Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)

ENVIRONMENTAL IMPACT ASSESSMENT TRAINING WORKSHOP FOR NGOS

ORGANIZED BY THE
UNIT OF ENVIRONMENTAL IMPACT ASSESSMENT
MINISTRY OF ENVIRONMENT

SPONSORED BY THE WORLD BANK
MEDITERRANEAN ENVIRONMENTAL TECHNICAL ASSISTANCE PROGRAM

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الجمهورية اللبنانية
مكتب وزير الدولة لشؤون التنمية الإدارية
مركز مشاريع ودراسات القطاع العام

ACKNOWLEDGEMENTS

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WORKSHOP OVERVIEW

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		10:00-10:30	*Coffee break*
	2	10:30-12:00	Beirut Urban Transport Project Archaeological impact assessment Social impact assessment Resettlement issues Public participation in environmental decision making
		12:00-12:30	*Coffee break*
	3	12:30-14:00	Environmental policy impact assessment Approaches and prospects for phase-out of leaded gasoline in Lebanon Emission reduction and traffic management EIA and protective areas: Horsh Ehden case study
		14:00-15:00	*Lunch*

A. Ministry of Environment's Welcoming Introduction

Lebanon has been embarking in major infrastructural development activities that have imposed significant stress on the bio-physical and socio-economical environment. It is necessary to prevent further stress in order to protect the environment and avoid the depletion of its natural resources.

Environmental Impact Assessment (EIA) is one tool used by developed countries to achieve such objectives and promote sustainable development. EIA is a decision-making tool that identifies, predicts and evaluates the potential environmental impacts of a proposed project and suggests appropriate measures to reduce the negative impacts and increase the positive ones.

The Ministry of Environment (MoE), in coordination with the Mediterranean Environmental Technical Assistance Program (METAP) and under the administration of the World Bank, is currently establishing the EIA system in Lebanon. This system includes two major components: a legal component that has been addressed by the development of a draft EIA decree; and a training component aiming at building the capacity of the various stakeholders in applying the EIA system. The present workshop is part of this training component.

B. INTRODUCTION TO AND THE ROLE OF EIA

Introduction

The purpose of environmental impact assessment (EIA) is to ensure that development proposals, activities and programs are environmentally sound and sustainable. EIA is a planning process used to predict, analyze and interpret the significant environmental effects of a proposal and to provide information that can be used during decision-making. This role for EIA was formally recognized at the Earth Summit (United Nations Conference on Environment and Development, UNCED) held in Rio in 1992. Rio Principle 17 states that "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."

Use of EIA

EIA can be used to minimize or prevent adverse effects and at the same time help countries to capture the real potential of their resources, maximizing the benefits of a proposed development. It is a process that can:

- ❑ Modify and improve the design of a proposal;
- ❑ Ensure that resources are used efficiently;
- ❑ Enhance the social aspects related to the proposal;
- ❑ Identify measures for monitoring and managing impacts;
- ❑ Facilitate informed decision-making;
- ❑ Provide justification for a proposal.

Best practice EIA has an ongoing role during implementation. As projects are constructed and commissioned, or programs implemented, the environmental consequences can be further minimized by appropriate mitigative and monitoring measures.

Environmental Impacts Variation

In order to manage environmental problems it is necessary to have an understanding of environmental impacts and the different ways in which they can vary (Table B.1).

