project against the provisions of international agreements to which any of the parties are signatories.	There are now over 870 bilateral and multilateral international legal instruments that have environmental provisions.
Screening	Ensure that projects are screened for potential environmental impacts in a manner which meets the procedural requirements of the donors and the recipient country.	- Screening is a common occurrence and is required under the OECD/DAC Good Practices. - Not all DAC Members use screening categories; refer to country summary sheets in Volume III.
	Establish procedures for resolving differences in the results of environmental screening, should such occur, in a manner acceptable to all of the parties involved.	- Variation in criteria and procedures can lead to different screening decisions for the same project. - Differences in screening decisions can lead to disagreement on the level of assessment required.

FEASIBILITY STUDY STAGE

Level of Assessment	Ensure that, if screening determines that further assessment is required, the parties agree on the need for a "limited" or "full" assessment.	The basic steps are the same for limited or full assessment - only the perceived severity of the impacts and the level of analysis is different.
Alternatives	Ensure early consideration of alternatives to the proposed project at the strategic level, i.e., those (i) involving national policy decisions, (ii) having broad-scale socio-economic implications or (iii) impacting on the achievement of long-term sustainable development (includes consideration of the "no go option").	- All parties may not agree on the need to consider alternatives at the strategic level. - Examples include alternative energy sources, transportation modes and agricultural practices. - The need to consider technical alternatives (sites, designs and operating systems) is normally part of the terms of reference for an assessment.
Scoping	Secure agreement from the donors and representatives of the recipient country government on the need for, and objectives of, a scoping process.	OECD/DAC Good Practices refers to scoping as a process to identify (i) significant environmental issues, (ii) the nature of required analysis and (iii) possible mitigation measures.
	Ensure agreement among all parties on the process of public participation to be followed in the scoping process, including (i) defining "the public", (ii) assigning roles and responsibilities for the process, (iii) informing and contacting affected and interested groups, (iv) recording and analyzing the inputs and (v) distributing results.	- OECD/DAC Good Practices call for the "gathering of data, concerns and expertise" from officials, experts, concerns and expertise" from officials, experts, affected groups and NGOs. - Public participation in developing countries is a sensitive and complex undertaking for which the recipient country must assume responsibility, with support from the donors.
Terms of Reference	Ensure the development of a single terms of reference acceptable to all parties that defines the administrative, procedural, technical and decision-making requirements for the assessment.	- The quality of an environmental assessment will reflect the quality of the terms of reference. - Refer to the Framework Terms of Reference which accompanies this Checklist.
	Determine the roles and responsibilities of the parties in regard to the management and conduct of the environmental assessment.	OECD/DAC Good Practices encourage recipient countries to take responsibility for their own environmental assessments, with donor support.
	Ensure agreement on procedures for identifying, collecting and storing the required information and data in the recipient country, and for sharing that information and data among the parties.	- Collecting information and data can be one of the most costly aspects of environmental assessment. - Significant savings in cost and time can be achieved through greater sharing of information.
	Take whatever measures are appropriate to maximize the institutional and technical capacity of the recipient country for managing the environmental assessment.	Capacity building and institutional development in recipient countries is a priority topic for DAC Member countries and improving environmental assessment capability is an important component.
	Ensure procedures for reviewing progress in the environmental assessment, and for reviewing, publishing and distributing the final assessment report in donor and recipient countries.	- Quality control assurance is an important aspect of conducting an environmental assessment. - External review and distribution of assessment reports can be a sensitive issue in some countries.

APPRAISAL STAGE

Project Decision	Ensure that the donors and the recipient country agree on procedures to be followed after the completion of the environmental assessment for arriving at a final decision concerning the acceptance or rejection of the environmental effects of the proposed project. Ensure that the donors and the recipient country have come to an agreement on the environmental standards to be applied to the project.	• OECD Council Recommendation of 1989 provides guidance for high-level decision-makers. • Parties may agree to a collaborative assessment, but they make independent project decisions. • Some donors set time limits from the completion of the assessment to final project decisions. • Donors may reserve the right to have their own standards apply if those of the recipient country are considered unacceptable or not enforceable.
Recommendations	Ensure that recommendations on environmental management plans, mitigation plans, compensation schemes and monitoring programmes are incorporated into project approval documents.	• OECD/DAC has Guidelines for Aid Agencies on Involuntary Displacement and Resettlement. • Financial compensation and replacement of lost land can be politically sensitive issues.
Responsibilities	Ensure clear allocation of responsibilities for the implementation of all recommended actions contained in the environmental assessment report.	• Following OECD/DAC Good Practices, recipient countries should be encouraged and supported to take as much responsibility as possible.

FINAL DESIGN AND IMPLEMENTATION STAGE

Mitigation	Establish procedures to ensure that recommendations on mitigation, monitoring, relocation and compensation are carried out during project design and construction (compliance audit).	• Site monitoring is normally the responsibility of the implementing organisation with the recipient country, with occasional checks by donor resident professionals or consultants.
Reporting	Ensure that reports on the implementation of assessment recommendations are generated on a regular basis and distributed among the parties.	• Careful monitoring of progress at this stage will help to avoid difficult problems in the operational phase of the project.

OPERATIONAL STAGE

Monitoring	Ensure that regular environmental monitoring is conducted in accordance with the recommended monitoring programme, and that procedures are agreed upon in the event that limits are exceeded. Ensure that monitoring records are maintained and verified, and distributed to the participating donors and interested members of the public within the recipient country.	• Objectives are to ensure compliance with standards and to determine success of mitigation. • Monitoring is usually the responsibility of the recipient country with occasional checks by donor. • It may be difficult in some countries to have monitoring equipment maintained and calibrated. • Distribution of monitoring results may be a sensitive issue in some situations.
Mid-term Review	Determine the parties to be involved in a mid-term environmental review, the terms of reference for the review and to whom the results will be distributed.	• Most donor agencies undertake a mid-term review after the project has been in operation for a sufficient period of time for major environmental and social problems to become evident.

MONITORING AND EVALUATION STAGE

Monitoring	Ensure that the recommended environmental monitoring programme has been implemented, determine if it needs to be modified in light of experience, and whether the results are serving a useful purpose.	- Monitoring is costly and time consuming and may become a pro forma exercise. - Experience may show that some variables no longer need to be monitored or that there is no feedback from monitoring to project operations.
Evaluation	Determine which of the parties are interested in participating in an environmental evaluation of the project, when that might occur, and how they might cooperate given that such evaluations are normally undertaken by specialised evaluation units or external independent bodies. Ensure agreement on the scope of the evaluation, i.e., whether or not it will be confined to the original terms of reference. Ensure agreement on the publication and distribution of the evaluation reports within the donor and recipient countries. Based on the evaluation results, prepare a preliminary list of key environmental problems and socio-economic concerns that would likely have to be addressed at the time of eventual project shutdown or decommissioning.	- Comprehensive evaluations are normally undertaken a number of years after project completion. - An evaluation of the environmental aspects of a project is normally part of a much broader based project evaluation. - Terms of reference provide a good basis upon which to conduct an evaluation, however, they may not have been prepared for some projects. - There may be disagreement concerning the extent to which evaluation reports should be made available to the general public. - There is limited but growing experience with environmental cleanup following plant closures. - A specific terms of reference would need to be prepared for environmental cleanup and remediation at time of decommissioning or shutdown.

REFERENCES:

1. OECD (1992). *Development Assistance Committee: Guidelines on Environment and Aid No. 1, Good Practices for Environmental Impact Assessment of Development Projects*, Development Co-operation Directorate, OECD, Paris, 17 pp.
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4. OECD (1994). *Towards Coherence in Environmental Assessment, Volume III Summary of Country Policies and Procedures*, Results of the Project on Coherence of Environmental Assessment for International Bilateral Aid, Submitted by Canada to the DAC Working Party on Development Assistance and Environment, April, 1994.
5. OECD (1986). *OECD Council Recommendation concerning an Environmental Checklist for Possible Use by High-Level Decision-Makers in Bilateral and Multilateral Development Assistance Institutions*, OECD, Paris.
6. OECD (1992). *Guidelines on Environment and Aid No. 3, Guidelines for Aid Agencies on Involuntary Displacement and Resettlement in Development Projects*, Development Assistance Committee, Paris, 15 pp.

Topic 13

Social Impact Assessment

Introduction

Checklist

Session outline

Reference list and further reading

Training activities

Support materials

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Objectives

To develop an understanding of:

- the role and scope of Social Impact Assessment (SIA) in relation to the EIA process;
- the types of social impacts that can result from development proposals; and
- the principles, procedure and methods that are used to assess and mitigate social impacts.

Relevance

For certain projects, impacts on people can be by far the most important consideration. Adverse social impacts can reduce the intended benefits of a proposal, and can threaten its viability if they are severe enough. In such cases, a social impact assessment (SIA) is carried out as part of the EIA process, or sometimes as a parallel or separate review. This approach is used to analyse the impacts of a proposal on individuals and communities, and to mitigate the adverse effects and enhance the positive effects. It also provides a framework to manage social change.

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 locally relevant SIA procedure and methods, and examples of how they have been used;
- ☐ examples of any EIA reports which include reference to social impacts or stand alone SIA reports;
- ☐ examples of local studies or research on social change, processes and impacts of development, either generally or in relation to particular groups or communities;
- ☐ estimate of the resources (time, money and expertise) necessary to undertake an SIA of a major proposal, locally;
- ☐ contact names and telephone numbers of people, agencies, organisations and environmental information/data centres able to provide assistance in relation to social impacts and their assessment; and
- ☐ other resources that may be available such as videos, journal articles, computer programmes, lists of speakers, and case studies.

Session outline

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 they are important.



1

This topic provides an introduction to Social Impact Assessment (SIA) and describes the concepts, approaches and methods that are used. It provides basic guidance on why and how SIA is carried out *as an integral part of the EIA process*. Reference is made also to the more comprehensive forms of SIA. Full coverage of SIA would require a training manual of its own.

Briefly outline the role and purpose of SIA in relation to the EIA process. Note that social impacts may also require a comprehensive study, parallel to, but separate from, an EIA.



2

There is no widely agreed definition of SIA. Put simply, it focuses on the impact of development proposals on people. EIA legislation and procedures provide a framework for this purpose; for example, the term environment is defined broadly to include 'social', 'cultural', and other human dimensions. In this context, the aim of SIA is to identify the human consequences of a proposed action, giving particular attention to the mitigation of adverse or unintended aspects. This approach follows approximately the steps of the EIA process.

Under EIA mandates, the scope of SIA differs from country to country, depending on the institutional arrangements that are in place. The consideration of social impacts is triggered by and, in some cases limited to, environmentally related changes. These can be particularly important in developing countries where large numbers of people are dependent on the resource base for their subsistence and livelihood. In other cases, once an EIA is required for a proposal, major effects on the human environment can be considered in their own right. These can include potential changes to population, lifestyle, cultural traditions, community dynamics, and quality of life and well being.

A more comprehensive SIA may be carried out separately from the EIA process. For example, this division is institutionalised at the World Bank, where broadly based SIA, equivalent to understanding and management of social change processes, is promoted in support of the sustainable development agenda. This framework covers the full scope of social considerations, including poverty alleviation, gender balance, governance and institutions, and equity, rights and justice issues. Many SIA practitioners endorse such an overarching approach, beyond what is possible in the

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context of EIA. However, there is not yet a common understanding of its scope, boundaries and content (also called social appraisal or human impact assessment).

Introduce the concept of social impacts and what causes them. Ask participants to identify those that are important locally. Mention that social impacts were addressed in Topic 6 – *Impact analysis* and are an important part of an integrative approach as shown in Topic 15 – *Future directions*.

Social impacts can be defined as the consequences to people of any proposed action that changes the way they live, work, relate to one another, organise themselves and function as individuals and members of society. This definition includes social-psychological changes, for example to people's values, attitudes and perceptions of themselves and their community and environment. Indeed, some SIA practitioners consider social impacts to be only 'as experienced' (e.g. stress, disruption, hunger) and differentiate these from the causal processes (e.g. over-crowding, infrastructure pressure, poverty).

A composite list of social impacts is contained in Handout 13-1. However, these should be carefully reviewed for their relevance in a given situation or country, for example to development goals or to basic *needs* for food, water and shelter. Not all SIA practitioners would agree with the classification of impacts, and not all of the impacts listed are necessarily considered as part of EIA practice. In addition, many of the impacts listed are not easily measurable, and require analysis of a number of variables. For this reason, basic dimensions of social change are used instead as a reference point, for defining impacts and means of mitigating them.

The key characteristics and variables that are often correlated with adverse social impacts of development proposals include:

- demographic change, e.g. size and composition of resident population, influx of temporary work force or new recreational users (disrupts the cohesion of a small, stable community);
- economic change, e.g. new patterns of employment/ income, real estate speculation (marginalises long term, older residents);
- environmental change, e.g. alterations to land use, natural habitat and hydrological regime (loss of subsistence or livelihood in resource-dependent community); and
- institutional change, e.g. in the structure of local government or traditional leadership, zoning by-laws or land tenure (reduced access or loss of control leads to disempowerment or impoverishment of the established population).



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3



4

The main types of social impact that occur as a result of these project-related changes can be grouped into five overlapping categories:

- *lifestyle impacts* – on the way people behave and relate to family, friends and cohorts on a day-to-day basis;
- *cultural impacts* – on shared customs, obligations, values, language, religious belief and other elements which make a social or ethnic group distinct;
- *community impacts* – on infrastructure, services, voluntary organisations, activity networks and cohesion;
- *amenity/quality of life impacts* – on sense of place, aesthetics and heritage, perception of belonging, security and livability, and aspirations for the future; and
- *health impacts* – on mental, physical and social well being, although these aspects are also the subject of health impact assessment (see Topic 6 – *Impact analysis*).

The key points of the above discussion are that:

- social and biophysical impacts are interconnected and should be assessed together;
- SIA is understood to be concerned with the human consequences of development proposals, identifying all significant social impacts that arise in this context; and
- EIA combined with SIA is an entry point to integrated impact assessment in support of sustainability aims of maintaining natural capital and building human capital (see Topic 15 – *Future Directions*).

Note the types of projects that can require SIA, and indicate how social impacts can vary with different stages of the project life cycle. Ask participants to identify the social changes that are important locally in this context.

Social impacts can be a significant aspect of many types of projects, not only proposals for large scale development, such as a dam or highway, but also in the closing down of existing facilities, such as a military base or government facility. Like environmental impacts, the referents of project-induced social change include severity, duration, probability, importance, etc. They also vary with the setting and the characteristics of the community affected. For example, mining or energy developments adjacent to a small, remote community or in an area occupied or used by indigenous people are almost always associated with major social impacts.

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Often, in EIA, most attention is focused on such high profile issues, notably for projects which displace people and affect vulnerable ethnic minorities (as emphasised in the policy of the World Bank). These are unquestionably important internationally, not infrequently raising issues of human rights and social justice (see case example below). In particular, involuntary resettlement has extreme social impacts, which in many cases warrant separate and specific study. However, these issues are a relatively small subset of the overall social impacts associated with development projects.

Examples of projects with important and 'everyday' social impacts include:

- landfill and hazardous waste disposal sites (perceived health risks, loss of amenity);
- power and industrial plants (community stress from influx of work force, pressure on infrastructure);
- dams and reservoirs (lifestyle disruption resulting from relocation, land use alteration or long lead time to full impoundment); and
- roads and linear developments (dislocation of activity networks and relationships).

It is also important to consider how social impacts may vary in accordance with different stages of the project life cycle:

- *Planning or policy development* – This phase, beginning with project notification (or rumour) can have its own social impacts, even though nothing has actually happened. For example, the following can occur:
 - changed expectations or fears about the community and its future;
 - increase or fall in property prices depending on the nature of the proposal;
 - real estate speculation, which locks up or freezes land; and
 - concerns about the environmental, social or health impacts, which may lead to activism, resulting in community polarisation.
- *Construction/implementation* – This phase usually will have the greatest social impact. Construction work is socially disruptive. It frequently involves clearing land, building physical plant and putting in access roads and utilities. The resulting traffic congestion, dust, noise and other hazards typically undermine the quality of life of the resident population. Depending on project type and scale, there may be a large influx of temporary workers, whose demands and behaviour may be at odds with those of local people. In small communities, this phase often creates a strain on community infrastructure and may be marked by a boom and bust cycle. These changes, *inter alia*, may fuel resentment, affect community cohesion or undermine cultural values or traditional institutions.

- *Operation and maintenance* – This phase of a project normally continues over many years. In many cases, it will be relatively stable period compared to the social changes that occurred during construction. For one thing, operation requires fewer workers, and newcomers often become gradually assimilated into the community. Longer-term economic opportunities and social benefits from the development will be realized during this stage. On the other hand, the operation of power, industrial and waste treatment facilities can bring another set of social impacts and health hazards from pollution emissions. However, the community also may be different from that which existed before the project was constructed, possibly adjusting to an industrial operation if it is carefully managed.
- *Decommissioning or abandonment* – This phase can have a significant social impact, especially where a facility is the mainstay of the local economic base or the only employer as in a single purpose mining community. Depending on condition and location, it may be possible to convert a site to its former or an alternative use, such as restoring an open pit mine for agriculture or recycling a port facility to recreational or commercial use. In other cases, however, industrial lands may be contaminated and require costly remediation treatment to rehabilitate or secure them to ensure the health and safety of nearby residents.

Box 1: Social impact of the Sardar Sarovar scheme, India

Project background

Long planned, construction of the Sardar Sarovar scheme began in 1987. It comprises: a high dam on the Narmada River approximately 180 km upstream from the Arabian Sea; a large reservoir impounding water to a level of approximately 150m and submerging 37,000 hectares of land across three states; the diversion of 9.5 million acre feet of water from the Narmada River into a canal and irrigation system to deliver drinking and irrigation water to drought-prone areas of Gujarat. The main canal is 250m wide at its head and 100m wide at the Rajasthan border 450 km distant. With an aggregate length of 75,000 km, the distribution network will require approximately 80,000 hectares of land, double the submergence area.

Social issues and impacts

The environmental and social impact of the project components is immense and extends over a wide area. At least 100,000 people, in 245 villages, live in the area affected by submergence. In Gujarat and Maharashtra almost all of those affected are tribal people. In addition, there are 140,000 families who will be disrupted by the construction of the canal and irrigation system. Finally, there are the people living downstream below the dam, numbering thousands more, who also will be adversely affected. Sardar Sarovar became the focus of the debate, in India and internationally, on how to balance economic development on the one hand, and human rights and environmental protection on the other.

Independent SIA and EIA review

Now in its final stages, the scheme was also heavily criticised because of the deficiencies in the EIA and SIA processes which were applied. In 1992, the Sardar Sarovar scheme became the subject of an independent review commissioned by the World Bank and triggered by its credit and loan agreement with the Indian and state governments involved. On the social side, the review was to consider the measures being taken for the resettlement and rehabilitation of people displaced or affected by the reservoir and infrastructure or affected by the canal. On the environmental side, it was to consider measures being taken to ameliorate the impact of 'all aspects of the Projects'.