Table B.1. Variation of environmental impacts

Parameter	*Description*
Type and nature	Impacts can vary in type from the biophysical through to the social, health or economic. They may also vary in nature, being direct or indirect, cumulative, synergistic etc.
Magnitude	In terms of their consequences impacts can range from insignificant (no need for remedial action) to highly significant (requiring remediation and monitoring).
Extent	The impacts may have only a local effect such as the need for additional housing or schooling or they may have regional, transboundary or global significance as in discharge of atmospheric pollutants or significant contributions to greenhouse gases.
Timing	The impacts may be felt immediately or may not be evident for some time. For instance, exposure to carcinogenic chemicals or radiation can be responsible for cancers developing 20 or 30 years later.
Duration	The impact may range from short term, such as noise during construction, through to permanent impacts, as found in the relocation of a village due to inundation during dam construction.
Uncertainty	Impacts can vary in both the likelihood and consequences of occurrence; for instance the likelihood of a major oil spill may be low but the consequences of its occurrence are significant.
Reversibility	Some impacts may be reversible, or able to be rehabilitated upon the decommissioning of a project, while others may be irreversible.
Significance	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 very significant, while even very large impacts may not necessarily be very significant. In determining the significance of the impacts associated with a proposal all of the above factors should be taken into consideration.

Major Trends in EIA

Since its introduction, EIA has undergone a remarkable expansion and is now widely used as an approach for development planning and management. EIA has continued to evolve through innovations in law, procedure and methodology. The evolution of EIA can be divided into four main phases (Sadler, 1995):

- *Initial development (early 1970s):* introduction of basic principles, institutional arrangements and analytical techniques for conducting EIA;
- *Expanding scope (later '70s, early '80s):* progressive inclusion of social, risk, health and related factors, improved opportunities for public participation, greater focus on impact management;
- *Process redirection (mid-late '80's):* increasing efforts to address cumulative effects, to integrate project-level EIA with policy, planning and regulatory frameworks, and to establish monitoring, audit and other follow-up procedures; and
- *Toward a sustainability paradigm (to date):* development of strategic environmental assessment (SEA), new requirements for EIA established by international conventions (eg. biodiversity), introduction of consensus-based dispute settlement procedures.

International Developments in EIA in the 1990s

Recent international developments that contributed towards the progress of EIA include: (Sadler, 1995)

- Major reforms were made or are pending to well-established EIA systems (eg. Australia, New Zealand, Canada);
- The European Community Directive on EIA (1985) was widely implemented and has driven domestic reform in UK and other member states;
- The World Bank and other development assistance agencies established EIA policies and procedures and introduced the process to many developing countries;
- The ESPOO Convention (UN Economic Commission for Europe [UNECE] Convention on EIA in a Transboundary Context, 1991) identified principles and provisions for EIA of projects and activities with transboundary effects; and
- Additional requirements were placed on EIA by the UN Conventions on Climate Change and Biological Diversity (1992).

The EIA Process

The EIA process the EIA process is described in Table B.2 and shown in Figure B.1.

Table B.2. Description of the EIA process components

Component	*Description*
Screening	An initial assessment to decide whether a project requires further investigation in an EIA.
Scoping	To identify the key impacts requiring further investigation, and prepare the terms of reference for the study.
Assessing	The identification, analysis and evaluation of the significance of impacts.
Mitigating	Developing measures to prevent, reduce or compensate for impacts and to make good environmental damage.
Reporting	Presenting the results of the impact assessment in a useful format.
Reviewing	Assessing the adequacy of the EIA report, taking account of the points of view of stakeholders and assessing the acceptability of the proposal in terms of existing plans, policies and standards.
Decision-making	To decide whether the proposal can proceed and under what conditions. The decision-maker has the option to request that the project be redesigned (or aspects of the project redesigned) so that the environmental effects are minimized.
Monitoring and Managing	Implementing mitigation measures, monitoring impacts for compliance, checking that they are as predicted. Where necessary taking action to ameliorate problems.
Public Involvement	Happens typically during the scoping and reviewing phases of EIA but may also occur at any of the other stages of the EIA process. Public involvement programs can range in purpose from those that aim only to provide the public with information, through to those that encourage the full involvement of the public in the decision-making process. Public involvement must be carried out in a manner that is appropriate to the culture of the people concerned.