Key findings and conclusions

At the time of the review, World Bank directives had set the highest standards for mitigating adverse consequences to people who were to be involuntarily resettled (although these were not in force when the credit and loan agreements were signed). Bank policy requires that those displaced improve or at least regain their prior standard of living. In addition, their human rights must be respected, and cannot be nullified on grounds of national sovereignty or economic interest.

The issues in Sardar Sarovar were complicated because the majority of those displaced were tribal people who usually have no formal title to the land they occupy and were considered by two state governments to be encroachers and not entitled to resettlement. The review found this position to be non-compliant with recognized norms of human rights. In addition, it concluded that a number of issues of related to the environmental impact of the scheme were unresolved and questioned the assumptions used in project design and mitigation.

After the Bank issued performance 'benchmarks' for the scheme, India advised that it would not call on the outstanding balance of the loan and would complete the Sardar Sarovar itself.

Source: Berger (1994).

Describe the benefits of SIA, highlighting the importance of systematically addressing the human consequences of major proposals. Ask participants to develop a list of benefits relating to local conditions.

Despite increasing use, SIA still is not uniformly required or carried out for all development proposals with significant human consequences. This is the case in many developing countries, where meeting basic human needs is understandably seen as an overwhelming priority. However, the Sardar Sarovar scheme (Box 1) exemplifies how disregarding social impacts can alter the benefit-cost equation of development and, in this case, undermine its overall viability. Many dams and other types of projects, with potentially significant social impacts, have been criticised because an inadequate SIA or



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none at all was carried out (see, report of the World Commission on Dams at <http://www.dams.org>).

For such projects, the benefits of undertaking a systematic SIA can include:

- *reduced impact* on communities or individuals – identification of mitigation measures is an integral element of SIA;
- *enhanced benefits* to those affected – SIA preparation also helps identify measures such as job training packages;
- *avoiding delays and obstruction* – a well prepared SIA demonstrates that social impacts are taken seriously and helps to gain development approval;
- *lowered costs* – addressing social impacts and mitigation measures at an early stage helps to avoid costly errors and remedial actions imposed at a later stage by regulatory agencies;
- *better community and stakeholder relationships* – experience has shown that SIA can help to allay fear and concern and build a basis of trust and cooperation necessary for the proponent to successfully introduce and operate the project; and
- *improved proposals* – an SIA provides information that adds value to existing projects and helps to design future ones.

In many cases, the above benefits of SIA are not anticipated or expected by the different parties involved in the process. For example:

- developers may focus only on the short term costs of the SIA, see it as a process that may be ‘hijacked’ by proponents, or consider the risk of early disclosure outweighs any potential benefit of conducting the study;
- governments or decision makers may not support transparency of the decision making process; and
- communities may not consider the SIA process as impartial or may see it as a mechanism to deflect their objections to a project.

Discuss the steps and principles of SIA, noting the similarities and differences to the process followed in EIA.

Typically, the SIA process follows the iterative steps taken in the EIA process, although with a different emphasis to take account of the impacts on people (as shown in Box 2 below). Most obvious is the particular type of information gathered for an SIA, which can include basic characteristics of the affected population, current issues, political and civic institutions, social structures, cultural traditions and attitudes and social-psychological attributes. A participatory approach is also strongly represented in the SIA process, beginning at the earliest stage and continuing throughout. Other

elements of the SIA process that are distinctive include prediction of impacts in terms of how affected people will respond in attitude and behaviour.

As in EIA, SIA practitioners place considerable importance on mitigation, monitoring and impact management. In addition, post-project analysis is recognised as critical to gaining a better understanding of social impacts and how to manage them. However, in practice, implementation and follow up are not always undertaken systematically, and, often, SIA continues to be a one-off exercise that cannot be grounded in the context of comparable projects. This process constrains SIA practice, undermines its potential contribution to decision-making and inhibits its acceptance by others; for example, when people affected by a proposed change, understandably, individualise and exaggerate impacts and comparable, empirical information is wanting.

In this context, considerable guidance is now available on SIA good practice, both generally and with specific reference to EIA procedures established by countries or international agencies such as the World Bank. The principles and guidelines outlined in Box 3 were prepared by leading SIA practitioners from the US. However, they are sufficiently generic to have gained a measure of international acceptance. Most importantly, perhaps, the principles and main steps of the SIA process indicate how common issues of SIA practice, such as data limitations, can be addressed.

Other SIA practitioners have refined this framework to meet their particular purposes. Currently, an IAIA project is underway to develop International Guidelines and Principles for Social Impact Assessment (see www.iaia.org). For example, this project has identified principles relating to the integration of biophysical and social impacts which:

- recognize that all environmental impacts are experienced in human terms;
- extrapolate all biophysical changes to their implications for people; and
- take account of the implications of seasonality for people and their activities.

Ideally, an interdisciplinary approach will be taken to integrate SIA and EIA studies (see Topic 12 – *EIA project management*). At a minimum, the information on social and environmental impacts should be synthesised into a coherent impact statement (see Topic 8 – *Reporting*). When an SIA is conducted as a separate study or is a major component in its own right, it should be conducted with reference to the EIA process (and *vice-versa*) and key findings should be cross referenced.



6 & 7

Box 2: Steps in the SIA process

1. *public involvement* – develop and implement an effective public involvement plan to involve all interested and affected stakeholders
2. *identification of alternatives* – describe the proposed action and reasonable alternatives to it, including the no action alternative
3. *profile of baseline condition* – document the relevant human environment/area of influence of the proposal and the existing social conditions and trends (using the characteristics and variables described previously)
4. *scoping* – identify and prioritise the range of likely social impacts through a variety of means, including discussion or interviews with numbers of all potentially affected
5. *projection of estimated effects* – analyse and predict the probable impacts of the proposal and the alternatives against baseline conditions (with versus without the action)
6. *prediction and evaluation of responses to impacts* – determine the significance of the identified social impacts to those who will be affected
7. *estimate indirect and cumulative impacts* – identify the subsequent, flow-on effects of the proposal, including the second/third order impacts and their incremental impacts when added to other past, present and foreseeable current activities
8. *changes to alternatives* – recommend new or changed alternatives and estimate or project their consequences for affected and interested stakeholders
9. *mitigation* – develop and implement a mitigation plan, in order of preference to firstly avoid, secondly minimise and thirdly compensate for adverse impacts
10. *monitoring* – develop and implement a monitoring programme to identify deviations from the proposed action and any important unanticipated impacts

Source: Interorganizational Committee on Guidelines and Principles [for Social Impact Assessment] (1994).



8 & 9

Box 3: Principles of SIA good practice

- *involve the diverse public* – identify and involve all potentially affected groups and individuals
- *analyse impact equity* – identify who will win and who will lose, and emphasise vulnerability of under-represented groups
- *focus the assessment* – deal with the issues and public concerns that really count not those that are just 'easy to count'

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- *identify methods and assumptions and define significance* – describe how the SIA is conducted, what assumptions are used and how significance is determined
- *provide feedback on social impacts to project planners* – identify problems that could be solved with changes to the proposed action or alternatives
- *use SIA practitioners* – trained social scientists employing social science methods will provide the best results
- *establish monitoring and mitigation programmes* – manage uncertainty by monitoring and mitigating adverse impacts
- *identify data sources* – use published social scientific literature, secondary data and primary data from the affected area
- *plan for gaps in data* – make clear any incomplete or unavailable information and the reasons why this could not be obtained

Source: *Interorganizational Committee on Guidelines and Principles [for Social Impact Assessment]* (1994).

Review the methodological frameworks, sources of information and tools that are used in SIA. Ask participants to consider the approach that might be applied to assess social impacts that are relevant locally.

There are sharp differences among SIA experts on the methodological frameworks that should be applied to assess social impacts. A number of orientations can be identified. Notably, there is a polarisation between the rational-scientific approach, which emphasises prediction of change (with versus without the project), and the socio-political approach, where SIA is oriented toward community development and empowerment. In practice, however, these differences may not be so apparent, moderated by EIA procedure and Terms of Reference and by a common emphasis on the management of social impacts.

Both schools of SIA draw on the following sources of information:

- data about the proposal;
- experience with similar actions, e.g. as evidenced in other SIA reports;
- census and vital statistics on the area/ population affected;
- secondary materials, which document baseline conditions and trends; and
- survey and field research, including interviews, meetings and other contact means.

A number of tools and techniques are used to assess the human impact of development proposals. Much of the analytical work in SIA centres on prediction of potential change in key social variables as established in the



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scoping phase. Some of the methods that are commonly applied for this purpose are outlined in Box 4. A larger kit of social assessment tools and methods identified by the World Bank are described in Handout 13-2. It classifies methods into five types of overlapping approach: analytical, community-based, observation and interview, participatory, and workshop-based.

The World Bank tool kit has particular reference to SIA in the context of developing countries. It emphasises interactive methods, which can be used to collect baseline information, to build a profile of the existing social situation and to gain an understanding of how a proposal might affect a community. Some of the methods engage stakeholders directly in the process of predicting impacts. For example, participatory and community-based approaches involve affected local people in estimating how their lifestyles are likely to alter as a result of projected changes. However, these estimates should be corroborated, especially if there is no local experience of the kinds of impacts expected.

Depending on its scope, an SIA may use a number of tools and techniques. This can help to address the problem of incomplete data, as well as compare and highlight any variations in information derived from different sources. Generally, an integrated approach, which combines a number of methods, will provide the most composite and reliable prediction of impacts and identification of suitable measures to mitigate and manage them. In practice, however, this is not always possible, and often no more than two or three SIA tools will be used in an EIA-based process.

At a minimum, the prediction of social impacts should be based on:

- understanding of the affected population – how are people likely to respond to and be affected by a given proposal?
- comparison with similar cases – what is the experience with the effects of proposed actions on similar communities elsewhere?
- appropriate expertise and knowledge base – has the analysis been undertaken by an experienced SIA practitioner using suitable methods and tools?

Box 4: Methods commonly used for predicting social impacts

trend extrapolations – projecting current trends, such as population change or employment, into the future (with or without modifying the rate of change)

population multipliers – extrapolated increases in population size are coefficients for the change in other variables, such as employment and demand for housing, infrastructure or services

consulting experts – use of expert knowledge such as researchers, professional consultants, local authorities, or knowledgeable citizens



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scenarios – exercises to develop the likely, alternative or preferred future of a community or society. Scenarios can be used to compare different outcomes (best versus worst case)

comparative studies – examining how an affected community has responded to change in the past, or the impact on other communities that have undergone a similar action

Source: adapted from Taylor, Goodrich and Bryan (1998).

Consider aspects of good practice in the conduct of an SIA study, including factors that need to be taken into account to implement the principles described earlier. Ask participants to consider which aspects are important when assessing social impacts locally.

When conducting an SIA, the following factors and considerations can assist in implementing and amplifying the principles set out in Box 3:

- *identifying trends* – when gathering baseline data on an affected community, it is important to situate the profile or 'snap shot' in a dynamic context by identifying the changes that are occurring already from non-project sources;
- *taking account of initial response to project announcement* – support or opposition may be an impact itself or an indicator of the likely degree of community cohesion or conflict over social issues;
- *qualifying data sufficiency and reliability* – where SIA is hampered by a lack of adequate data, err on the conservative side in reporting any potentially significant impacts (e.g. stating that it cannot be ruled out with confidence rather than concluding it is not proven);
- *predicting key issues* – it is better to be roughly correct on the matters that count, rather than quantifying the impacts that can be counted; and
- *team building* – experienced social scientists need to be an integral part of the EIA team to predict these key issues and establish linkages to biophysical impacts. Often, team building must address cultural style as well as disciplinary differences, for example when relating an SIA to the EIA and project planning timetable on the one hand and the norms and traditions of an affected community on the other.

Analysing impact equity, who gains and who loses from a proposal, is central to the SIA process. Good practice principles are set out in Box 5. Normally, emphasis will be given to identifying and mitigating adverse impacts. These impacts should be specified and reported for each group likely to be differently affected and appropriate mitigation measures taken to ensure their brunt is not borne disproportionately. In this regard, particular attention is given to highlighting adverse impacts on people who



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are sensitive or vulnerable, for example by reason of age, gender, ethnicity, caste, poverty or other factors.

Examples include:

- communities and groups who are dependent on land and resources for their subsistence and livelihood, typically, are significantly affected by a proposal that reduces or degrades the resource base or alters their access, use or management regime;
- indigenous peoples and ethnic minorities are at particular risk in this regard, since their culture, lifestyle and values are inseparably attached to their environment;
- long term residents or the elderly may suffer greater health and psychological impacts than other groups as a result of community disruption; and
- the poor, landless, illiterate and disadvantaged often struggle to express or press their concerns because they lack political power and influence over events.

Impact equity can be effectively assessed only if an attempt is made to minimise any bias and take full account of the consequences for disadvantaged and marginalised groups. SIA practitioners guard against the following factors:

- *spatial bias* – information gathering focuses on accessible locations and overlooks remote or nomadic tribes;
- *seasonal bias* – an SIA may be carried out at a time when it is difficult to gain a representative information on an affected community, for example during harvest time or hunting season;
- *personal bias* – consultation and interviews may be dictated by cultural traditions or power structures, for example limited to political leaders, elders or men; and
- *professional bias* – lack of interaction between disciplinary specialists may result in important links between the environment and society being omitted.

Box 5: Good practice in analysing impact equity

- predict adverse impacts
- specify for each group
- explain reasons for variations
- highlight impacts on vulnerable groups
- guard against representational bias



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Conclude by stressing the importance of good practice in mitigation, monitoring and management of social impacts. Ask participants to consider which are locally the most important aspects in mitigating social impacts.

The practical emphasis in SIA is on mitigation of the adverse impacts of a proposal and, more broadly, the management of social change. Principles that are specific to impact management and minimisation are summarised in Box 6. These elaborate the guiding principles introduced earlier (Box 3) and recognise the need for a proactive approach to this phase of SIA. In particular, the concern is to move away from a narrow focus on the role of prediction, seeing it as a necessary step to design customised measures for avoiding, reducing and managing social impacts, for example of an influx of construction workers into a small settlement.

Mitigation for social impacts should follow the same hierarchy that is used for other types of impact (see Topic 7 – *Mitigation and impact management*). This gives priority first to impact avoidance, second to reduction or minimisation of impacts, and lastly to offset or compensation. Social impacts can be avoided by 'at source' changes, for example, site selection of a dam or airport project so people do not have to be relocated or their lives disrupted. Impacts can be reduced by various measures, such as sound proofing houses within the noise footprint of an airport, scheduling construction traffic, use of dust suppression techniques, etc. Compensation should be used for residual impacts only where no other options are available to ensure people are no worse off than before.

Where compensation is unavoidable, it is often inappropriate to provide this only in monetary form. This is invariably the case for indigenous peoples and other vulnerable communities, which cannot replicate their lifestyle elsewhere or mediate the impacts experienced. In other cases, monetary compensation places the onus of solving the problem on the individual or community, rather than on those who are responsible for causing the impact. Equally, however, there are circumstances where a compensation package can be used in positive and innovative ways to support social development that otherwise may not be possible.

Monitoring and other follow up activities are critical to strengthening mitigation practice and to improving the effectiveness of SIA, in general. As in EIA, the main purpose of monitoring is to identify differences between predicted and actual social impacts in order to determine whether and what type of adjustments and interventions are necessary (see Topic 11 – *Implementation and follow up*). In developing and transitional countries, where experience with SIA may be limited, institutional and capacity building may be required to effectively carry out impact management. SIA training needs and priorities for a given country may differ from those identified for EIA in

general, and should be specified separately (see Topic C – *Training needs analysis*).



14 & 15

Box 6: Good practice in impact mitigation and management

- identify mitigation measures for each impact
- customise them to the different groups affected
- give priority to avoiding social impacts
- then minimise them as far as practicable
- use compensation as a last resort
- ensure impacts are not borne disproportionately by one group
- no one should be worse off than before
- treat relocation/resettlement as a special case
- livelihoods of those displaced should be improved
- enhance benefits for local people through job training and development packages

Include a training activity to reinforce the topic (if desired).

Summarise the presentation, emphasising those aspects of the topic that apply locally.

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Reference list

The following references have been quoted directly, adapted or used as a primary source for major parts of this topic.

Berger T (1994) The Independent Review of the Sardor Sarovar Projects, 1991-1992. *Impact Assessment* 12:1, 3-20.

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Taylor N, Goodrich C and Bryan H (1998) Social Assessment. In Porter A and Fittipaldi J (eds) *Environmental Methods Review: Retooling Impact Assessment for the New Century* (pp.210-218). The Press Club, Fargo, USA.

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World Commission on Dams (2001) *Dams and Development: A New Framework for Decision-Making*. Earthscan, London (also at) <http://www.dams.org>

Further reading

Asian Development Bank (1994) *Handbook for the Incorporation of Social Dimension in Projects*. Social Development Unit, Asian Development Bank, Manila, Philippines.

Burdge R and Vanclay F (1995) Social Impact Assessment in Vanclay F and Bronstein D (eds) *Environmental and Social Impact Assessment* (pp. 31-65). John Wiley & Sons, Chichester, UK.

Cernea M and Kudat A (eds) (1997) *Social Analysis for Investment Projects: Rationale, Content and Methods*. ESSD Monograph 16, World Bank, Washington, D.C.

Finsterbusch K, Ingersoll J and Llewellyn L (1990) *Methods for Social Analysis in Developing Countries*. Westview Press, Boulder, Colorado, USA.

Reitbergen-McCracken J and Narayan D (1998) *Participation and Social Assessment: Tools and Techniques* (Book and video). Social Development Family, 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

- 13-1 What types of social issues and impacts are associated with development proposals locally?
 - 13-2 How are these impacts addressed and under which processes? Does the EIA process apply? If not, is this because of the legal provision or just accepted practice?
 - 13-3 What changes, if any, would be necessary to include consideration of social impacts in the EIA process? What should be the scope of consideration of social impacts in EIA? Should there be a separate SIA process?
 - 13-4 Where SIA is part of EIA it follows similar steps, including scoping and consideration of alternatives. What information needs to be gathered to identify the key social impacts of a development proposal? How might this information then be used to identify feasible alternatives to a proposal?
 - 13-5 SIA methodology involves estimating the response of people to predicted impacts and evaluating who gains and who loses (impact equity). How might these activities be carried out as part of an SIA conducted locally? What methods and expertise would be needed and available for this purpose?
 - 13-6 What measures might be used to mitigate social impacts that are important locally? How could their effectiveness be monitored, and what management strategies could be adopted in the event that an impact is greater than forecast?
 - 13-7 Consider whether local capacity and data sources are sufficient to carry out the key stages and activities of SIA. If not, how can the information and expertise best be developed, and what kind of strategy can be followed in conducting SIA in the interim?
-

Speaker themes

- 13-1 Invite a speaker who is knowledgeable about the local societal structure and values to review key trends and developmental issues, and to provide a perspective on how communities and groups respond to proposed actions.
 - 13-2 Invite a speaker who has experience in managing or conducting an SIA locally to discuss the various approaches/methodologies that have been used and how they could be improved in future work. The presentation should be supported by examples of the work.
 - 13-3 Invite a speaker who has experience with SIA methods to show the participants how they work and what they can be used for. Ensure that some of the discussion covers the data requirements for the method and that note is made of any limitations.
-

Group Activity 13-1: Determining the scope of an SIA

Title: Social impact scoping

Aim: To understand how scoping procedures can be used to identify the key social impacts of a proposal

Group size: Four to six people

Duration: Half to one day, depending on the desired level of detail

Resources required:

- ☐ Background information from local project(s).
- ☐ Copies of Handout 13-1.
- ☐ Summary of Topic 5 – *Scoping*.
- ☐ Examples of EIA checklists, matrices etc that can be adapted to identify the social impact of candidate project(s).