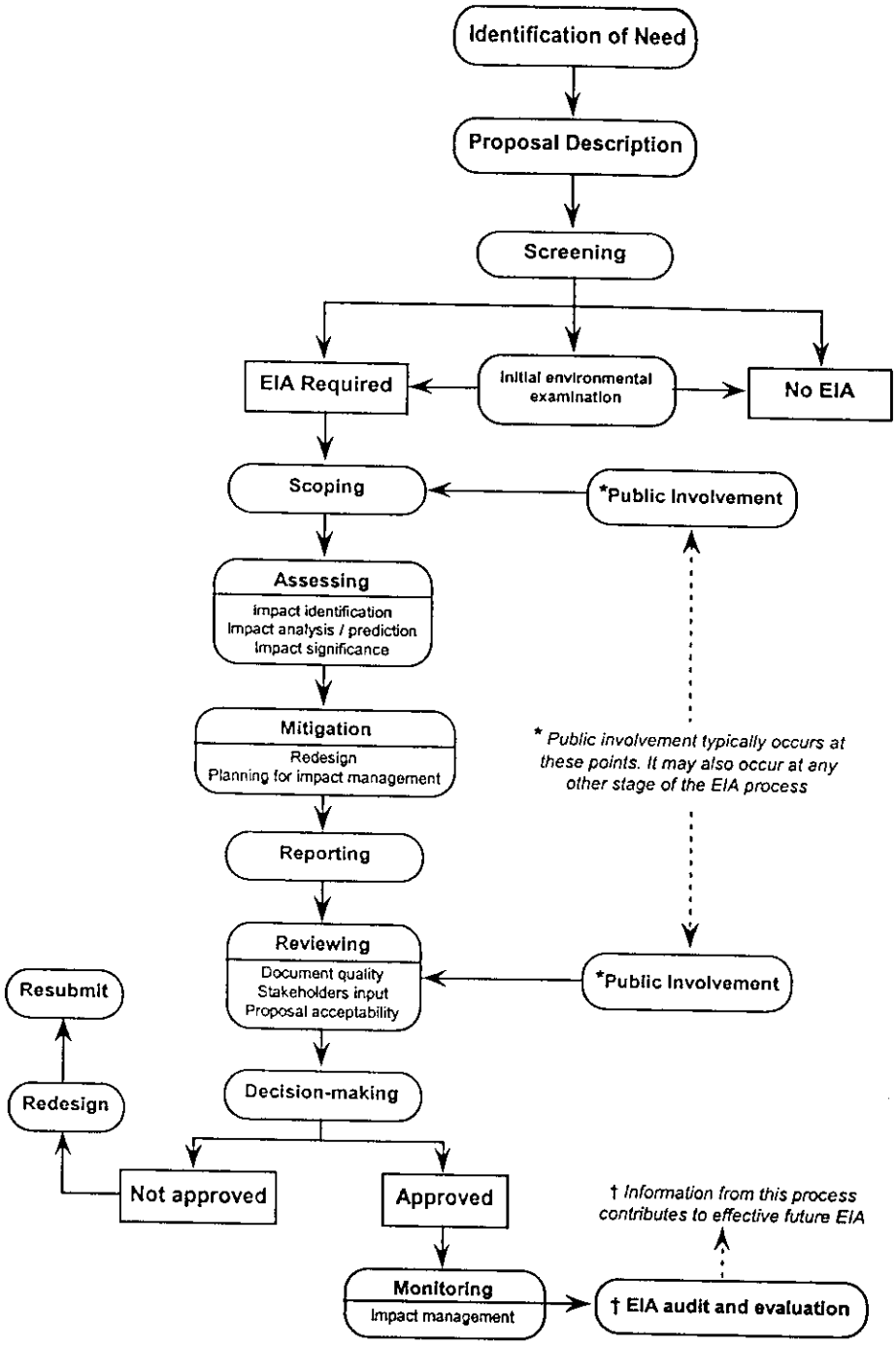

Figure B.1. General EIA process flowchart

Costs of an EIA

It can be difficult to determine the exact costs of undertaking an EIA because major projects require a large number of initial investigations even without an EIA. The World Bank (1991) notes that the cost of preparing an EIA rarely exceeds one per cent of the project costs and even this relatively low cost can be reduced further if local personnel are used to do most of the work. Clark (1984) estimates EIA costs of 0.5-2.0% of project value. Hart (1984) and Wathern (1988) suggest figures of a similar order. More recent estimates by Cole *et al.* (1992) Suggest a much wider range, from 0.000025% to 5%, in the UK. The costs 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.

Benefits of EIA

In general the benefits of EIA include:

- *More environmentally sustainable design or improvements in the design and siting of a plant:* carrying out an EIA entails an analysis of possible alternatives in the design and siting of projects. This results in an overall improvement in the general state of the environment and location of projects. A well designed project can also minimize the risk of project-induced disease and the associated costs of treatment or compensation;
- *Better compliance with environmental standards:* compliance with environmental standards reduces disruption and damage to the environment and reduces the likelihood of fines and penalties;
- *Savings in capital and operating costs:* costs can escalate if environmental problems have not been considered at the beginning and require rectification later. This may involve adopting some expensive mitigation measures or reducing the size or output of the project. The chances of expensive late changes can be minimized by carrying out an EIA at the earliest stages of the project cycle;
- *Reduced time and costs of approvals of development applications:* if all environmental concerns have been taken into account before submission for project approval, then it is unlikely that delays will occur; and
- *Increased project acceptance by the public:* this is achieved by public involvement throughout the process.

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C. The First Stage: Typical Project Definition and Screening

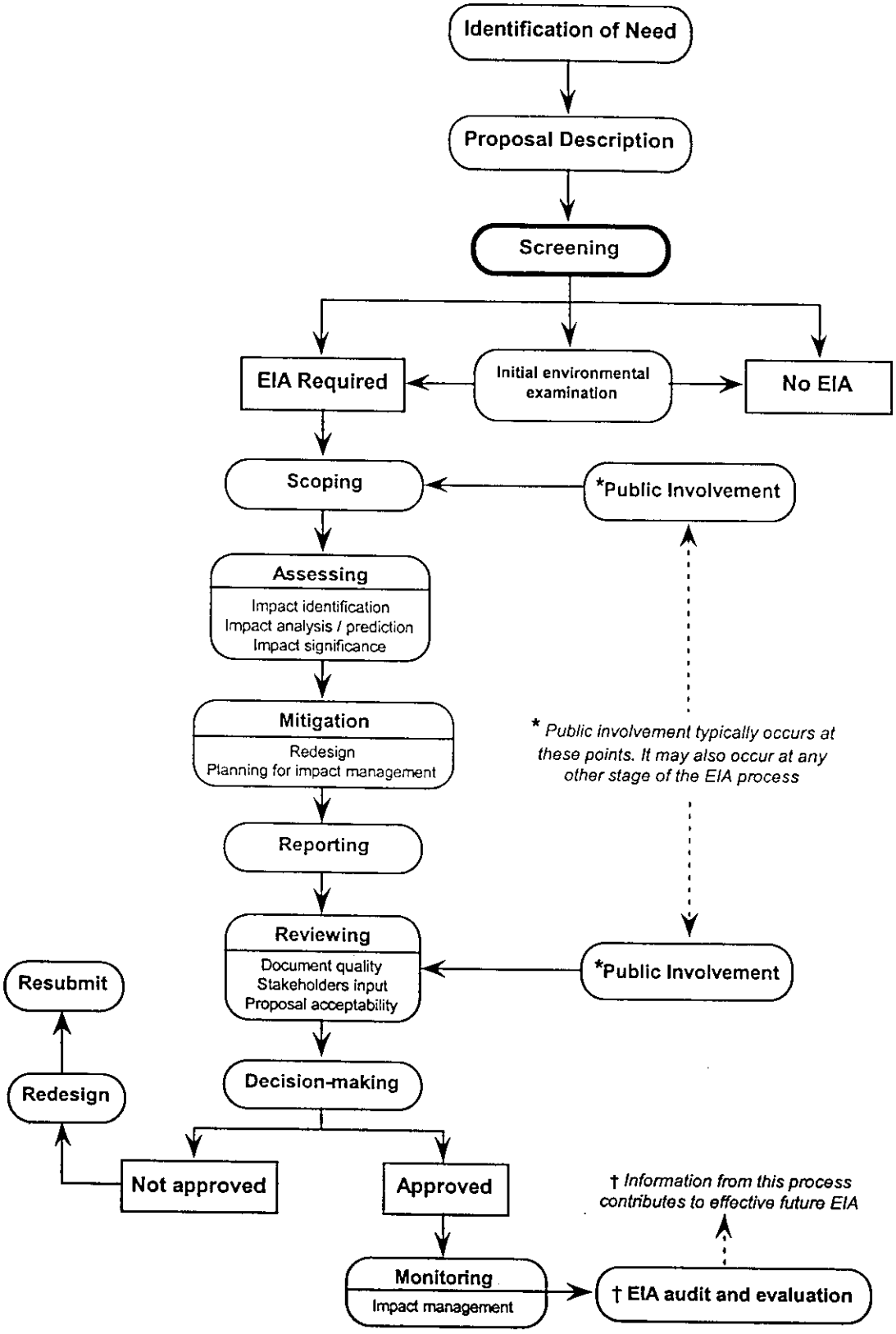

Figure C.1. Screening in the EIA process

Introduction

Screening (Figure C.1) is the process of determining whether or not an individual proposal requires detailed environmental assessment (full-scale EIA). It also involves judging whether or not the expected impacts of a proposal on the environment are likely to be of significance. Full-scale EIA is typically required for proposals, which involve (OECD, 1992):

- Exploitation of natural resources
- Infrastructure
- Industrial activities
- Extractive industries
- Waste management and disposal, and
- Substantial changes in farming or fishing practices

Screening Methods