Description of activity:

- ☐ Get the group as a whole to review Handout 13-1 to adapt/develop a shortlist of social impacts that are relevant locally in relation to development proposals.
 - ☐ Assign each group the task of adapting and applying one of the methods (matrix, checklist etc) to identify the social impacts for a project.
 - ☐ Assemble the group as a whole and ask each small group to summarise its findings, noting any problems that were encountered, the impacts that were identified and how the method used might be improved.
-

Group Activity 13-2: Review of social impact assessment

Title: Consideration of impact equity – who gains and who loses

Aim: To gain an appreciation of the quality of an SIA report and how it can be evaluated

Group size: Pairs

Duration: Half to one day, depending on the required level of detail

Resources required:

- ☐ An EIA/SIA report for each pair (prepared locally or containing information on social impacts that are relevant locally).
- ☐ Handout 13-2 – Social assessment methods.

Description of activity :

Each pair is to:

- ☐ review the EIA/SIA report, listing the groups that were affected and the major social impacts that were identified;
- ☐ check whether or not the impacts predicted were differentiated in relation to each affected group and there was a statement of who gained and who lost;
- ☐ summarise the strengths and weaknesses of the approach taken, including the methods used and the way the findings were reported; and
- ☐ recommend how the approach could have been improved, giving particular attention to methods that may be more suited to assess impact equity.

The whole group should convene to discuss the findings.

Assemble the group as a whole and ask each small group to summarise its findings, noting any problems that were encountered, the impacts that were identified and how the methods used might be improved.

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1

Aims and objectives of SIA are to:

- analyse how proposals affect people
- identify and mitigate adverse impacts
- enhance benefits
- help manage social change



2

Scope of SIA

- SIA conducted under EIA legislation and procedure
- scope of SIA differs with jurisdictional arrangements
- initially limited to environmentally-related changes
- larger range of social impacts now considered
- comprehensive SIA often a separate process
- focuses on social issues of sustainable development, poverty alleviation and justice



3

Causes of social impacts

- demographic change, e.g. population size and composition
- economic change, e.g. employment and income
- environmental change, e.g. air and water quality
- institutional change, e.g. law and administration



4

Types of social impact

- lifestyle – behaviour and relationships
- cultural – customs, values and religious beliefs
- community – infrastructure, services and networks
- amenity/quality of life – sense of security, livability and futurity
- health – mental and physical well being



5

SIA benefits can include:

- reduced impact on people
- enhanced benefits for those affected
- avoiding delays and obstruction
- lowering costs by timely actions
- better community and stakeholder relationships
- improved future proposals



6 & 7

Steps in the SIA process

- public involvement plan
- identification of alternatives
- profiling of baseline conditions
- scoping of key issues
- projection of estimated effects
- prediction and evaluation of responses to impacts
- estimate indirect and cumulative impacts
- recommend changes to alternatives
- develop and implement a mitigation plan
- develop and implement a monitoring programme



8 & 9

Principles of SIA good practice

- involve the diverse public
- analyse impact equity
- focus the assessment
- identify methods and assumptions and define significance
- provide feedback on social impacts to project planners
- use experienced SIA practitioners
- establish monitoring and mitigation programmes
- identify data sources
- plan for gaps in data



10

Sources of SIA information

- data on the proposal
- experience with similar actions
- census and vital statistics
- secondary documents
- survey and field research



11

Methods commonly used for predicting social impacts include:

- trend extrapolations
- population multipliers
- use of expert knowledge
- scenario building
- comparative studies



12

Basis of good practice in prediction of social impacts

- understanding those affected and their likely responses
- comparisons with experience in similar cases
- use of appropriate expertise and knowledge base



13

Good practice in analysing impact equity

- predict adverse impacts
- specify for each group
- explain reasons for variations
- highlight impacts on vulnerable groups
- guard against representational bias



14 & 15

Good practice in impact mitigation and management

- identify mitigation measures for each impact
- customise them to the different groups affected
- give priority to avoiding social impacts
- then minimise them as far as practicable
- use compensation as a last resort
- ensure impacts are not borne disproportionately by one group
- no one should be worse off than before
- treat relocation/resettlement as a special case
- livelihoods of those displaced should be improved
- enhance benefits for local people through job training and development packages

Social Impact Assessment methods

Social Impact Assessment methods**Individual and household level**

1. death, death of family member
2. arrest, imprisonment, detention, torture, intimidation or other abuse of human rights inflicted on individual
3. reduced availability of food and adequate nutrition
4. reduced control over fertility (availability of contraception, and empowerment)
5. reduced level of health and fertility (ability to conceive)
6. reduced mental health increased stress, anxiety, alienation, apathy, depression
7. uncertainty about impacts, development possibilities, and social change
8. actual personal safety, hazard exposure
9. experience of stigmatisation and deviance labelling
10. reduction in perceived quality of life
11. reduction in standard of living, level of affluence
12. worsening of economic situation, level of income property values
13. decreased autonomy, independence, security of livelihood
14. change in status or type of employment, or becoming unemployed
15. decrease in occupational opportunities potential diversity flexibility in employment
16. moral outrage, blasphemy, religious affront, violation of sacred sites
17. upset (objection/opposition to the project), NIMBY (not in my back yard)
18. dissatisfaction due to failure of a project to achieve heightened expectations
19. annoyance (dust, noise, strangers, more people)
20. disruption to daily living, way of life (having to do things differently)
21. reduction in environmental amenity value
22. perception of community, community cohesion, integration
23. community identification and connection to place (do I belong here?)
24. changed attitude towards local community, level of satisfaction with the neighbourhood
25. disruption to social networks
26. alteration in family structure and stability (divorce)
27. family violence
28. gender relations within the household
29. changed cultural values
30. changed perceptions about personal health and safety, risk, fear of crime
31. changed leisure opportunities
32. quality of housing
33. homeliness
34. density and crowding

Social Impact Assessment methods

- 35. aesthetic quality, outlook, visual impacts
- 36. workload, amount of work needed to be undertaken to survive/live reasonably

Community and institutional level

- 1 death of people in the community
- 2 violation of human rights, freedom of speech
- 3 adequacy of physical infrastructure (water supply, sewerage, services and utilities)
- 4 adequacy of community social infrastructure, health, welfare, education, libraries, etc.
- 5 adequacy of housing in the community
- 6 workload of institutions, local government, regulatory bodies
- 7 cultural integrity (continuation of local culture, tradition, rites)
- 8 rights over, and access to, resources
- 9 influences on heritage and other sites of archaeological, cultural or historical significance
- 10 loss of local language or dialect
- 11 debasement of culture
- 12 equity (economic, social, cultural)
- 13 changed equity /social justice issues in relation to minority or indigenous groups
- 14 gender relations in the community
- 15 economic prosperity
- 16 dependency/autonomy/diversity/viability of the community
- 17 unemployment level in the community
- 18 opportunity costs (loss of other options)
- 19 actual crime
- 20 actual violence
- 21 social tensions, conflict or serious divisions within the community
- 22 corruption, credibility and integrity of government
- 23 level of community participation in decision making
- 24 social values about heritage and biodiversity

Adapted from: Vanclay F (updated version) Summary of work on IAIA International Guidelines and Principles for Social Impact Assessment.

Social Impact Assessment tools and methods

Social Impact Assessment tools and methods**Analytical tools**

Stakeholder Analysis is an entry point to SIA and participatory work. It addresses strategic questions, e.g. who are the key stakeholders? what are their interests in the project or policy? what are the power differentials between them? what relative influence do they have on the operation? This information helps to identify institutions and relations which, if ignored, can have negative influence on proposals or, if considered, can be built upon to strengthen them.

Gender Analysis focuses on understanding and documenting the differences in gender roles, activities, needs and opportunities in a given context. It highlights the different roles and behaviour of men and women. These attributes vary across cultures, class, ethnicity, income, education, and time; and so gender analysis does not treat women as a homogeneous group.

Secondary Data Review of information from previously conducted work is an inexpensive, easy way to narrow the focus of a social assessment, to identify experts and institutions that are familiar with the development context, and to establish a relevant framework and key social variables in advance.

Community-based methods

Participatory Rural Appraisal (PRA) covers a family of participatory approaches and methods, which emphasises local knowledge and action. It uses to group animation and exercises to facilitate stakeholders to share information and make their own appraisals and plans. Originally developed for use in rural areas, PRA has been employed successfully in a variety of settings to enable local people to work together to plan community-appropriate developments.

SARAR is an acronym of five attributes -- self-esteem, associative strength, resourcefulness, action planning and responsibility for follow-through -- that are important for achieving a participatory approach to development. SARAR is a philosophy of adult education and empowerment, which seeks to optimise people's ability to self-organize, take initiatives, and shoulder responsibilities. It is best classed as an experiential methodology, which involves setting aside hierarchical differences, team building through training, and learning from local experience rather than from external experts.

Consultation methods

Beneficiary Assessment (BA) is a systematic investigation of the perceptions of a sample of beneficiaries and other stakeholders to ensure that their concerns are heard and incorporated into project and policy formulation. The purposes are to (a) undertake systematic listening, which "gives voice" to poor and other hard-to-reach beneficiaries, highlighting constraints to beneficiary participation, and (b) obtain feedback on interventions.

Observation and interview tools

Participant Observation is a field technique used by anthropologists and sociologists to collect qualitative data and to develop in-depth understanding of peoples' motivations and attitudes. It is based on looking, listening, asking questions and keeping detailed field notes. Observation and analysis are supplemented by desk reviews of secondary sources, and hypotheses about local reality are checked with key local informants.

Semi-structured Interviews are a low-cost, rapid method for gathering information from individuals or small groups. Interviews are partially structured by a written guide to ensure that they are focused on the issue at hand, but stay conversational enough to allow participants to introduce and discuss aspects that they consider to be relevant.

Focus Group Meetings are a rapid way to collect comparative data from a variety of stakeholders. They are brief meetings -- usually one to two hours -- with many potential uses, e.g. to address a particular concern;

Social Impact Assessment tools and methods

to build community consensus about implementation plans; to cross-check information with a large number of people; or to obtain reactions to hypothetical or intended actions.

Village Meetings allow local people to describe problems and outline their priorities and aspirations. They can be used to initiate collaborative planning, and to periodically share and verify information gathered from small groups or individuals by other means.

Participatory methods

Role Playing helps people to be creative, open their perspectives, understand the choices that another person might face, and make choices free from their usual responsibilities. This exercise can stimulate discussion, improve communication, and promote collaboration at both community and agency levels.

Wealth Ranking (also known as well-being ranking or vulnerability analysis) is a visual technique to engage local people in the rapid data collection and analysis of social stratification in a community (regardless of language and literacy barriers). It focuses on the factors which constitute wealth, such as ownership of or right to use productive assets, their relationship to locally powerful people, labour and indebtedness, and so on.

Access to Resources is a tool to collect information and raise awareness of how access to resources varies according to gender, age, marital status, parentage, and so on. This information can make all the difference to the success or failure of a proposal; for example, if health clinics require users to pay cash fees, and women are primarily responsible for accompanying sick or pregnant family members to the clinic, then women must have access to cash.

Analysis of Tasks clarifies the distribution of domestic and community activities by gender and the degree of role flexibility that is associated with each task. This is central to understanding the human resources that are necessary for running a community.

Mapping is an inexpensive tool for gathering both descriptive and diagnostic information. Mapping exercises are useful for collecting baseline data on a number of indicators as part of a beneficiary assessment or rapid appraisals, and can lay the foundation for community ownership of development planning by including different groups.

Needs Assessment draws out information about people's needs and requirements in their daily lives. It raises participants' awareness of development issues and provides a framework for prioritising actions and interventions. All sectors can benefit from participating in a needs assessment, as can trainers, project staff and field workers.

Pocket Charts are investigative tools, which use pictures as stimulus to encourage people to assess and analyse a given situation. Made of cloth, paper or cardboard, pockets are arranged into rows and columns, which are captioned by drawings. A "voting" process is used to engage participants in the technical aspects of development issues, such as water and sanitation projects.

Tree Diagrams are multi-purpose, visual tools for narrowing and prioritising problems, objectives or decisions. Information is organized into a tree-like diagram. The main issue is represented by the trunk, and the relevant factors, influences and outcomes are shown as roots and branches of the tree.

Workshop-based methods

Objectives-Oriented Project Planning is a method that encourages participatory planning and analysis throughout the project life cycle. A series of stakeholder workshops are held to set priorities, and integrate them into planning, implementation and monitoring. Building commitment and capacity is an integral part of this process.

TeamUP was developed to expand the benefits of objectives-oriented project planning and to make it more accessible for institution-wide use. PC/TeamUP is a software package, which automates the basic step-by-step methodology and guides stakeholders through research, project design, planning, implementation, and evaluation.

Source: edited and abridged from document on the World Bank web site (<http://www.worldbank.org>.)

Topic 14

Strategic Environmental Assessment

Introduction

Checklist

Session outline

Reference list and further reading

Training activities

Support materials

Topic 14 – Strategic Environmental Assessment

Objective

To gain an understanding of:

- the rationale and objectives of Strategic Environmental Assessment (SEA);
- the institutional arrangements that are in place to undertake SEA;
- the scope of application of SEA in relation to levels and types of decision-making;
- key principles of SEA and elements of good practice; and
- the procedures and methods that are used to carry out this process.

Relevance

The introduction of SEA extends the aims and principles of EIA upstream to the higher, pre-project level of decision-making. It affords an important new means of analysing and addressing the environmental effects of policies, plans, programmes and other proposed strategic actions. All those involved in EIA practice should have an understanding of SEA – what it is, why it has emerged and how it contributes to informed decision-making in support of environmental protection and sustainable development.

Timing

Note: This Topic is in two parts each of two-hours (not including training activity).

Important note to trainers

Presentation of this topic should be tailored to participants' interests and their involvement at policy making levels. The relevance of some sections of the materials will depend on how widely SEA has been accepted and whether or not there is institutional support locally or in the region.

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Information checklist

SEA is not as widely practised as project EIA, and therefore some of the resources listed below may not be readily available.

Nevertheless, it will be helpful to obtain or develop the following, as appropriate:

- ☐ details of recent or proposed policies, plans or laws that could result in significant environmental effects and that might be subject to an SEA;
- ☐ background information on the operation of strategic decision-making processes (e.g. related to policies, plans and programmes);
- ☐ any examples of SEA or equivalent processes that have been applied locally;
- ☐ other reports or studies on or relevant to the environmental effects of policies, programmes or plans, for example:
 - state of the environment reports
 - national sustainable development plans
 - environmental or sustainability indicators;
- ☐ contact names and telephone numbers of people, agencies, organisations and environmental information data resource centres able to provide assistance with SEA; and
- ☐ other resources that may be available such as courses in specific analytical or methodological techniques, videos, journal articles, computer programmes, lists of speakers, and case studies.

Session outline

Note: This session has been divided into two parts. Part 1 is intended to provide an introduction to SEA concepts and principles. Part 2 is intended for those participants who require further information on different forms of SEA and elements of procedure, methods and practice. By completing both parts trainers can provide a comprehensive overview of the subject.

Topic 14 Part 1

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

This topic introduces the concept and practice of Strategic Environmental Assessment (SEA), and places it within a broad, comparative framework. Although relatively new, there is increasing recognition of the importance of SEA as a tool for analysing and addressing the environmental effects of policy, plans, programmes and other proposed strategic actions. In comparison to EIA, the nature and scope of SEA processes are characterised by greater diversity, and this point needs to be emphasised when considering their potential application to levels and types of decision-making that are relevant locally.

Briefly introduce the concept of SEA. Note that it can be variously defined and understood. Ask the participants to adopt or adapt a definition that best meets the local situation and requirements.



1

The term Strategic Environmental Assessment (SEA) is variously defined and understood. It refers here to a formal process of systematic analysis of the environmental effects of development policies, plans, programmes and other proposed strategic actions. This process extends the aims and principles of EIA upstream in the decision-making process, beyond the project level and when major alternatives are still open.

SEA represents a proactive approach to integrating environmental considerations into the higher levels of decision making, consistent with the principles outlined in Agenda 21. Often, broader, less detailed assessments are required at these levels compared to project EIA. A comparison of these and other key characteristics of EIA and SEA can be found in Box 1. Both processes have common elements, but increasing modification to procedure and methodology are necessary when moving from the project to the policy level.

To date, only a relatively small number of countries and international organisations have made formal provision for SEA. These frameworks vary, sometimes substantially, and indicate the flexible adaptation of SEA to

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different levels and types of decision-making. As presently institutionalised, SEA is a multi-stage process that encompasses a spectrum of approaches and diverse arrangements, procedures and methods. These include EIA-based environmental appraisal and integrated policy and planning systems, and range in emphasis from assessing the impact of implementing a policy or plan to applying SEA iteratively to build environmental aspects throughout the formulation of a proposed approach.

Despite taking different forms, SEA systems have a common purpose: to take account of environmental concerns in policy and planning decision-making, thereby contributing to sustainable development. However, there are varying interpretations of the role, scope and process of SEA; for example with regard to substantive aims, contribution to environmental protection and sustainable development, inclusion of economic and social factors, and minimum legal and procedural requirements. These issues are reflected in the menu of definitions of SEA outlined in the Annex to this topic, which can be reviewed to identify aspects that are relevant to a given country.

Box 1: Some comparisons between EIA and SEA

EIA of projects

Takes place at end of decision-making cycle

Reactive approach to development proposal

Identifies specific impacts on the environment

Considers limited number of feasible alternatives

Limited review of cumulative effects

Emphasis on mitigating and minimising impacts

Narrow perspective, high level of detail

Well-defined process, clear beginning and end

Focuses on standard agenda, treats symptoms of environmental deterioration

SEA of policy, plans and programmes

Takes place at earlier stages of decision-making cycle

Pro-active approach to development proposals

Also identifies environmental implications, issues of sustainable development

Considers broad range of potential alternatives

Early warning of cumulative effects

Emphasis on meeting environmental objectives, maintaining natural systems

Broad perspective, lower level of detail to provide a vision and overall framework

Multi-stage process, overlapping components, policy level is continuing, iterative

Focuses on sustainability agenda, gets at sources of environmental deterioration

Source: amended from CSIR (1996)



2

Outline the rationale and aims of SEA, and indicate the benefits that might be expected from the implementation of this process in a given country using information gained in the training needs analysis (Topic C). Ask participants to contribute to this review.