The choice of screening method is usually determined by the policy decision-makers when an EIA system is established. All screening methods require information about the proposal and all of them have involved the subjective use of value judgements at some stage during their development. Approaches to screening involve one, or a combination of, the following techniques:

- Decision-makers' discretion;
- Initial environmental examination;
- Project lists with/without thresholds; and
- Exclusion lists.

Decision-maker's discretion

This approach covers a range of situations where the need for EIA is individually assessed on a case-by-case basis. The use of screening criteria requires information to be provided to, or acquired by, the body making the screening decision. This information can relate to:

- The proposal itself and its potential impacts;
- The level of confidence in the predicted impacts;
- The characteristics of the receiving environment and its resilience to change;
- The existing planning, environmental management and decision-making framework; and
- The degree of likely public interest in the proposal.

Initial environmental examination (evaluation)

Initial environmental examinations (IEE) are low-cost environmental evaluations that make use of information already available. The IEE includes:

- Description of the proposal and examination of alternatives that might improve environmental outcomes;
- Identification of the concerns of the local community;
- Identification and assessing of potential environmental effects;
- Mitigation of adverse effects and enhancement of potential benefits; and
- Environmental monitoring and management plans.

Project lists

Project lists establish a set of specific criteria that can be used to determine which projects will undergo an EIA. Project lists are structured so that they identify the projects:

- Requiring full-scale EIA;
- Requiring some form of further environmental analysis; or
- Not requiring any further environmental analysis.

When developing project lists care should be taken not to adopt those established in other jurisdictions without adequate review of their suitability. It is also preferable that there is some form of consultation between government, agencies, industry and the public during the development, or revision, of project lists.

Exclusion lists

All proposals are made subject to an EIA unless they can show that they should not be. The use of exclusive lists is not a common approach to screening.