The premise of SEA can be simply stated: EIA on its own is not enough. Only a relatively small proportion of the proposals and decisions made by governments are subject to examination. SEA rounds out and scales up the coverage from projects to include policy, plans, programmes and other proposed strategic actions with potentially important environmental effects. This process gets at the *sources* of environmental impacts, rather than treating only the *symptoms* in relation to specific projects (as identified in Box 1).

By doing so, SEA responds to what the Brundtland Commission called 'the chief institutional challenge of the 1990s'. From this perspective, SEA facilitates informed and integrated decision-making through the provision of environmental information at the same time and on par with social and economic aspects. The introduction of SEA has been driven by both procedural and substantive trends and imperatives (see Box 2). Often called the bottom-up and top-down strategies, these are aimed at:

- reinforcing project-level EIA; and
- promoting environmentally sound and sustainable development.

Despite its wide use and acceptance, project EIA has acknowledged shortcomings as a tool for minimising environmental effects of development proposals. It takes place relatively late at the downstream end of the decision-making process, after major alternatives and directions have been chosen. Normally at this stage, the issues have narrowed to how a project should be implemented environmentally, rather than whether, where and what form of development is environmentally appropriate. By addressing these issues upstream in the decision-making process, SEA can help to focus and streamline EIA of any subsequent projects.

More optimally, SEA is a proactive tool to anticipate and prevent environmental damage caused by sector policies and plans enacted by development agencies. A key objective is to provide early warning of large scale and cumulative effects, including those resulting from many smaller-scale actions that otherwise would fall under thresholds for triggering a project EIA. For example, an SEA of a land use plan can take account of biodiversity losses associated with proposed developments, or an SEA of a national road building programme can address the implications for climate warming of increased CO₂ emissions in light of commitments under the Kyoto protocol and against other transport alternatives.

Other potential policy and institutional benefits can be gained from the use of SEA as indicated in Box 3. These derive from but extend beyond the gains that occur when the main aims of SEA are achieved. They centre on changes to the culture of decision-making that are thought to accompany what the World

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Bank refers to as ‘mainstreaming’ the environment, i.e., making it part of the mandate and operation of economic agencies. Such changes are expected to be long term and gradual, but some could be instituted sooner (e.g. meeting obligations of a country under the conventions on biodiversity and climate warming).



3

Box 2: Aims and objectives of SEA

To support informed and integrated decision-making by:

- identifying environmental effects of proposed actions
- considering alternatives, including the best practicable environmental option
- specifying appropriate mitigation measures

To contribute to environmentally sustainable development by:

- anticipating and preventing environmental impacts at source
- early warning of cumulative effects and global risks
- establishing safeguards based on principles of sustainable development

To reinforce project EIA by:

- prior identification of scope of potential impacts and information needs
- addressing strategic issues and considerations related to justification of proposals
- reducing the time and effort necessary to conduct individual reviews

Source: amended from Sadler and Brook, 1998.



4

Box 3: Some wider potential policy and institutional benefits from use of SEA

- mainstreaming environmental objectives
- incorporating sustainability principles into policy-making
- meeting obligations under international environmental agreements
- ‘sustainability assurance’ for development proposals and options
- instituting environmental accountability in sector-specific agencies
- greater transparency and openness in decision-making

Briefly trace the background, evolution and current status of SEA, noting relevant local trends and developments. Ask participants to help identify these.



14-1

SEA trends and developments can be placed in the broader context of EIA history (see Topic 1–Introduction and overview of EIA). Key legal and policy milestones are listed in Handout 14-1. In broad outline, the path of SEA development can be divided into two main phases with a third one imminent.



5

These have been called:

- *the formative stage* – from 1970 to 1989;
- *the formalisation stage* – from 1990 to 2000; and
- *the extension stage* – 2001 onward.

During the *formative stage*, certain legal and policy precedents for SEA were established by the introduction and early implementation of EIA. The US *National Environmental Policy Act* (NEPA, 1969) was intended to apply to 'legislation and other major actions'. For much of this period, however, its scope of application beyond the project level was limited, primarily focused on programmes. In a few other countries, elements of SEA were recognisable in certain EIA processes, for example public inquiries and environmental reviews conducted in Australia and Canada. By the end of the 1980s, other countries and international organisations had begun to make some provision for SEA (see Handout 14-1).

During the *formalisation stage*, SEA systems were established by an increasing number of countries in response to *Agenda 21* and other policy statements on sustainable development. These systems were and still are relatively diversified. Some countries made provision for SEA of policy, plans and programmes separately from EIA legislation and procedure (e.g. Canada, Denmark). Other countries have introduced SEA requirements through environmental appraisal (e.g. UK), in reforms to EIA legislation (e.g. Czech Republic, Slovakia) or as part of resource management or biodiversity conservation regimes (e.g. New Zealand, Australia). Certain lending and development programmes financed by the World Bank became subject to sectoral and regional environmental assessment (EA).

An *extension stage* is set to begin, marked by the widespread adoption and further consolidation of SEA. Key driving forces will be the transposition of the recently concluded European Directive on SEA by member states (to enter into force in 2004) and later by accession countries; and the negotiation of an SEA Protocol to the UNECE Convention on Transboundary EIA by signatory countries (with a provisional date of May 2003 for completion). These and other international legal and policy developments (discussed later) indicate a possible tripling of the number of countries that make provision for SEA over the next decade.

Discuss the scope of application of SEA to different levels of decision-making, including policy, plans and programmes. Ask the group to identify proposed actions that are subject to some form of SEA already or that could benefit from the application of this process.

In principle, SEA can apply to a wide range of proposed actions above the project level. The scope of SEA application and relationship to different levels and types of development decision-making are depicted in Figure 1. It illustrates SEA as a multi-stage process that encompasses policy, plans and programmes (and, in certain jurisdictions, legislative bills and other instruments). These terms mean different things in different countries (see

Box 4), and the scope of application of SEA will be defined by what is understood to be a policy, plan or programme within a particular jurisdiction.

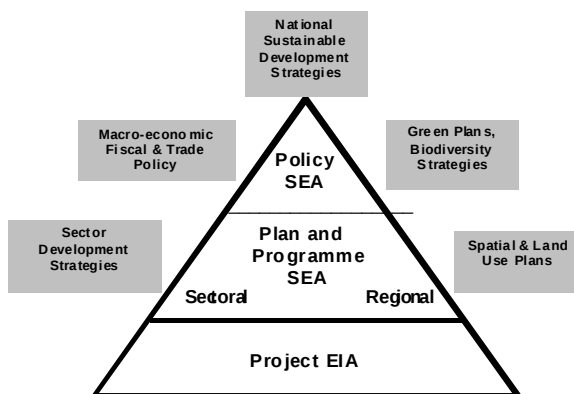
An indicative list of areas covered already by some form of SEA can be found in Box 5. Most attention is given to proposed actions in specific sectors that are known or likely to have significant environmental effects. Examples include energy, transportation and industrial development. Other areas commonly subject to SEA include spatial plans, regional development programmes and resource management strategies. As a rule of thumb, candidate areas for SEA include strategic proposals that concern or affect use of land and natural resources, extraction of raw materials, production of chemicals and other hazardous products, and/or the generation of pollutants, wastes and residuals. These areas continue to be extended.

In practice, the scope of application of SEA is incomplete and highly variable, both across jurisdictions and in relation to areas and processes of decision-making. So far, few if any countries or international organisations have a comprehensive SEA system in place, one that applies to all strategic actions likely to have significant environmental effects. Most commonly, SEA is applied at the level of development plans and programmes. Policy level applications are less common, but arguably even more important for leveraging a change in direction toward environmental protection and sustainable development.

Generally, policies are understood to stand at the apex of a decision-making hierarchy, and guide or set a context for plans and programmes (see Figure 1). An integrated framework may be represented as a logical sequence of proposed actions and linkages. Policies lead to plans and programmes, both sectoral and spatial (e.g. land use plans), some of which, in turn, initiate and fix the location of specific projects and activities. Where this arrangement is in place, it permits a tiered approach to SEA and EIA, in which each stage sets up the next as part of a rolling review of policy, plan and project development.

In many countries, however, this idealised framework may be absent, fragmentary or approximated only partially. More likely, many aspects of policy, plan and programme development will be incremental rather than systematic. How this process operates needs to be understood in order to apply SEA successfully in a given country. In turn, policy, plan and programme development will reflect the prevailing 'political culture', the rules and norms by which decisions are made.

Where SEA is not yet in place or is incomplete, a country may introduce SEA independently or in response to the requirements of multi-lateral financial institutions (see below). In either case, 'mapping' the types and process of decision-making in sectors known to have environmental effects can be instructive. This schematic outline can indicate how SEA might be linked and adapted to the prevailing structure of decision-making, or its role extended. For this exercise, use may be made of materials gathered from the Training Needs Assessment, as well as drawing on the local knowledge of participants.



Source: Sader (1994)

Figure 1: SEA in relationship to other decision-making processes

Box 4: A generic definition of policies, plans and programmes

Often there is no clear distinction between what constitutes a policy, plan or programme. A generic definition is:

- *Policy* – guiding intent, defined goals, objectives and priorities, actual or proposed direction
- *Plan* – strategy or design to carry out a general or particular course of action, incorporating policy ends, options and ways and means to implement them
- *Programme* – schedule of proposed commitments, activities or instruments to be implemented within or by a particular sector or area of policy

In practice, these terms are overlapping and mean different things in different countries. This is especially the case with plans and programmes, which are used interchangeably in many jurisdictions. However, the meaning of these terms only need be understood generically. *For a given country or jurisdiction, the important point is to apply SEA to what is defined or normally considered to be a policy, plan or programme.*

Box 5: Indicative list of areas subject to SEA

- sector-specific policy, plans and programmes
- spatial and land use plans
- regional development programmes
- natural resource management strategies
- legislative and regulatory bills
- investment and lending activities
- international aid and development assistance
- structural adjustment funds and operations
- macro-economic policy



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- budgets and fiscal plans
- international trade agreements

Source: amended from Partidario (2001)

Summarise principles and elements for SEA good practice, and discuss their relevance for local use and application.



14-2

SEA takes place under a diverse set of arrangements and decision-making contexts. There is no single model of or best approach to SEA. Instead, a number of general principles of SEA good practice have been drafted, which apply to and underpin the different forms of SEA noted previously. The guidelines described below were developed through the international study of EA effectiveness, and have been subject to further review by SEA administrators and practitioners at international workshops (see Handout 14-2 for a more detailed list).



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A hierarchy of principles can be identified, based upon the EIA core values and principles described in Topic 1 – *Introduction and overview of EIA*. The basic principles for effective EIA issued by the International Association for Impact Assessment (IAIA) are understood to apply to SEA, but to require further elaboration to take account of their differences as indicated earlier in Box 1. Guiding principles for SEA process design and implementation are described in Box 6 below. They lead toward identification of performance criteria for the conduct and administration of SEA (currently being developed by an IAIA working group, see www.iaia.org).



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Enabling conditions for meeting these guiding principles are established through appropriate institutional arrangements. These include:

- clear legal or administrative/policy mandate;
- explicit scope of application to decision-making;
- requirements and responsibilities for compliance;
- guidance on procedure and process to be followed;
- provision for administrative oversight; and
- mechanisms for quality control, including review of SEA implementation and outcomes.

When introducing or strengthening these arrangements, a number of ‘factors’ can contribute to their successful implementation. The following ‘reality checks’ can be made based on lessons from international experience:



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- promote SEA as a bonus not a burden;
- encourage creativity and innovation;
- tailor the approach to the requirements of decision makers;
- provide start-up help and assistance wherever possible;
- build a knowledge base through ‘hands on’ experience; and
- learn by doing when applying new methods and procedures.

Further guidance on applying the principles listed in Box 6 is provided by



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operational rules of thumb for SEA good practice. These include:

- begin as early as practicable in the process of policy or plan formulation;
- keep in mind that the purpose of SEA is to inform decisions not to produce a study;
- provide the right information at the right time for decision-making;
- focus on the comparison of major alternatives;
- carry out an appropriate form of analysis – impact assessment or policy appraisal;
- use the simplest procedures and methods consistent with the task;
- look to gain environmental benefits as well avoid adverse impacts; and
- review and document the outcomes of the SEA process.

Box 6: Guiding principles for SEA process design and implementation

- *fit-for-purpose* – the SEA process should be customised to the context and characteristics of policy and plan making
- *objectives-led* – the SEA process should be undertaken with reference to environmental goals and priorities
- *sustainability-driven* – the SEA process should identify how development options and proposals contribute toward environmentally sustainable development
- *comprehensive scope* – the SEA process should cover all levels and types of decision-making likely to have significant environmental and health effects
- *decision-relevant* – the SEA process should focus on the issues and information that matter in decision-making
- *integrated* – the SEA process should include consideration of social, health and other effects as appropriate and necessary (e.g. if equivalent processes are absent)
- *transparent* – the SEA process should have clear, easily understood requirements and procedures
- *participative* – the SEA process should provide for an appropriate level of public information and involvement
- *accountable* – the SEA process should be carried out fairly, impartially and professionally having regard to the requirements in force and internationally accepted standards, and subject to independent oversight and review
- *cost-effective* – the SEA process should achieve its objectives within limits of available policy, information, time and resources

Source: Sadler and Verheem, 1996; Sadler and Brook, 1998.

End of Topic 14 Part 1

Topic 14
Strategic
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Assessment

Topic 14 Part 2

Introduce the second section of Topic 14, which covers institutional arrangements, procedures and methods for carrying out SEA and some future directions. Begin the session by outlining the different types of provision that are made for SEA and the pros and cons of the institutional arrangements that are in force. Consider which framework(s) might be adapted when introducing SEA in a given country, and note any barriers which may stand in the way.



14-3

A number of countries and international organisations have made formal provision for some type of SEA or a near equivalent process. The legal and administrative arrangements for SEA vary in mandate, scope, elements of procedure and relationship to decision-making. Using these points of reference, a comparison of different types of institutional frameworks can be found in Handout 14-3. The examples are illustrative rather than definitive. However, the countries and international organisations listed have relatively well-established SEA systems (or, in the case of the European Directive, can be expected to be important in extending and consolidating formal arrangements).

Four main points stand out from the description of SEA institutional frameworks in Handout 14-3:



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Formal provision for SEA is made through both law and policy.

EIA legislation mandates the SEA process in some countries. Where separate provision is made for SEA, it is usually through administrative order or policy directive (although this proportion will change when the European SEA Directive comes into force). A few countries have more than one type of provision for SEA and/or have integrated the process within a resource management, land use or development planning system.

There is limited coverage of policy proposals and draft legislation.

Policy level SEA systems apply to high-level processes of decision-making (e.g. submissions to Cabinet and Parliament). In some countries, they are characterised by minimal procedure and flexible implementation. In others, EIA-based legislation applies specifically or implicitly to policy (although it is not always implemented. However, this situation may be changing as the listing of recent developments in Handout 14-1 indicates).

Plan and programme level SEA systems are based mainly on or correspond to EIA provision and procedure.

The areas and sectors subject to review may be defined generally or listed specifically (e.g. plans and programmes that initiate or fix the type and location of specific projects). Appraisal-based systems are closely related but applied as an integral, iterative part of the plan-making process, rather than as a separate, formalised procedure.

SEA arrangements are diversified, far more than those in place for EIA.

Five types of SEA systems may be recognised in the institutional frameworks outlined in Box 7. These define a range of options for possible consideration

by countries that currently have no formal provision for SEA but are moving in that direction or intend to strengthen existing SEA process elements.

Other countries, states in federal jurisdictions and international organisations, additional to those listed in Box 7 and Handout 14–3, have established SEA systems at an equivalent level. Many more, including transitional and developing countries have some experience of SEA or related areas and aspects. Examples include domestic processes of sector and spatial planning, or preparing national environmental action plans, environmental overviews or other reports required as part of international lending and assistance activities.

A SWOT analysis of these processes and their institutional strengths, weaknesses, opportunities and threats can supplement information from the training needs analysis and decision mapping (described in Part 1 of this Topic). This analysis could indicate the most appropriate arrangements for:

- introducing SEA within a given country, which may be different from those arrangements in force for EIA, or what is required elsewhere; or
- alternative or equivalent means of integrating environmental considerations into policy and plan-making.

Box 7: Different types or institutional models of SEA systems

- *EIA-based: SEA* – carried out under EIA legislation (e.g. Netherlands) or as separately administered but related procedure (e.g. Canada)
- *Environmental appraisal* – SEA provision is made through a comparable, less formalised process of policy and plan appraisal (e.g. UK)
- *Dual-track system* – SEA arrangements are differentiated and implemented as separate processes (e.g. the Netherlands' environmental test (or appraisal) of legislation and SEIA of specified plans and programmes)
- *Integrated policy and planning system* – SEA elements are part of effects-based policy and plan-making (e.g. New Zealand)
- *Sustainability appraisal* – SEA elements are replaced by integrated (environmental, economic and social) assessment and review of major policy and planning issues (e.g. Australia, Resource Assessment Commission, now disbanded, and UK sustainability plans, now being rolled out)

Now describe the main forms of SEA of policy, plans and programmes, emphasising those that are most relevant to the issues and realities in a given country. Ask the participants how chosen forms could be modified and adapted to purpose.

The institutional arrangements described above incorporate a number of different forms of SEA. A differentiated, rather than 'one-size-fits-all', approach is taken to address the levels and types of strategic decision-making described in Part 1 of this Topic (refer back to Figure 1). The main, generic forms of SEA are described in Box 8, comprising policy, spatial plan and sector-specific programmes. Particular reference is made to SEA instruments that are used already or may be potentially applicable in many developing



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countries. Further information on SEA practice and experience in these areas can be found in the companion volume (*Environmental Impact Assessment and Strategic Environmental Assessment: Towards an Integrated Approach*).



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Box 8: Generic forms of SEA of policies, plans and/or programmes

- *Policy SEA* – review of proposed government actions and options at the broadest level; includes potentially wide range of decisions in the form of guidelines, statements, position papers, legislation and strategies relating to specific sectors (e.g. national energy policy) or applying government wide (e.g. privatisation, trade liberalisation); and can be extended to audit or reassessment of long established policies that have adverse environmental effects (e.g. agricultural subsidies).
- *Sector plan and programme SEA* – review of a development or investment programme for a particular sector (e.g. energy, transport or agriculture); includes evaluation and comparison of the environmental effects of major alternatives (e.g. demand versus supply measures and mix of fuel sources for power generation); and can be extended to any series of projects that, when grouped together (e.g. by stage of technology), can have potential cumulative effects.
- *Spatial plan and regional SEA* – review of multi-sector development or investment programme for a particular region (e.g. river basin, coastal zone or urban area) or a land use plan for an officially designated area; includes evaluation and comparison of the environmental effects of alternative strategies and measures for plan implementation; and can be extended to regional or ecosystem assessment of cumulative effects on resource potentials, biodiversity or other aspects of natural capital stock.

Sources: adapted from Goodland (1998); World Bank (1993; 1996).



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Policy SEA

Policy proposals – whether stated or enacted in law – are the most critical point of entry for SEA to influence the course of development. However, law and policy development traditionally is given little or no external scrutiny, and SEA has proven difficult to apply at the highest level. This tradition is deeply rooted in the structure of political power and often reinforced by constitutional conventions, such as Cabinet secrecy. Political will or acceptance is a prerequisite for the application of policy level SEA.

In addition, policy-making processes are not necessarily straightforward. Aspects to watch for when considering the way forward for SEA include the following:

- Many policies evolve in an incremental and non-systematic fashion, or are defined by standing practices. In these cases, an environmental policy audit may be more suitable than an SEA.
- Often, policies in sectors known to have environmental effects are formulated in isolation or with little reference to their relationship to other areas (e.g. transport and energy). In these cases, SEA may need to consider

the effects across policy boundaries, noting any inconsistencies.

- Policy outcomes can be highly uncertain, affected by many intervening factors. In these cases, SEA can address significant environmental *implications* and *issues*, rather than impacts *per se* (which can be clarified later by tracking policy implementation).
- Environmental concerns often do not weigh heavily on major policy initiatives, which may be off-limits to SEA or subject only to limited review. In these cases, SEA still can help to mitigate the effects of their implementation (e.g. conclusion of an side agreement on environmental cooperation under the North American Free Trade Agreement).

These points also help explain why certain countries have instituted policy-level SEA on a non-statutory basis, using minimal or modified procedure to review legislative and other government proposals. For example, in the Canadian, Danish and Dutch systems, SEA of policy and legislative proposals is broad and qualitative, with relatively brief documentation of environmental effects. In these countries, the SEA process is also connected to the highest levels of political decision-making. Recent guidance issued as part of reforms to Canada's process calls for SEA to be linked more closely to the sustainable development strategies prepared by federal agencies.

More formalised procedure based on EIA legislation can be appropriate if policies are detailed and formulated by a systematic and transparent process. The procedure followed corresponds more to plan and programme assessment, including detailed analysis and greater public input. This approach is applied in certain transitional countries (e.g. Czech Republic, Poland, Slovakia) and may have wider application in Central and Eastern Europe. With certain adaptations, a similar approach to SEA of policy may be used by developing countries with centralised structures of decision-making (as suggested by SEA developments and capacity building activities taking place in China and Vietnam).

Sector plan and programme SEA

SEA of plans and programmes proposed for specific sectors is a long-standing process. It has been applied in the USA for more than twenty years at both federal and state levels (although the NEPA process is reported to be still under-used at the programmatic level). A number of other countries also have considerable experience with this form of SEA, including the Netherlands where it is mandatory for sector (and spatial) plans and programmes listed in the EIA Decree (e.g. waste management, electricity generation, drinking water supply). The European Directive includes a larger number of sectors that either automatically require or may be subject to SEA.

Internationally, the World Bank has made increasing use of what it defines as sectoral EA, broadly commensurate with the trend towards more broadly based programmatic lending (e.g. structural adjustment funds). Typically, this form of SEA is prepared for plans and programmes that finance a number of sub-projects. It has been applied to the road, water, power, agriculture and urban development sectors in all major regions of Bank operations. Some borrowing countries have carried out SEA for a number of Bank financed



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programmes (e.g. India) but it has been little used in other regions (e.g. Sub-Saharan Africa).

Experience to date indicates that SEA usually takes place after the scope and objectives of a plan or program are defined. So far, it has played a limited role in consideration of alternative investments, and, in some cases, an SEA is prepared only when a plan or program has been finalised and project priorities are defined. Terms of Reference for sectoral EA suggest its use is intended primarily to establish a framework for EIA at the sub-project level, and secondarily to identify significant environmental issues and any policy and institutional measures to address them. In practice, sectoral EA is less effective in meeting the second objective.

Other approaches that are used by or relevant to developing countries include the environmental overview, which is applied internally by UNDP, and what is termed Strategic Environmental Analysis (SEAN), now used by the Netherlands Development Organisation. The environmental overview is a flexible tool that is reported to be effective in assisting with the rapid formulation of a range of sector assistance programmes. It is also seen as having the potential to work at other levels and in varied settings. SEAN is a more comprehensive and participatory approach to strategic planning, which so far has been applied mainly at the regional level in developing countries (described below).



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Spatial plan or regional SEA

SEA of spatial or land use plans also dates back to the formative phase of EIA in the USA. Federal land use plans to which NEPA applies include those prepared for multi-purpose public lands, national forests and wildlife management zones, as well as for national parks and other strictly protected areas. In California, SEA applies to many types of spatial plans, including those prepared for cities and counties and for regional transportation, infrastructure, parks and waste disposal. Similar SEA processes are in place elsewhere, including the UK, for development plans at the county level, and the Netherlands for regional waste management and urban development plans. The European Directive on SEA also applies to spatial plans.

Land use plans prepared for officially designated areas are usually undertaken by a prescribed or defined procedure and the integration of SEA is relatively straightforward. In the UK, for example, SEA or environmental appraisal is used to inform each stage of plan-making. This process assesses environmental effects iteratively rather than only at the draft stage or with regard to plan implementation. It is intended to lead toward sustainable development by assessing the effect of plan objectives, alternatives and proposals on global change, natural resources and local environmental quality (and is now backed by a new wave of sustainability based regional plans).

Internationally, the Regional Environmental Assessments (REA) carried out for World Bank financed investment programmes correspond to SEA of spatial plans. REA is intended to apply to investment programmes for a particular region, such as a watershed or coastal zone. This approach is used where a number of development activities with potentially significant

cumulative effects are planned for the same area (normally defined by physical or ecological boundaries). In such cases, an REA can have major advantages over individual project EIAs. So far, however, experience with REA has been limited by comparison to the number and types of sector EA reported above.

Other approaches used by or relevant to certain developing countries include:

- *SEA of regional development plans (RDP)* – required by the European Union as part of the programme by which accession countries of Central and Eastern Europe achieve social and economic cohesion. There are similar requirements for EU structural funds as set out in *Handbook on Environmental Assessment of Regional Development Plans and Structural Funds* (<http://europa.eu.int/comm/environment/eia/home.htm>).
- *SEA of spatial and regional plans as part of bilateral assistance* – some limited and informal use was reported by the OECD Working Party on Development Assistance and Environment. Some of the reviews of development cooperation carried out by the Netherlands EIA Commission, for the Ministry of Foreign Affairs, are of this type.
- *SEAN process to formulate sustainable development plans and strategy* – applied formally and informally to support broad, decentralised processes in a number of countries and spatial contexts. A web site gives updated information on the process and its applications for potential users (<http://www.seanplatform.org>).
- *SEA of district and territorial development plans in Hong Kong SAR* – a number of these have been completed in accordance with an executive directive. Of particular interest may be the SEA of the medium and long-term land use and growth strategy for Hong Kong (<http://www.info.gov.hk/epd>).
- *SEA related to biodiversity* – the Secretariats of both the Biodiversity and Ramsar conventions have called for the use and development of SEA at an ecosystem level as an implementing mechanism. In the interim, conservation organisations have carried out biodiversity assessments and SEA of regional plans affecting wetland and other habitats.

Review the procedures and methods that are or can be used to carry out an SEA, drawing attention to the different approaches that may be necessary to cover the full range of strategic decisions. Ask participants to identify the key steps of SEA practice that are appropriate locally, modifying them as necessary.

During the last decade, considerable experience with SEA practice has been gained in different countries. In many cases, the procedure and methods used in SEA are the same as in EIA. Notable examples include plans and programmes that have a direct relationship to projects or land use change. However, EIA-based procedures and methods still may need to be modified to take account of greater uncertainty about potential effects, compared to project-specific proposals. For broader policies, which have environmental effects that are indirect or attenuated, less formal, more flexible appraisal procedure and methods can be appropriate (an example is given in Box 9).

EIA and appraisal-based SEA processes are overlapping and include common procedural elements. These can be illustrated by comparing the steps outlined in Boxes 10 and 11. For example, both processes include provision for scoping, consideration of alternatives and mitigation of environmental effects. They also diverge in certain respects; examples include explicit requirements for public involvement and the information to be provided in an EIA-based SEA (Box 10) and the emphasis on clarifying trade-offs and constraints in an environmental appraisal (Box 11).

A range of methods can be used to carry out an SEA. These are drawn from both EIA and policy appraisal/plan evaluation. With various adaptations, a number of methods have been applied successfully in SEA practice already. Some examples are listed in Box 12, together with their relevance for key stages of the SEA. Generally, the tools used in SEA tend to be relatively simple and easy to apply (e.g. checklists and matrices), although more advanced predictive methods can be employed if circumstances warrant (e.g. traffic simulation models of road building programme) and multi-criteria analysis can assist in clarify the trade-offs and comparisons among alternatives.

In all cases, an SEA should be carried out systematically. The following principles of good practice have particular reference to conducting a systematic analysis (see also Topic 1 – *Introduction and overview of EIA*):

- rigour – SEA should apply the 'best practicable' methodologies to address the impacts and issues being investigated;
- practicality – SEA should identify measures for impact mitigation that work best at this level; and
- credibility – SEA should be carried out with professionalism, objectivity, impartiality and balance.

Other supporting elements also need to be in place for SEA to be carried out systematically, as indicated above. These include:

- baseline or background information – to help identify the potential environmental effects of the proposed strategic action (use may be made of data gathered for other purposes, e.g. state of the environment reports);
- headline indicators – to permit evaluation of whether or not environmental protection objectives are being met or if proposed strategic actions are likely to lead to unacceptable change; and
- policy frameworks – to facilitate trade-offs and consideration of alternatives in relation to environmental and sustainability requirements

and commitments established by a country or international organisation.

Box 9: Example of minimum process and procedure– the Netherlands E-test

<i>Screening/scoping phase</i>	Interdepartmental working group identifies proposals to be tested and issues to be examined
<i>Analysis/ documentation phase</i>	E-test carried out by the responsible Ministry, with assistance of the Joint Support Centre, and results documented in an Explanatory Memorandum to the draft legislation
<i>Review/submission phase</i>	Joint Support Centre, in co-operation with the Ministry of Justice, reviews the quality of the information in the memorandum to determine if the draft can be submitted to the Council of Ministers

Source: Verheem and Tonk (2000)

Box 10: Carrying out an EIA-based SEA (also called Strategic Environmental Impact Assessment [SEIA])

The conduct of an SEIA can include some or all of the following steps:

- *screening* – to determine whether or not an SEA is needed and at what levels
- *scoping* – to identify key issues and alternatives, clarify objectives and develop terms of reference for SEA
- *identification and comparison of alternatives* including no action – to clarify implications and trade-offs
- *inform and involve the public* – to identify the views and concerns held by stakeholders
- *analyse and evaluate the impacts* – to identify the significant effects of selected alternatives and measures for mitigation and follow-up
- *document the findings* – to provide the information that is needed for decision-making and/or to comply with legal requirements (as in the European Directive)
- *review the quality of the information* – to ensure it is clear, sufficient and relevant to the decision being taken
- *carry out follow up* measures as necessary – to monitor effects, check on implementation, and track any arrangements for subsidiary SEA or EIA

Source: adapted from UNECE (1992).



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Box 11: Carrying out a strategic environmental appraisal

- The conduct of an appraisal-based SEA can include some or all of the following steps:

 - *list the objectives* of the proposal and *summarise the policy issue*, identifying possible trade-offs and constraints
 - *specify the range of options* for achieving the objectives, including the ‘do nothing’ option
 - *identify and list all environmental impacts, issues and implications* and consider mitigation measures to offset them
 - *assess their significance* and importance in relation to other effects
 - *quantify costs and benefits* where possible and appropriate (i.e. without disproportionate effort)
 - *value costs and benefits*, using an appropriate method including those based on monetary values, ranking or physical quantities
 - *state the preferred option* with reasons for doing so
 - *monitor and evaluate* the results, making appropriate arrangements for doing so as early as possible
 - *consider how the appraisal will be publicised*

Source: adapted from UK Department of Environment, Transport and the Regions (1998)



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Box 12: Examples of methods and their usage in SEA

Step	Examples of methods
Baseline Study	SOE reports and similar documents Inventory of environmental stock/setting ‘Points of reference’ from comparable studies
Screening/Scoping	Formal/informal checklists Survey, case comparison Effects networks Public or expert consultation
Formulating options	Environmental policy, standards, strategies Prior commitments/ precedents Regional/local plans Public values and preferences
Impact analysis	Scenario development Risk assessment Environmental indicators and criteria Policy impact matrix Predictive and simulation models

	GIS, capacity/habitat analysis
	Benefit/cost analysis and other economic valuation techniques
	Multi-criteria analysis
Documentation for decision-making	Cross-impact matrices
	Consistency analysis
	Sensitivity analysis
	Decision 'trees'
<i>Source: Sadler and Verheem (1996).</i>	

Briefly consider future directions for SEA development, noting how it might be used as a tool for assessing the sustainability of proposals. Discuss the practicalities of such an approach locally.

There is increasing discussion of the use of SEA as an instrument to review the sustainability of development proposals, rather than merely to minimise the impact of policy, plan and programme decisions. Although this aspect is reflected in the aims and principles of SEA, it is not always evident in practice. In many cases, there is token reference to sustainability, rather than serious consideration of whether proposals are leading toward or away from this goal. This concern reflects both the difficulties encountered in defining sustainability, and the fluid state of SEA process development.

Looking ahead, future directions for SEA as a sustainability instrument can follow two routes (see also Topic 15 – *Future directions*). One route leads towards refocusing SEA as a process for environmental sustainability assurance of policy and plan making, checking that proposed actions are consistent with key measures and safeguards. Box 13 outlines a set of generic questions for this purpose, indicating how sustainability tests might be framed at different stages of the SEA process. The other route involves repositioning SEA as a stepping-stone or transitional process that leads toward 'sustainability appraisal' or integrated assessment of environmental, economic and social effects of policy, plan and programme proposals.

Eventually, it is likely that both directions will converge. What is not yet clear is the time frame by which countries can realistically achieve an integrated approach. Some critics prefer to press toward sustainability appraisal. Others argue that a separate SEA process will be needed for the foreseeable future to ensure environmental considerations are fully represented in the decision-making mainstream. This debate will differ in given countries, bearing in mind that many have yet to introduce SEA systems or elements in any form.

Further discussion of these issues can be found in the companion volume (*Environmental Impact Assessment and Strategic Environmental Assessment: Towards an Integrated Approach*).

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Box 13: Using SEA to test for sustainability assurance

Stage of SEA	Sustainability test	Key questions
Screening	Direction toward requirements	Is the proposal consistent with sustainability policies? What are the environmental <i>implications</i> in this regard?
Scoping	Distance to target	How does the proposal measure up against key indicators? What are the significant environmental <i>issues</i> in this regard?
Significance	Determination of significance	What are the environmental <i>impacts</i> of the proposal? How significant are they with reference to sustainability policies and criteria?

Source: Sadler, (1999)

Undertake a training activity to reinforce the topic, if appropriate, focusing on local requirements and priorities for SEA 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 and previewing the next topic.

Reference list

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SEA of District and Territorial Development Plans in Hong Kong SAR.
<http://www.info.gov.hk/epd>

SEAN process to formulate sustainable development plans and strategy.
<http://www.seanplatform.org>

Annex 1: Some definitions of SEA

There is no uniformly accepted definition of SEA. Five examples are given below, which describe SEA:

- with and without reference to EIA procedure [1,2];
- by referring to accountable decision-making [1,3] or by specifying a duty of care for the environment [5];
- as taking place at the earliest appropriate stage of decision-making [2,3];
- to include environmental consequences on par and simultaneously with economic and social factors [2], to holistically understand environmental and social factors [4], or to ensure environment, economic and social factors are integrated [3]; and
- as delivering environmental protection and sustainable development objectives and policies [5] or expanding the policy focus beyond immediate concerns [4].

[1] 'The formalised, systematic and comprehensive process of evaluating the environmental impacts of a policy, plan or programme and its alternatives, including the preparation of a written report on the findings of that evaluation, and using the findings in publicly accountable decision-making'. (Therivel, et al, 1992)

[2] 'A systematic process for evaluating the environmental consequences of proposed policy, plan or programme initiatives in order to ensure they are fully included and appropriately addressed at the earliest appropriate stage of decision-making on par with economic and social considerations'. (Sadler & Verheem, 1996)

[3] 'A systematic, on-going process for evaluating, at the earliest appropriate stage of publicly accountable decision-making, the environmental quality and consequences of alternative visions and development intentions incorporated in policy, planning or programme initiatives, ensuring full integration of relevant biophysical, economic, social and political considerations'. (Partidario, 1999)

[4] 'A process directed at providing the authority responsible for policy development (the "proponent" during policy formulation) and the decision-maker (at the point of policy approval) with a holistic understanding of the environmental and social implications of the policy proposal, expanding the focus well beyond the issues that were the original driving force for new policy'. (Brown and Therivel, 2000)

[5] 'A process to systematically analyse and document the environmental effects and consequences of proposed strategic actions (e.g. policy, plan, programme, legislation) and alternatives, including measures to mitigate significant adverse environmental effects and enhance positive aspects, and ensure that the relevant findings are taken into account as an integral part of decision-making, consistent with a duty of care for the environment and with specific reference to the objectives, principles and policies for environmental protection and sustainable development that apply within the jurisdiction concerned'. (Sadler, 2001)

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

- 14–1 SEA can apply to a wide range of proposed actions at the policy, plan and programme level. What types of strategic issues and impacts are associated with development proposals locally? How could these benefit from the application of SEA?
- 14–2 What provisions, potentials and capacities exist for undertaking SEA? How can these be developed? Are there appropriate arrangements on which the use of SEA can be based?
- 14–3 What should be the scope of SEA? Should the SEA process aim for comprehensive coverage or apply only to plans and programmes?
- 14–4 What type of SEA process is best adapted to local decision-making? Should this be the same as or different from the EIA process?
- 14–5 Which procedures and methods will be most useful and effective? What needs to be done to strengthen or improve their application?
- 14–6 How can major alternatives be identified and compared in SEA? What information needs to be gathered for this purpose?
- 14–7 What role can or should the public have in SEA? How might stakeholders be involved constructively in this process?

Speaker themes

- 14–1 Invite a speaker who is knowledgeable about SEA (or a related process) to discuss its aims, benefits and key elements. The presentation should be followed by an open discussion of how the aims and benefits of SEA can be best realised locally.
 - 14–2 Invite a speaker who has experience with SEA practice to review the process step-by-step and discuss the procedures that apply. The presentation should be supported by examples of process implementation that are relevant to the local situation.
 - 14–3 Invite a speaker who has an understanding of SEA methods to review how they work and what they can be used for. Ensure that some of the discussion covers the data requirements for the method and that note is made of any limitations.
-

Group Activity 14–1: Establishing an SEA process

Title: Making formal provision and arrangements for SEA

Aim: To gain an appreciation of how an SEA process could be introduced or strengthened in accordance with local requirements and international trends.

Group size: Four to six people

Duration: Half to one day, depending on the desired level of detail.

Resources required:

- ☐ Background information on planning and policy-making processes used locally.
- ☐ Copies of Handout 14-1.

Description of activity:

- ☐ Get the group as a whole to determine the scope of the SEA process that should apply locally (e.g. to cover policy, plans and programmes or only certain aspects).
 - ☐ Using Handout 14-1, assign each group the task of identifying/adapting a shortlist of the provisions and arrangements that could be used to introduce or strengthen SEA.
 - ☐ Assemble the group as a whole and ask each small group to summarise its findings, noting any problems that were encountered, the provisions and arrangements that were identified.
-

Group Activity 14-2: Identifying key issues and alternatives

Title: Scoping a development plan (or programme)

Aim: To understand how scoping procedure can be used to identify the key issues and alternatives to be included in an SEA of a development proposal.

Group size: Four to six people

Duration: Half to one day, depending on the desired level of detail.

Resources required:

- ☐ Background information from a local development plan, either for a sector or area, including the environmental and sustainability objectives that are part of the plan or might be affected by it.
- ☐ Copies of OHP 26, focusing on issues related to the proposed plan at the *screening*, *scoping* and *significance* stages.
- ☐ Summary of relevant aspects of Topic 4 – *Screening*, Topic 5 – *Scoping* and Topic 6 – *Impact Analysis (Evaluation)*.

Description of activity:

- ☐ Get the group as a whole to review the development plan to identify a shortlist of key environmental issues and impacts that are likely to occur as result of its implementation.
- ☐ Assign each group the task of drawing up terms of reference for an SEA, including the main alternatives that should be considered.
- ☐ Assemble the group as a whole and ask each small group to summarise its findings, noting any problems that were encountered, the scope and contents of terms of reference and the range.



1

What is SEA?

- systematic, transparent process
- instrument for decision-making
- addresses environmental effects of strategic proposals
- includes policy, plans and programme decisions
- undertaken when alternatives are still open
- applies EIA aims and principles
- flexible, diversified process



2

Why is SEA important?

- EIA of projects insufficient by itself
- effects of strategic decisions not assessed
- SEA rounds out coverage to this level
- gets at sources of environmental impacts
- responds to sustainable development agenda



3

Key aims and objectives of SEA are to:

- facilitate informed decision-making
- contribute to environmentally sound and sustainable development
- identify and address cumulative effects
- supplement and reinforce project-level EIA by:
 - clarification of scope and context
 - reducing the time and effort for review



4

Wider potential policy and institutional benefits of SEA include:

- mainstreaming the environment
- incorporating sustainability principles into policy-making
- meeting international obligations
- 'sustainability assurance' of development proposals
- environmental accountability in sector-specific agencies
- greater transparency and openness in decision-making



5

SEA trends and developments

- limited development and implementation to 1990
- formalisation and diversification in 1990s
- increasing number of countries establish SEA
- response to sustainability agenda
- entering expansion and consolidation phase
- pending international & supra-national arrangements
- more developing countries expected to take up SEA



6

Indicative list of areas subject to SEA

- sector-specific policy, plans and programmes
- spatial and land use plans
- regional development programmes
- natural resource management strategies
- legislative and regulatory bills
- investment and lending activities
- international aid and development assistant



7 & 8

Guiding principles for SEA process design and implementation

- *fit-for-purpose* – customise to decision-making
- *objectives-led* – identify environmental goals & priorities
- *sustainability-driven* – ensure proposal promotes sustainable development
- *comprehensive scope* – cover policies, plans & programmes
- *decision-relevant* – focus on issues that matter
- *integrated* – include social, health effects
- *transparent* – clear, easy to understand requirements
- *participative* – provide for public information and involvement
- *accountable* – implement fairly, impartially & professionally
- *cost-effective* – meet objectives within time and budget limits



9

Institutional conditions that enable SEA good practice

- clear legal or policy mandate
- explicit scope of application
- requirements for compliance
- guidance on procedure and process
- provision for administrative oversight
- quality control mechanisms



10

Some success factors in SEA practice

- promote SEA as a bonus not a burden
- encourage creativity and innovation
- tailor the approach to the needs of decision makers
- provide start-up help
- build a knowledge base from case experience
- learn by doing when applying methods and procedures



11 & 12

Operational rules of thumb for applying SEA guiding principles

- begin as early as practicable
- purpose is to inform decisions not produce a study
- provide the right information at the right time
- focus on comparison of major alternatives
- carry out an appropriate level and type of analysis
- use the simplest procedures and methods consistent with the task
- try to gain environmental benefits as well avoid adverse impacts
- review and document the outcomes of the SEA process



13

Institutional arrangements for SEA

- type of provision for SEA differs
- formalised in both law and policy
- vary in scope, role and relationship to decision-making
- limited development at policy level
- non-statutory, flexible, informal procedure
- greater development at plan/ programme level
- SEA systems diversified compared to EIA



14

Different types of SEA systems

- EIA-based – part of EIA law or separate procedure
- environmental appraisal – comparable, less formalised process
- dual-track – separate processes operated
- integrated policy and planning – SEA part of policy and plan-making
- sustainability appraisal – integrated assessment and review



15

Main forms of SEA

- Policy SEA – applies to highest level proposals
- Sector plan and programme SEA – applies to proposals for specific sector
- Spatial plan and regional SEA – applies to land use proposals for particular region



16

Policy SEA

- critical lever to influence development
- SEA difficult to apply at policy level
- often political and bureaucratic resistance
- policy-making itself not straightforward
- SEA needs to be adapted to process
- few countries make provision for policy SEA
- early adoption of non-statutory, minimum procedure
- policy SEA now legislated in some countries



17

Sector plan and programme SEA

- most developed form of SEA
- will be extended by European Directive
- sector EA applied to World Bank financed programmes
- carried out by borrowing countries
- use and scope of application increasing
- mainly applied to establish framework for EIA of sub-projects
- potential lies in evaluation of major alternatives
- other approaches also relevant to developing countries



18 & 19

Spatial plan and regional SEA

- long established form of SEA, e.g. in USA
- applies to land use plans for designated areas
- spatial planning is a systematic, transparent process
- easily integrated with SEA
- regional EA (REA) promoted by World Bank
- use limited compared to sector EA
- applies to group of sub-projects for a geographic area
- provides framework for analysing cumulative effects
- other approaches also relevant to developing countries



20 & 21

Carrying out a strategic environmental impact assessment (SEIA)

- *screening* – whether and what level of review is needed?
- *scoping* – what are the key issues and alternatives?

- *identification & comparison of alternatives* – what are the implications & trade-offs?
- *inform & involve the public* – what are the views & concerns?
- *analyse and evaluate the impacts* – what are the main effects, how can they be mitigated?
- *document the findings* – what information is needed for decision-making?
- *review the quality of the information* – is it clear and sufficient for this purpose?
- *carry out follow up* – are agreed measures being implemented?



22 & 23

Carrying out a strategic environmental appraisal

- *list the objectives of the proposal* – what does it aim to achieve?
 - *describe the alternatives* – what are options can achieve the objectives?
 - *identify environmental impacts, issues and implications* – what are the effects, how can they be mitigated?
 - *assess their significance* – how important are they?
 - *quantify costs and benefits* – how can this be done?
 - *value costs and benefits* – which method(s) can be used?
 - *state the preferred option* – what are the reasons?
 - *monitor and evaluate the results* – what arrangements are in place?
-



24 & 25

Some examples of methods and their usage in SEA

Step	Examples of methods
Baseline Study	SOE reports and similar documents Environmental stock/setting 'Points of reference'
Screening/Scoping	Formal/informal checklists Survey, case comparison Effects networks Public or expert consultation
Formulating Options	Environmental policy, standards, strategies Prior commitments/ precedents Regional/local plans Public values and preferences
Impact Analysis	Scenario development Risk assessment Environmental indicators and criteria Policy impact matrix Predictive and simulation models GIS, capacity/habitat analysis Benefit/cost analysis and other economic valuation Multicriteria analysis
Documentation for Decision Making	Cross-impact matrices Consistency analysis Sensitivity analysis Decision 'trees'

Using SEA to test for sustainability assurance



26

Stage of SEA	Sustainability Test	Key Questions
Screening	Direction toward requirements	Is the proposal consistent with sustainability policies? What are the environmental <u>implications</u> in this regard?
Scoping	Distance to target	How does the proposal measure up against key indicators? What are the significant environmental <u>issues</u> in this regard?
Significance	Determination of significance	What are the environmental <u>impacts</u> of the proposal? How significant are they with reference to sustainability policies and criteria?

Topic 14
Strategic
Environmental
Assessment

SEA and legal policy developments

SEA legal and policy developments

- 1970 U.S. *National Environmental Policy Act* (1969) – requires ‘proposals for legislation and other major federal actions significantly affecting the...environment’ to include a ‘detailed statement on the environmental impact’ (Sec. 102 (2)(c));
- California Environmental Quality Act* – modelled after NEPA and applies to activities proposed or approved by state agencies, including programmes, plans & staged projects (Guidelines Sec. 15165 - 15168)
- mid- Public inquiries and environmental reviews of major proposals – consideration of
1970s policy issues (e.g. Mackenzie Valley Pipeline Inquiry, Canada, 1974-1977, Ranger Uranium Environmental Inquiry, Australia, 1975-1977)
- 1978 NEPA *Regulations* issued by Council on Environmental Quality – specify actions subject to programmatic EIS as those that can be grouped generically, geographically or by technology (Sec 1052.4 (b))
- 1987 Netherlands *EIA Act* (amended 1994) – applies to specified national plans and programmes, including all those fixing the locations of projects for which an EIA is mandatory
- 1989 Australia *Resource Assessment Commission Act* – establishes independent inquiry body on resource policy issues (Commission disbanded in 1993, legislation retained);
- World Bank *Operational Directive 4.00* (amended 1991, 1999) – refers to preparation of sectoral and regional EA (Annex A 6-8)
- 1990 Canada *Environmental Assessment Process for Policy and Programme Proposals* by Order-in Council (amended 1999) – applies to proposals submitted to Cabinet
- 1991 New Zealand *Resource Management Act* – landmark sustainability law combining policy, planning and regulatory functions into omnibus regime;
- UK Guide on *Policy Appraisal and the Environment* – advice for central government agencies (updated by good practice guidance, 1994; amended 1998)
- UNECE (Espoo) Convention on EIA in a Transboundary Context (entered into force 1997) calls on the Parties ‘to the extent appropriate ...shall endeavour to apply’ the principles of EIA to policies, plans and programmes (Article 2(7))

SEA legal and policy developments

- 1992 UNECE pilot study of EIA of Policies, Plans and Programmes – recommends its application by member countries;
- Hong Kong *Environmental Implications of Policy Papers* by decision of then Governor – applies to proposals to Executive Council (later development plans)
- 1993 Denmark *Environmental Assessment of Government Bills and Other Proposals* by Prime Minister's Office (PMO) circular (amended 1995, 1998 when it became legally binding) – applies to draft legislation to Parliament and to strategic proposals on which Parliament must be consulted
- European Commission *Environmental Assessment of Legislative Programme* by Internal Communication – applies to legislative proposals and other actions by Commission
- 1994 UK Guide on *Environmental Appraisal of Development Plans* – advice to local authorities on how to carry out their responsibilities under planning legislation (updated 1998);
- Norway *Assessment of White Papers and Government Proposals* by Administrative Order – contains provisions relevant to environment but applies primarily to economic & administrative consequences
- Slovakia *EIA Act* – contains requirement to assess basic development policies, territorial plans in selected areas and any legislative proposal that may have an adverse impact on the environment (Art. 35)
- 1995 Netherlands *Environmental Test* by Cabinet Directive – applies to draft legislation, part of comprehensive review of enforceability, feasibility and impact on business
- 1996 *Proposal* by European Commission for a Directive on the assessment of the effects of certain plans and programmes (COM (96) 511; amended by COM (99) 73) and *Common Position* (5865/00)
- 1998 Finland *Guidelines on Environmental Impact Assessment of Legislative Proposals* by Decision-in-Principle – apply to law drafting, also decrees, resolutions and decisions
- UNECE (Aarhus) *Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters* (entered into force 2001) – provision for public participation in Articles 7 & 8, respectively, refers to plans, programmes and policies and to laws and regulations relating to environment;
- Declaration* by the Environment Ministers of the UNECE region on Strategic

SEA and legal policy developments

Environmental Assessment (ECE/CEP/56) – inviting countries and international finance institutions to introduce and/or carry out SEA ‘as a matter of priority’

1999

Australia *Environmental Protection and Biodiversity Conservation Act* – introduces provisions enabling SEA of policies, plans and programmes

Finland *Act on Environmental Impact Assessment Procedure* applies to policy, plans and programmes;

UK *Proposals for a Good Practice Guide on Sustainability Appraisal of Regional Planning*

2000

South Africa *SEA Guidelines* – non-mandatory application to plans and programmes

2001

SEA Directive (2001/42/EC) – enters into force in EU member states in July 2004;

Decision to negotiate an SEA Protocol by the Parties to the Espoo Convention – for possible adoption at fifth Ministerial ‘Environment for Europe’ Conference (Kiev, May 2003)

Source: Sadler, 2001

Principles for good practice of SEA

A detailed list of principles for good practice of SEA*Policy framework*

- Effective application of SEA requires open and accountable political and organizational systems
- SEA should be undertaken in the context of national and or institutional sustainability policies and strategies
- Action plans for sustainable development can provide specific and quantitative environmental objectives as benchmarks to environmental impacts of strategic actions
- Identify the relationship between SEA and other policy instruments in decision-making and establish mechanisms that ensure integrated decision-making
- Identify criteria and mechanisms to evaluate significance and determine acceptability against policy framework of environmental objectives and standards

Institutional

- Provide for an institutional framework that will facilitate integrated decision-making
- Establish internal and external organizational frameworks that will ensure a continuous flow and interaction along the various stages of the SEA process
- Assign specific responsibilities and accountability relatively to key decision-making points
- Provide for a regulatory framework that is appropriate and necessary

Procedural

- SEA should be an intrinsic element of policy and programme development processes and should be applied as early as possible
- The focus of SEA should be on the fundamental elements of policy proposals
- Establish to what kind of instruments should SEA apply
- Establish when should SEA be applied
- Be focused and ask the right questions when using SEA
- The scope of SEA must be comprehensive and wide-ranging to be able to act as a sustainability tool
- The scope of the assessment must be commensurate with the proposals potential impact or consequence for the environment
- SEA must help with the identification and comparison of equally valid options
- Relevant factors, including physical, ecological, socio-economic, institutional and political factors should be included in the SEA as necessary and appropriate
- Public involvement should be a fundamental element in the process of SEA, consistent with the potential degree of concern and controversy of proposals

Principles for good practice of SEA

- Objectives and terms of reference should be clearly defined
- Develop guidance that will set SEA in motion
- Use simple methodological approaches
- Provide for public reporting of assessment and decisions (unless explicit, stated limitations on confidentiality are given)
- Establish monitoring and follow-up programmes to track proposals
- Establish independent oversight of process implementation, agency compliance and government-wide performance

Procedures and methods for carryout SEA

Selected examples of institutional frameworks for SEA

Country/ Organisation	Provision	Scope and relationship to decision making	Elements of process and procedure
Australia	<i>Assessment Commission Resource Act</i> (1989) – legislation retained, but Commission disbanded (1993)	Major resource issues referred by Prime Minister's Office	Public inquiry, review of ecological, social and economic aspects
Canada	Cabinet Directive 1990, (amended 1999)	Policy, plan and programme proposals submitted to Cabinet	Informal procedure, separate from project EIA
Denmark	Prime Minister's Office circular (1993, amended 1995 & 1998 – when requirement became legally binding)	Bills and other Government proposals sent to Parliament or on which Parliament must be consulted	Informal procedure, separate from project EIA
The Netherlands	<i>Environmental Impact Assessment Decree</i> (1987, amended 1994)	Listed plans and programmes, referred to as strategic EIA (SEIA)	EIA procedure applies in full
	Cabinet Order (1995)	Legislative proposals to Cabinet, referred to as environmental [E]-test	Informal, separate procedure, linked to business and regulatory tests
New Zealand	<i>Resource Management Act</i> (1991)	SEA elements provided by policy statements, regional and district plans, which govern resource consents	No definable procedure; part of 'effects-based' policy and plan-making
United Kingdom	Guidance on Policy Appraisal and the Environment (1991; amended 1997)	Policies, plans and programmes developed by central government agencies	Internal procedure of environmental cost benefit appraisal
	Planning and Guidance Note 12 (1992; amended 1998) to local authorities	Development plans prepared by local planning authorities at county level	Environmental appraisal integral part of plan-making
	Proposals for sustainability appraisal of regional plans	Regional strategy to guide development at county level	Sustainability appraisal integral part of strategy-making
USA	<i>National Environmental Policy Act</i> (1969) and <i>Regulations</i> (1978)	Legislation and programmes – actions that can be grouped geographically,	NEPA process applies; specific guidance on

Principles for good practice of SEA

		generically or by technology	preparing generic and programmatic EISs
European Community	Council Directive on the assessment of certain plans and programmes (2001)	Plans and programmes in defined areas, including sectors and land use	Framework law, specifies minimum procedure to be followed by member states
World Bank	Operational Directive on Environmental Assessment (OD 4.00, Annex A, 1989; amended as OD 4.01, 1991, 1999)	Bank financed plan, programme or series of projects for a particular sector or region	Policy encourages use of sector and regional EA by borrowing country

Source: Sadler and Verheem, 1996 (updated and amended)

Topic 15

Future directions

Introduction

Checklist

Session outline

Reference list and further reading

Training activities

Support materials

Topic 15 – Future directions

Objective

To make participants aware of:

- emerging trends in EIA and SEA and where they appear to be leading;
- the particular importance of developing an integrative approach toward sustainability appraisal; and
- the relationship of EIA and SEA with other impact assessment and appraisal tools in this regard.

Relevance

The approach of this manual has been to take the participants step by step through the requirements for effective project EIA, and to introduce the role and scope of SEA. Project EIA and SEA, however, are part of a much larger kit of impact assessment and environmental management tools. In the future, their application is likely to become part of more integrative approaches to sustainability appraisal.

Timing

One hour

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.

Topic 15
Future
directions



Information checklist

Obtain or develop the following, as appropriate:

- ☐ examples of recent and emerging trends in the development of EIA locally;
- ☐ examples of local use of other forms of impact assessment, economic and social appraisal and environmental management systems;
- ☐ copies of sustainable development policies, plans and strategies that have been prepared or are used locally;
- ☐ contact names and telephone numbers of people, agencies, organisations and environmental information/data resource centres able to provide assistance in relation to these trends, policies and tools; and
- ☐ other resources that may be available such as videos, journal articles, computer programmes, lists of speakers, case studies etc.

Session outline

Briefly recall the key characteristics of EIA and SEA as presented in this manual. Introduce the challenges that still need to be met, placing them in a forward-looking context.



1

The training modules in this manual have presented EIA as a tried and tested process, which contributes to sound planning and management of development proposals. EIA is part of a family of impact assessment tools that are widely agreed to offer a solid foundation on which to undertake an integrated sustainability appraisal. Specifically, EIA provides an entry point for integration with economic and social appraisal tools. Firstly, EIA already includes consideration of social, health and other factors and, secondly, it is enshrined in legislation in so many countries. Other tools do not have this status, nor are any likely to assume it in the immediate future.

Elsewhere in this Manual, EIA is identified as a *foundation tool* for sustainable development (see Section A – *The manual in perspective*). It provides:

- a sound basis for further legal and institutional development;
- a stepping stone to other more integrative and strategic modes of analysis;
- an established means to inform decision-making and promote environmentally sound development; and
- a vehicle by which environmental and social values are introduced and instituted in the policy mainstream.



2

The introduction of SEA has strengthened and extended the value of EIA as a foundation tool for sustainable development (see Topic 14 – *Strategic Environmental Assessment*). In particular, SEA helps to overcome the limitations of project EIA as a 'stand alone' approach, applied relatively late in the decision-making cycle. SEA is applied to policy, plan and programme proposals, when major alternatives are open and systematic consideration can be given to their environmental effects and implications. This process also corresponds to options appraisal of development proposals to find the best practicable outcome having regard to all the potential impacts.



3

In practice, however, EIA and SEA fall short of functioning as true sustainability instruments. Further changes are needed if they are to realise their potential in this regard. SEA is not yet in widespread use and EIA needs to be strengthened at basic levels in many developing countries. Elsewhere, EIA and SEA are wanting in their consideration of cumulative effects, biodiversity loss and large-scale changes to natural systems (see Topic 1 – *Introduction and overview of EIA*). As such, they currently can provide only limited assurance that development proposals are environmentally sustainable.



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Looking ahead, this challenge is likely to become more pressing and urgent as a result of globalisation, trade liberalisation, deregulation and other

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market forces. In turn, the environmental footprint of economic activity can be expected to become ever larger, more complex and interconnected spatially. There are evident limitations on EIA as a systematic process to predict and mitigate the adverse environmental impacts of proposed actions. In the future, assessment will need to be more adaptive as well as integrative, for example, by adopting a precautionary approach based on best estimates of safe development thresholds and backed by monitoring, auditing and other checks.

Introduce a framework and process to discuss future directions in EIA and SEA. Ask participants to relate this to local circumstances and needs.

Future directions for EIA and SEA can be discussed from a number of perspectives. These include:

- What ideally should happen?
- What realistically is likely to happen?
- What probably could happen if policy intervention and capacity building were better targeted?

Each of these perspectives can be used by trainers as building blocks or stepping stones to develop views on future directions for EIA and SEA. First, the sustainability agenda can provide an appropriate context or reference point to identify needed changes to EIA and SEA. Second, consideration can be given to the aims and trends that drive development activities and underlie environmental and social impacts. Third, use can be made of local information on the policy and institutional framework to develop conclusions on what could be possible in the way of policy intervention and capacity building to improve EIA and SEA.

Ten years after Rio, the challenge of sustainable development has not changed. Without better care of the environment, the prospects for development will be undermined; and development is critical in a world where more than three-fifths of the population live at or near subsistence level. A review of progress that has been made since Rio to address these issues will take place in Johannesburg in September 2002. Early indications are that the Summit will focus primarily on poverty, development and the environment, emphasising the aims and concerns of developing countries (see Box 1)

Needed directions for EIA in a particular region or country are best identified through the lens of the development agenda and its critical impacts. In some developing regions, for example, environmental deterioration threatens the ability of nations to meet the basic needs of their populations for food, water and shelter. Where environmental deterioration and poverty are closely linked, EIA will need to focus on this relationship much more in the future. Usually, however, the poorest countries have the



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least capacity to use EIA as a tool to help achieve poverty reduction, improve health and promote sustainable livelihoods.

These realities are being given increasing attention by multilateral financial institutions and donor countries, and their environmental and poverty reduction strategies can provide a useful framework for consideration of future directions for EIA. For example, the World Bank's Africa Region Environmental Strategy includes broad priorities for action and sub-regional objectives (see Box 2). Similar strategies are in place for other regions. They indicate future directions for policy intervention and capacity building, which can be checked against information on local EIA needs (as identified from the exercise in Section B of the manual).

Box 1: Major aims of development

Some of the major aims of development are listed below. Check to see which ones are important regionally or locally:

- *reducing poverty* -- 3 billion people live on less than US\$2 per day
- *doubling available food supply* -- required to meet projected increase in world population, but without excessive use of chemicals, conversion of natural habitat or degradation of marginal lands
- *supplying energy services* -- 2 billion people without electricity, cooking with traditional fuels associated with high incidence of health problems
- *providing access to water to meet basic needs* -- 1 billion people live without clean water, 2 billion without sanitation
- *improving urban environments* -- the urban poor lack basic services and infrastructure)

Source: UNEP, NASA and World Bank (1998)

Box 2: The World Bank 's African Region Environmental Strategy

The Strategy aims to help borrowing countries achieve poverty reduction through better environmental management. Major objectives are to:

- ensure sustainable livelihoods by protecting productive resources and ecosystems
- improve health by tackling environmental determinants of endemic disease
- reduce vulnerability to natural disasters and extreme climatic events

A people-centered, ecosystem approach to development is taken. The Strategy identifies:

- three broad priorities for action – quality of life, quality of growth and quality of the global commons

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- specific priorities for six sub-regions and a number of key sectors, such as agriculture and rural development

Means of implementing the Strategy include:

- improving the application of environmental assessment
- strengthening land use and sectoral environmental planning
- providing the essential institutional and technical tools for environmental management

Source: World Bank (2001)

Describe some of the trends and imperatives for sustainable development that are shaping future directions for EIA and SEA, internationally, regionally and locally. Explain why there is a shift toward more integrative approaches and greater use of EIA and SEA as sustainability tools.

The UNEP report on *Protecting Our Planet; Securing Our Future* describes the linkages between environment and development issues and highlights their policy and scientific implications. It identifies three broad themes that bear upon future directions for EIA and SEA as sustainability tools:

- Impacts – what are the environmental and social changes that matter and that need to be taken into account?
- Drivers – what are the underlying trends that need to be understood and factored into analysis and mitigation of adverse impacts?
- Response – what changes and improvements are necessary to EIA and SEA process and practice if they are to function more effectively as sustainability tools, having regard to any constraints?

The Report confirms:

- activities to meet human needs have global environmental consequences that are cumulatively and qualitatively different from what has gone before;
- population growth, increasing consumption and use of technology are the underlying forces responsible for environmental degradation; and
- assessing these linkages systematically and holistically offers the best opportunity to identify cost-effective policy interventions to promote sustainable development.

Despite the agreements reached at Rio and afterwards, human activities continue to have an unparalleled impact on the global environment (see Box 3). The Earth is approaching critical thresholds beyond which natural systems may not be able to accommodate all of the pressures imposed on them without their functions becoming significantly impaired. Many of the issues are interdependent and reinforcing; for example, climate change can lead to loss of biodiversity and invasion of exotic species, pests and disease vectors. Other than for stratospheric ozone loss, major steps toward slowing the trend lines of global environmental deterioration have yet to be taken.



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New approaches to policy making and analysis must be found to manage the range and magnitude of environmental impacts and simultaneously achieve the major aims of development proposals. This was one of the main conclusions reached by the World Commission on Dams, which reported that often an unacceptable social and environmental price has been paid to secure the economic benefits of major hydro projects. It called for a comprehensive approach to assessing the social, environmental and economic dimensions of development options. The Commission also recommended paying greater attention to these aspects during project implementation and operation.

In this context, EIA and SEA are important because they are being extended in these directions already. Further innovation can accelerate the trends:

- 'upstream' toward sustainability appraisal – by integrating EIA and SEA with SIA and benefit-cost analysis and other economic and social appraisal tools; and
- 'downstream' toward environmental management – by combining environmental assessment with environmental accounting and environmental auditing.

Box 3: Global and large scale environmental impacts

Eight major global environmental issues are listed below. Check to see which ones are important regionally or locally:

- climate change -- the Earth's average temperature projected to increase by 1.4 to 5.8 degrees C during next 100 years
- loss of biological diversity -- current rates of species extinction estimated to be 50 to 100 times the expected natural rate
- stratospheric ozone depletion -- reduction ranges from 60% over Antarctica (in Spring) to 3-5% in mid latitudes (year round average)
- freshwater supply and quality -- one-third of the world's population live in water stress areas, expected to rise to two-thirds by 2025
- land degradation and desertification -- one-quarter of the Earth's surface estimated to be affected, mainly arid rangelands but also irrigated and rain-fed agricultural lands
- deforestation and unsustainable harvesting -- globally 12 to 15 million hectares lost each year as a result of conversion, pollution and timber cutting
- marine degradation and over-fishing -- coastal areas and oceans threatened by nutrient overloading and trace contaminants, many major fisheries are classified as over-exploited
- persistent organic pollutants -- chemicals that bioaccumulate in fatty tissues at different levels in the food chain, health risks associated with human exposure to certain substances, worldwide build up as a result of their long range transportation

Source: UNEP, NASA and World Bank (1998)

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Describe the basic aspects and issues that are encountered in moving EIA 'upstream' toward integrated impact assessment and sustainability appraisal. Indicate whether and how these are relevant or applicable to the local situation, using the results of the Training Needs Analysis where appropriate.



8 & 9

The shift upstream toward more integrated forms of impact assessment extends the type of effects and scope of linkages to be considered. An integrated assessment considers the economic, environmental and social consequences of proposed actions and options, including measures to mitigate adverse effects and to enhance positive effects. Decision-makers also need to consider the consequences of their choices within a broader framework of values and criteria than before. The World Commission on Dams states that the decision-making process itself must be fundamentally altered to reconcile competing aims and considerations (see Box 4).

An integrated approach to impact assessment can be equated with sustainability appraisal, especially where it is based upon objectives, principles, criteria and indicators of sustainable development. These aspects can be found in Agenda 21, other Rio agreements and national strategies for sustainable development, and used to identify the relevant economic, environmental and social impacts that need to be taken into account. When carrying out an integrated assessment of development proposals, these characteristics are referred to as the triple 'bottom lines' of economic feasibility, environmental capacity and social equity. Their definition helps to clarify the real costs and trade-offs that are at stake in a particular situation.

This process facilitates *balanced* decision-making, helping to ensure that economic development is not achieved at the expense of the environment or people. An integrated assessment incorporates multiple goals and considerations. It is both the only route to make real progress toward more sustainable development and one of the biggest challenges to getting there. Aiming to meet several goals at the same time usually prevents any one being maximised and vice versa. For example, an irrigation scheme that is projected to maximise agricultural output may have significant environmental and social impacts, and avoiding and minimising these effects may significantly reduce projected output.

In principle, integrated assessment calls for economic, environmental and social considerations to be placed on an equivalent footing and considered at the same time in the process of development decision-making. The key characteristics of this approach are that:

- all impacts and costs associated with major development proposals and alternatives must be fully and systematically analysed in order to optimise the choice to be made; and
- all proposals that are approved must meet economic, environmental and social objectives at some threshold or minimum level in order to be consistent with the notion of sustainable development.

Recently, UNEP has promoted integrated assessment of trade-related policies and liberalisation agreements. When conducting trade negotiations, few governments give sufficient attention to their wide-ranging effects on the economy, the environment and society or measures to address and regulate them. A UNEP reference manual has been developed for this purpose. It should be consulted, together with the companion volume to this manual (*Environmental Impact Assessment and Strategic Environmental Assessment: Towards an Integrated Approach*), when presenting this module. The approach to integrated assessment recommended by the reference manual is summarised in Annex 1.

Some EIAs correspond already to integrated assessments by including consideration of social, health and certain types of economic impacts (for information on methods and tools used see Topic 6 – *Impact analysis*). However, EIA and SEA have yet to systematically test development proposals against environmental ‘bottom lines’ or explicit sustainability criteria. In this context, EIA and SEA are concerned with maintaining the capacity and integrity of natural systems rather than minimising impacts.

A framework for this purpose can be introduced by:

- identifying sustainability objectives and criteria as expressed in government policy;
- applying the precautionary principle based on the mitigation hierarchy of avoid, mitigate and compensate (see Topic 7 – *Mitigation and impact management*); and
- use of the polluter pays principle to require ‘in-kind’ replacement or compensation for residual impacts that cannot be mitigated or avoided.

Box 4: New approaches to development decision-making as proposed by the World Commission on Dams

The World Commission on Dams considers that the way development decisions are made must be fundamentally altered if the environmental, economic and social impacts of major proposals are to be reconciled. It recommends this is achieved by introducing new perspectives and criteria, establishing processes that build consensus around the options selected and basing decisions on five core values or tests. These values are equity, efficiency, participatory decision-making, sustainability, and accountability.

Applying these core values to decision-making requires an open, transparent and inclusive process. This involves pursuing a negotiated outcome. A three-step approach is followed to recognise rights, assess risks and reconcile competing needs and entitlements.

- First, clarify the claims and entitlements that may be affected by a development proposal and alternatives. This is a pre-condition for the identification of legitimate stakeholders who are entitled to a formal role in the consultative process, and in negotiating specific agreements on benefit sharing and compensation for loss.
- Second, identify and assess the major risks and impacts on people’s lives and livelihoods. Their stake in the development decision-making process then

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should be commensurate with their exposure to risk, extending the notion of risk to those affected involuntarily by a proposal and to the environment as a public good.

- Third, engage risk bearers and risk proponents in negotiating an equitable outcome to the issues at stake. Prior recognition of rights and assessment of risks lays the ground for informed and legitimate decision-making on major development proposals that have far reaching impacts.

Source: *World Commission on Dams (2001)*

Describe the basic aspects and issues that are encountered in moving EIA 'downstream' toward integrated environmental management. Indicate whether and how these are relevant or applicable to the local situation, using the results of the Training Needs Analysis where appropriate.



10&11

The shift 'downstream' toward environmental management extends the range of impacts to be considered. Attention is given to all impacts on the environment, not only those associated with proposed developments. Existing economic activities, from subsistence agriculture to industrial manufacturing, are far more important than new projects in contributing to resource depletion and ecological deterioration. If they are to be assessed and managed systematically, the linkage and interaction among environmental issues and impacts needs to be placed in larger scale, longer term frameworks than are possible in EIA and SEA of proposed actions.

Particular attention is given to the environmental management of business and industrial facilities, products and services. In recent years, enterprises in many parts of the world have established their own environmental management systems (EMS) in accordance with the principles and specification laid down by ISO 14000 series. Under this framework, an EMS describes the procedures, responsibilities, tools and practices that an organization should follow to manage its environmental impacts (see Box 5). ISO 14001 is widely seen as providing an effective approach to environmental management for business and industry.

However, the large majority of private sector firms are not signed up to ISO 14001, and there is little take up by small and medium enterprises. In addition, many other economic activities are not subject to any form of environmental management and control. The *UNEP Global Environmental Outlook (GEO-2000)* cites the lack of appropriate policy frameworks and tools for integrated environmental management (IEM) as one of the reasons why 'full scale emergencies now exist on a number of issues'.

Three major issues are identified as standing in the way of achieving IEM:

- knowledge gaps – GEO-2000 shows that a lack of comprehensive assessment and monitoring still impedes environmental policy making and regulation;
- failure to address root causes – policy instruments still focus on specific impacts, rather than considering the cumulative effects of driving trends in population, consumption and technology; and

- need for better cooperation – the importance of engaging all stakeholders in environmental management is emphasised throughout both GEO-2000 and the report of the World Commission on Dams (Box 4 above).

When combined, a number of established policy tools provide the building blocks for a comprehensive, effects-based system of environmental management:

- *environmental accounting* – to record changes to resource stocks in national income accounts so that the true cost of depletion and pollution is shown;
- *environmental assessment* – to analyse the environmental impacts of major development proposals and mitigate their adverse effects; and
- *environmental auditing* – to verify that existing business and industry practices comply with environmental regulations and standards.

Environmental accounting provides a means of valuation of the real wealth of a country. It is a macro-policy tool that indicates broad, sustainability related trends in resource depletion and environmental deterioration. Non-sustainable resource use is treated as depreciation, and shown as a deduction from national income or gross domestic product. The net adjustment that is made should reflect the rate at which, say, timber cut or fish harvested exceeds natural regeneration. Although open to debate, this accounting device highlights over-exploitation of natural resources, showing that many countries are poorer than is suggested by the conventional economic accounts.

Environmental audits are used for a number of different purposes. They can be carried out as part of the environmental management plan for projects subject to EIA, for example to check that impacts are as predicted and mitigation measures are working as intended (see Topic 11 – *Implementation and follow up*). Other forms of environmental audit are widespread in industry and business, where they are used to examine environmental risks and liabilities and verify that a company's environmental practice and performance meet the necessary standards.

Box 5: EMS components and tools

The ISO 14000 series comprises an internationally recognised framework for business and industry to manage the environmental impact of their activities, products and services. Environmental management systems (EMS) that are registered to ISO 14001 provide a coherent regime for organisations to ensure their operations comply with applicable laws, regulations and objectives. A common approach of plan, do, check and act is followed to control and reduce environmental impacts, both internally, within a business, and externally, throughout the supply chain of larger companies.

ISO 14000 is still under development. A number of standards have been published; others are being finalised. The series can be grouped into several components including:

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- *Environmental management systems* – ISO 14001 specifies the requirements against which an EMS may achieve independent, third party certification. Other standards provide guidance on EMS principles and their application (ISO 14004), define terms (ISO 14050) and identify criteria for performance review (ISO 14031).
- *Environmental auditing* – There are three standards relating to broad guidance (ISO 14010), procedures for auditing an EMS (ISO 14011) and qualification criteria for practitioners (ISO 14012).
- *Eco-labelling* – This term describes the information for purchasers and consumers that is placed on products to describe their environmental impact. Standards cover principles of eco-labelling (ISO 14020), codes of practice for green claims (ISO 14021) and labelling procedures (ISO 14024).
- *Life cycle assessment* – LCA is a tool for systematically analysing the impact of a product or service across all stages of its development from cradle to grave. The principles and phases of LCA are set out in ISO 14040.

Conclude by considering the steps and measures that are needed to strengthen EIA and SEA locally. Ask participants how these might lead towards the integrated approaches discussed above.



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By itself, or even with SEA, EIA is insufficient to address the scale and scope of environmental problems caused by accelerated economic growth. There is now agreement on the need to adopt more integrated approaches, encompassing a range of tools, to deal with the multiple causes of environmental degradation. Getting there will take time, and progress can be expected to vary from country to country.

In the interim, incremental steps and measures to improve EIA and SEA practice can help to get there from here. The specific requirements and opportunities that apply locally can be established via the process introduced earlier and using the results of the Training Needs Analysis. Some pointers are given below to general directions, which are drawn from international experience.

Immediate improvements to EIA (and SEA) practice can be made through:

- better information on EIA practice, e.g. lessons of case experience and updates on developments in law and process;
- better training in EIA, preferably as part of an overall strategy of capacity building and/or continuing professional development; and
- better guidance on EIA best practice, which demonstrates rather than just states how principles and procedures can be applied to resolve problems and inform decision-making.

Within the near term, EIA processes could be improved by:

- strengthening procedural checks and balances for quality assurance and control, paying attention to acknowledged weak links (e.g. scoping and follow-up);

- emphasising monitoring and other tools for project implementation and operation;
- encouraging the extension and wider take up of SEA, and adapting it to the requirements of developing countries;
- promoting learning by doing, especially when EIA and SEA are applied to new areas or issues; and
- reinforcing core competencies and encouraging new skills (through better information, training and guidance as above).

Over the short to medium term, EIA and SEA could be sharpened as mechanisms for sustainability assurance by:

- coordinating these processes upstream with economic and social appraisal and downstream with EMS tools;
- developing operational frameworks of environmental sustainability against which development proposals can be tested for consistency;
- developing operational frameworks of environmental, economic and social sustainability against which integrated or full cost impact assessment of development proposals can be conducted; and
- applying them to new areas of emphasis, particularly sectors that have global and cross-cutting impacts such as trade, financial investment and technology transfer.

Complete this segment by drawing the group 's attention to *Environmental Impact Assessment and Strategic Environmental Assessment: Towards an Integrated Approach* which has been produced as a supporting volume for this Manual. Also encourage further networking among those involved in EIA and the use of electronic networks such as those listed in the Contacts section at the front of this manual to establish contacts, access new case studies and to download other information and training materials. Give directions for accessing these networks (see verso of the manual title page for details).

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Annex 1: UNEP framework for integrated assessment as applied to trade policy.

Why undertake an integrated assessment of trade proposals?

This approach can serve a number of interrelated purposes:

- clarifying the linkages between environment, trade and development;
- informing decision-makers on key issues that need consideration in trade negotiations;
- designing options and policy packages that integrate the environment into proposed agreements and actions; and
- increasing the transparency of the policy making process.

What are the main aims and benefits of an integrated assessment?

The main aim of an integrated assessment is to facilitate informed and balanced decision-making in support of sustainable development. This process points toward appropriate policy responses to mitigate any harmful impacts of proposed actions on the environment or society and to promote positive effects. For example, trade agreements can be modified prior to or after implementation, or 'flanking' policies can be adopted that simultaneously promote economic, environmental and social goals. These policies can be applied at national, regional or global levels.

How to carry out an integrated assessment?

A five-step approach to the conduct of an integrated assessment is outlined below. This framework identifies a menu of options that can be employed, depending on a particular situation, level of resources, and set of priorities.

Step 1: Identifying purpose and scope. It is important to establish whether an integrated assessment will cover all or some combination of the purposes listed above. Scoping can help to establish the main issues, the boundaries of potential environmental and social impacts and the relationship to other policy areas (see Topic 6 – *Scoping*). For example, a review of trade issues might include the relationship to exchange and interest rates, private investment, income distribution and land tenure arrangements.

Step 2: Designing an integrated assessment. Key issues to be decided at the beginning of the process include: timing of assessment, stakeholder and public participation, data availability and sources, methodology and means of consultation, and identification of indicators that are relevant to sustainable development. These considerations will be driven by the role and purpose of an integrated assessment (Step 1). For example, in the case of trade negotiations, there will be important differences between ex-ante (prospective) and ex-post (retrospective) review of the environmental and social impacts.

Step 3: Use of methods and techniques. A large number of methods and techniques are available to carry out an integrated assessment. Many of these are well established and used already in EIA, SIA and economic appraisal. Specific attention needs to be given to valuing environmental and social impacts that are hard to cost, and to means of weighting when making trade-offs. Use of appropriate methods for this purpose is described in Topic 6 – *Impact analysis* and Topic 13 – *Social Impact Assessment*.

Step 4: Policy response. The transition from analysis to policy is a critical step, which typically is taken with little or no practical guidance or recognition of how key stakeholders influence the process of decision-making. With regard to trade, there is a broad range of possible policy responses. For present purposes, this can be divided into two general categories: modifying and extending a trade agreement or policy by inclusion of environmental and social safeguards; and instituting flanking policies to enhance the positive effects and mitigate adverse impacts.

Step 5: Monitoring and evaluation. Following the introduction of flanking policies, it is prudent to monitor and evaluate their effectiveness in addressing environmental and social impacts. An impact tracking system can be based on a set of indicators identified in Step 2. This system will require certain resources and institutional arrangements to be in place in order to systematically oversee monitoring and ensure unforeseen impacts are addressed.

Source: UNEP (2001)

Reference list

The following references have been quoted directly, adapted or used as a primary source for major parts of this topic.

Sadler B (1996) *Environmental Assessment in a Changing World: Evaluation 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.

Sadler B (1999) A Framework for Environmental Sustainability Assessment and Assurance. In Petts J (ed.) *Handbook of Environmental Impact Assessment* (Vol. 1, pp.12-32). Blackwell Science Ltd, London, UK.

UNEP (1999) *Global Environment Outlook – GEO 2000*. Earthscan, London.

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World Bank (2001) *Environment Matters*. Environment Department, World Bank, Washington, D.C. (www.worldbank.org)

World Commission on Dams (2000) *Dams and Development: A New Framework for Decision-Making*. Earthscan, London. (www.unep-dams.org)

Further reading

Environmental Assessment Yearbook 2001. Institute of Environmental Management and Assessment and EIA Centre, University of Manchester, Lincoln, UK.

Kirkpatrick C and Lee N (eds.) *Sustainable Development and Integrated Appraisal in a Developing World*. Edward Elgar, Cheltenham, UK.

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

- 15-1 What trends in society, environment and the economy bear on the future directions and challenges for EIA?
- 15-2 What factors do you feel will have the most influence in the development of EIA locally over the next five to ten years?
- 15-3 What are the main impediments to changing the EIA system locally? How could these impediments be overcome? What role might capacity building play?
- 15-4 Identify some of the implications of sustainable development for the future directions of EIA process and practice locally.
- 15-5 Consider the feasibility of moving EIA upstream toward sustainability appraisal and downstream to integrated environmental management.

Speaker themes

- 15-1 Invite a speaker to outline the local, regional and global challenges that EIA will be expected to meet in the next ten years.
-

Group Activity 15–1: Future directions

If required use the framework and process for discussing future directions to identify practical steps that could be taken toward establishing the frameworks for integrated assessment.



1

Using EIA to move towards sustainability

- EIA is a foundation tool
- EIA is a tried and tested process
- EIA is a legal requirement in many countries
- EIA is an integrative tool already
- EIA is well positioned for the next steps
- EIA is suited to capacity building



2

Using SEA to move toward sustainability

- SEA adds value to foundation tool
- SEA complements and extends EIA
- SEA being adopted by more countries
- SEA addresses major alternatives
- SEA is step toward comprehensive options assessment



3

Current realities

- EIA basics need strengthening in many developing countries
- SEA still used primarily by developed countries
- EIA and SEA yet to realise their full potential
- limited consideration of global, large scale changes
- current practice provides minimal level of 'sustainability assurance'



4

Emerging challenges

- new challenges imposed by globalisation
- environmental impacts becoming larger, more complex
- increasingly difficult to predict and mitigate
- shift toward adaptive and integrative assessment
- emphasis on precautionary rather than predictive approach
- use of best estimate science to identify safe margins
- backed by monitoring, auditing and other checks



5

Considering future directions step by step

- Step 1: What ideally should happen?
 - identify needed changes from national sustainability agenda
- Step 2: What realistically is likely to happen?
 - consider development aims and trends that apply locally
- Step 3: What probably could happen with capacity building?
 - reach conclusions based on strategies in place or pending



6

Key trends and imperatives for sustainable development

- *impacts* – rate and scale of global change unparalleled
- *drivers* – population growth, increasing consumption and technology
- *response* – linkages must be assessed systematically and holistically
- *sustainability* – reconciling environmental, economic and social aims



7

Two main directions for EIA and SEA

- 'upstream' toward sustainability appraisal by integrating EIA and SEA with other impact assessment tools
- 'downstream' toward environmental management by combining assessment, accounting and auditing tools.



8 & 9

Aspects and issues of sustainability appraisal

- full cost analysis of development proposals
- equated with integrated impact assessment
- identifies economic, environmental, and social effects
- incorporates sustainability aims, principles, criteria
- clarifies trade-offs and facilitates balanced decision-making
- triple bottom line must be met at minimum level
- new approach to decision-making needed
- examples of applications include:
 - sustainability assessment of trade
- framework for environmental assurance and assessment
- core values and criteria for decision-making



10 & 11

Aspects and issues of integrated environmental management (IEM)

- focus on environmental impacts of all development actions
- particular attention given to business and industrial operations
- EMS certified to ISO 140001 cover larger enterprises
- many activities and enterprises not subject to control
- lack of IEM framework and tools
- building blocks of IEM system include:
 - environmental accounting to cost depletion and damage
 - environmental assessment to provide sustainability assurance
 - environmental auditing to verify compliance and performance



12

Interim measures to improve EIA and SEA practice

- move toward integrated approach step by step
- getting there will take time
- progress will vary from country to country
- use TNA to identify priority requirements
- identify improvements that can be made now
- identify improvements that could be made in near term
- identify improvements that could achieve sustainability appraisal over medium term

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Acronyms

AEAM	adaptive environmental assessment and management
AEC	African Economic Community
CBA	cost benefit analysis
CEA	cumulative effects assessment
CIA	cumulative impact assessment
CEAA	Canadian Environmental Assessment Agency
CEQ	US Council of Environmental Quality
EC	European Community
ECE	Economic Commission for Europe
EIA	environmental impact assessment
EIS	environmental impact statement
EMP	environmental management plan
EMP	environmental monitoring plan
EMS	environmental management strategy
EMS	environmental management system
EO	environmental overview
EPA	Environment Protection Agency
ESCAP	Economic and Social Commission for Asia and the Pacific
FONSI	finding of no significant impact
GEF	Global Environment Facility
GIS	Geographical Information System
HIA	health impact assessment
IAIA	International Association for Impact Assessment
IAMM	impact assessment, monitoring and management
IEM	integrated environmental management
IRM	integrated resource management
LCO	life cycle assessment
MASAQHE	major action significantly affecting the quality of the human environment
NEAP	National Environmental Action Plan
NEPA	National Environmental Policy Act
NEQA	National Environmental Quality Act (Thailand)
NGOs	Non-government organisations
NSDS	national sustainable development strategies
OECD	Organization for Economic Cooperation and Development
PADC	project appraisal for development control system
PFF	project formulation framework
REA	regional environmental analysis
RDP	regional development plans
SAP	structural adjustment programs
SEA	strategic environmental assessment
SEAN	strategic environmental assessment
TNA	training needs analysis
ToR	terms of reference
UETs	ultimate environmental thresholds
UNCED	United Nations Conference on Environment and Development (1992)
UNDP	United Nations Development Programme

UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
VECs	valued ecosystem components
WCS	World Conservation Strategy

Glossary

abiotic

Non-living eg rocks or minerals.

ameliorative measures

See mitigation.

alternative

A possible course of action, in place of another that would meet the same purpose and need of the proposal.

audit

See environmental audit.

baseline studies

Work done to collect and interpret information on the condition/trends of the existing environment.

benefit-cost analysis

A method of comparing alternative actions according to the relative costs incurred (technical, environmental and economic) and the relative benefits gained. The analysis can incorporate discounting calculations to take into account the time value of money.

biodiversity

See biological diversity.

biological diversity

The variety of life forms, the different plants, animals and micro-organisms, the genes they contain and the eco-systems they form. It is usually considered at three levels: genetic diversity, species diversity and ecosystem diversity.

biophysical

That part of the environment that does not originate with human activities (eg biological, physical and chemical processes).

biota

All the organisms, including animals, plants, fungi and micro-organisms in a given area.

carrying capacity

The rate of resource consumption and waste discharge that can be sustained indefinitely in a defined impact region without progressively impairing bioproductivity and ecological integrity.

coherence in EIA

Aiming to achieve the co-ordination of EIA procedures, guidelines, standards and criteria by those involved in funding or approving proposals.

compensation

Trade-offs between different parties affected by proposals to the mutual satisfaction of all concerned.

cost-benefit analysis

See benefit-cost analysis.

cumulative effects assessment

The assessment of the impact on the environment which results from the incremental impact of an action when added to other past, present or reasonably foreseeable actions regardless of what agency or person undertakes such actions. Cumulative impact can result from individually minor but collectively significant actions taking place over a period of time.

decision-maker

The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal.

development proposals

Consists of a wide range of human activities which provide (a) favourable conditions for an increase in the transformation of the natural, biophysical environment to provide the goods and services available to society (eg. Structural adjustment programs, 'rolling' development plans) and (b) actions which directly produce the goods and services.

discretionary process/decision

A process or decision which the decision-maker is able to base on personal preference.

ecological processes

Processes which play an essential part in maintaining ecosystem integrity. Four fundamental ecological processes are the cycling of water, the cycling of nutrients, the flow of energy and biological diversity (as an expression of evolution).

ecosystem

A dynamic complex of plant, animal, fungal and microorganism communities and associated non-living environment interacting as an ecological unit.

endemic

Restricted to a specified region or locality.

environment

There is no generally agreed definition of environment in EIA. Increasingly, it means the complex web of inter-relationships between abiotic and biotic components which sustain all life on earth, including the social/health aspects of human group existence.

environmental audit

Process focusing on an existing installation, facility, or activity which involves a systematic, periodic evaluation of environmental management to objectively review the performance of an organisation, management and equipment with the aim of safeguarding the environment.

environmental assessment

See environmental impact assessment.

environmental impact assessment (EIA)

The systematic, reproducible and interdisciplinary identification, prediction and evaluation, mitigation and management of impacts from a proposed development and its reasonable alternatives. Sometimes known as environmental assessment.

environmental impact report/statement

Document in which the results of an EIA are presented to decision-makers and, usually, the public.

environmental management

Managing the productive use of natural resources without reducing their productivity and quality.

environmental management plan

See impact management plan.

environmental management system

A structured approach for determining, implementing and reviewing environmental policy through the use of a system which includes organisational structure, responsibilities, practices, procedures, processes and resources. Often formally carried out to meet the requirements of the ISO 14000 series.

fauna

All of the animals found in a given area.

flora

All of the plants found in a given area.

health impact assessment

Component of EIA which focuses on health impacts of development actions. Most attention is concentrated on morbidity and mortality, but increasingly, the World Health Organization (WHO) definition of health as being a state of 'social, physical and psychological well-being and not just the absence of disease' is being used to guide this type of assessment work.

impact management plan

A structured management plan that outlines the mitigation, monitoring and management requirements arising from an environmental impact assessment.

impact monitoring

Monitoring of environmental/social/health variables, which are expected to change after a project has been constructed and is

operational, to test whether any observed changes are due to the project alone and not to any other external influences.

initial environmental evaluation/examination

A report containing a brief, preliminary evaluation of the types of impacts that would result from an action. Often used as a screening process to assess whether or not proposals should undergo full scale EIA.

interdisciplinary team

A group of people, from a range of disciplinary backgrounds, working together to ensure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making which may have an impact on man's environment.

level of assessment

See tiering.

memoranda of understanding

A written agreement between two or more levels or areas of government.

mitigation

The purposeful implementation of decisions or activities that are designed to reduce the undesirable impacts of a proposed action on the affected environment.

monitoring

Activity involving repeated observation, according to a pre-determined schedule, of one or more elements of the environment to detect their characteristics (status and trends).

'moving' baseline

Existing state of the environment projected into the future assuming no development proceeds. The projected baseline situation, rather than that existing at the time of EIA work, is theoretically the one to be compared with the state of the environment predicted in the event of a development action proceeding.

natural resources

Features that have ecological, economic, recreational, educational or aesthetic value.

natural resource accounting

Transformation of data, on environmental features (components and processes) and renewable/non-renewable resources, into a form that is comparable with data on the economy. Incorporation of the environmental data into the standard set of economic accounts (eg. gross national product) used in government policy-making.

NEPA

National Environmental Policy Act 1969 of the United States of America. This Act, which applied to Federal US agencies, was the first policy to require the preparation of a statement of the predicted environmental impact of a proposal. This statement has since become known as the Environmental Impact Statement (EIS).

precautionary principle

A principle of sustainability that where there are threats of serious or irreversible damage, the lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

proponent

Organisation (private or public sector) or individual intending to implement a development proposal.

proposal

Any project, policy, program, plan or other activity.

public consultation

See public involvement.

public involvement

A range of techniques that can be used to inform, consult or interact with stakeholders affected by a proposal.

resource

Anything that is used directly by people. A renewable resource can renew itself or be renewed at a constant level. A non-renewable resource is one whose consumption necessarily involves its depletion.

risk analysis

Technique used to determine the likelihood or chance of hazardous events occurring (such as release of a certain quantity of a toxic gas) and the likely consequences. Originally developed for use in nuclear and chemical industry where certain possible events, of low probability, could have extremely serious results. Attempts are being made to use concepts from probabilistic risk analysis to characterise environmental impacts, whose occurrence and nature are not easy to predict with any degree of accuracy.

secondary impact

Indirect or induced changes in the environment, population, economic growth and land use and other environmental effects resulting from these changes in land use, population and economic growth. The potential effects of additional changes that are likely to occur later in time or at a different place as a result of the implementation of a particular action.

scoping

An early and open activity to identify the impacts that are most likely to be significant and require investigation during the EIA work. Can, also, be used to:

- identify alternative project designs/sites to be assessed;
- obtain local knowledge of site and surroundings; and
- prepare a plan for public involvement.

The results of scoping are frequently used to prepare a Terms of Reference for the EIA.

screening

Preliminary activity undertaken to classify proposals according to the level of assessment that should occur.

social impact assessment

The component of EIA concerned with changes in the structure and functioning of social orderings. In particular the changes that a development would create in: social relationships; community (population, structure, stability etc); people's quality and way of life; language; ritual; political/economic processes; attitudes/values. Can sometimes include health impacts.

stakeholders

Those who may be potentially affected by a proposal eg: local people, the proponent, government agencies, NGOs, donors and others.

State of the Environment reports

Reports that provide an assessment of the conditions of the environment, pressures on the environment and the responses of the environment to those pressures.

strategic environmental assessment

A formal process of systematic analysis of the environmental effects of development policies, plans, programmes and other proposed strategic actions. This process extends the aims and principles of EIA beyond the project level and when major alternatives are still open.

synergistic

By acting together, separate elements produce a greater effect than would be produced if they acted separately.

tiering

Addressing issues and impacts at the appropriate level of decision-making (eg from the policy to project levels).

Terms of Reference (ToR)

Written requirements governing EIA implementation, consultations to be held, data to be produced and form/contents of the EIA report. Often produced as an output from scoping.

transboundary impacts

Any impact, not exclusively of a global nature, within an area under the jurisdiction of a Party caused by a proposed activity the physical origin of which is situated wholly or in part within the area under the jurisdiction of another Party.

value judgement

The use of opinion or belief in analysis or decision-making.