Outcomes

There are usually three possible outcomes of screening processes:

- Proposals which do not require additional environmental investigation because it is expected that they will not have a significant impact;
- Proposals which require a limited environmental study because the environmental impacts are known and can be easily mitigated; and
- Proposals which require an EIA to determine the extent and magnitude of a range of significant adverse impacts and to propose appropriate mitigation, monitoring and management measures.

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وزارة البيئة في لبنان: مشروع مرسوم تقييم الأثر البيئي (أيلول ٢٠٠٠)

ملحق رقم ١: المشاريع التي تستلزم حكما تقرير تقييم أثر بيئي

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- إنشاء السدود والبحيرات الاصطناعية والمستنقعات
- مشاريع الري إذا زادت مساحتها عن ٥٠٠ هكتار

٢. مياه الشفة:
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- المشاريع المتكاملة المتعلقة بتزويد مياه الشفة

٣. المياه المبتذلة:
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- إنشاء قنوات التصريف البحرية
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٢٧٥١	خدمات صب الحديد	
٢٧٥٣	خدمات صب المعادن الخفيفة	
٢٧٥٤	خدمات صب معادن أخرى غير حديدية	
٢٩	**صناعة الآلات (الماكينات)**	
٢٩٦٠	سلاح وذخيرة	
٣١	**إنتاج آلات ومعدات كهربائية مختلفة**	
٣١٤٠	مركبات وبطاريات من الخلايا الأولية، خلايا أولية	إنتاج
٣٤	**صناعة عائدة للمواصلات**	
٣٤١٠	إنتاج سيارات	
٣٤٢٠	صنع عربات وكروسري للسيارات والشاحنات والمقطورات	
٣٥	النقل	
٣٥١١	بواخر	
٣٧	**إعادة تصنيع**	
٣٧١٠	إعادة تصنيع الدهان	
٣٧٢٠	إعادة استعمال النفايات غير المعدنية	

تفسير الرموز الواردة في الجدول	
ISIC	International Standard for Industrial Code
م.ع.	مساحة عمل م٢
ط.ا.	طاقة إنتاجية
ط.م.	طاقة المحرك
=<	يعادل أم أكثر
<	أقل من
غ م س	غير مصنف سابقا
س	ساعة
ي	يوم
أ	أسبوع
ع.	عام (سنة)
ط.	طن
ك.و.	كيلووات
م.و.	ميغاوات

ملحق رقم ٢: المشاريع التي تستلزم حكماً تقرير فحص بيئي مبدئي

١. الري والصرف:
- مشاريع الري إذا زادت مساحتها عن ١٠٠ هكتار

٢. مياه الشفة:
- إنشاء محطات معالجة المياه

٣. المياه المبتذلة:
- إنشاء شبكات الصرف الصحي

٤. الزراعة والغابات:
- مشاريع التشجير أو التحريج

٥. النقل:
- إنشاء مواقف متعددة الطوابق (multi-storey parking)
- إنشاء محطات تسفير (terminals)

٦. توليد وتوزيع الطاقة:
- خطوط توزيع الطاقة الكهربائية (التوتر العالي)

٧. النفط والغاز:
- إنشاء محطات توزيع المشتقات النفطية

٨. إنشاء المستشفيات

٩. المشاريع السياحية والترفيهية:
- إنشاء أي مشروع سياحي أو ترفيهي بما فيه الفنادق والمجمعات البحرية والمنتزهات والمحميات

١٠. المشاريع السكنية:
- إنشاء المباني العالية (التي تزيد عن خمسة عشر طابقاً)
- إنشاء المجمعات السكنية

١١. المزارع المصنفة فئة أولى وثانية

١٢. المصانع:
- الصناعات المذكورة في الجدول أدناه:

الرقم ISIC	الصنف/ المادة	
د	صناعة	
١٥	صناعة المواد الغذائية	
١٥١١	لحوم طازجة ومحفوظة (لا تشمل الطيور الداجنة والمسالخ)	
١٥١٢	لحوم الطيور الداجنة – طازجة ومحفوظة لا تشمل المسالخ	
١٥١٣	تصنيع منتجات اللحوم بجميع أصنافها	
١٥٢٠	منتجات سمكية محفوظة مصنعة	
١٥٣١	بطاطا مصنعة ومحفوظة	
١٥٣٢	عصير الخضار والفواكه [أنظر المرسوم رقم ١٠٨/٨٣]	
١٥٣٣	خضار وفواكه مصنعة ومحفوظة – غ م س	ط.أ. > ٢٥٠٠٠ ط/ع ط.أ. => ٢٥٠٠٠ ط/ع
١٥٤١	زيوت وشحوم خام	نباتي حيواني
١٥٤٢	زيوت وشحوم مكررة	نباتي حيواني
١٥٥١	صناعة مشتقات الحليب	ما بين ١ طن و ٢,٥ طن/ى ط.أ. => ٢,٥ طن/ى
١٥٥٢	البوظة والمثلجات المعدة للاستهلاك [أنظر المرسوم رقم ١٠٨/٨٣]	ما بين ١ طن و ٢,٥ طن/ى ط.أ. => ٢,٥ طن/ى
١٥٦١	نتاج مطاحن الحبوب	ط.أ. < ٥ ط/س ط.أ. => ٥ ط/س
١٥٦٢	النشويات والمنتجات النشوية	ط.أ. < ٥ ط/س ط.أ. => ٥ ط/س
١٥٧١	علف مصنع للحيوانات الداجنة	نباتي حيواني : خلط
١٥٧٢	أغذية معدة للحيوانات المنزلية	
١٥٨٢	بسكويت وحلويات محفوظة	
١٥٨٤	كاكاو، وشوكولاته وسكاكر	
١٥٨٥	معكرونة، شعيرية وغيرها من المعجنات صناعة	
١٥٨٦	بن وشاي	تحميص البن
١٥٨٩	منتجات غذائية أخرى	
١٥٩١	مشروبات كحولية مقطرة	انتاج < ١٠٠٠٠ ليتر /ع انتاج => ١٠٠٠٠ ليتر /ع تعبئة بالقناني
١٥٩٢	كحول الأتيل	
١٥٩٣	خمور	انتاج < ١٠٠٠٠ ليتر/ع انتاج- > ١٠٠٠٠ ليتر/ع تعبئة بالقناني
١٥٩٦	بيرة	
١٥٩٨	مياه معدنية ومشروبات غير كحولية [أنظر المرسوم رقم ١٠٨/٨٣]	
١٦	منتجات التبغ	
١٦٠٠	منتجات التبغ	(سجاير دون سيجار)
١٧	المنتجات النسيجية	
١٧١٠	نسيج وخيوط ، غزل وتصنيع الصوف استعمال مواد كيماوية او قابلة للاشتعال (تبيض ، صباغ ، مرجل بخاري)	طاقة => ٢٥ ك و محركات

١٧٢٠	الأقمشة النسيجية (حياكة)	طاقة => ٢٥ ك و محركات استعمال مواد كيماوية او قابلة للاشتعال (تبيض او صباغ)
١٧٣٠	خدمات تكميلية نسيجية	تبييض أو صباغ خدمات اخرى
١٧٤٠	منتجات نسيجية مصنعة (لا تشمل الالبسة)	٢٥ ك و < طاقة < ١٠٠ ك و محركات طاقة => ١٠٠ ك و محركات
١٧٥١	سجاد وموكيت	ما بين ٢٥ ك و و ١٠٠ ك و طاقة => ١٠٠ ك و محركات
١٧٥٢	حبال ومرمى جدل وتشبيك	
١٧٥٤	خلافه من النسيج – غ م س	
١٧٦٠	أقمشة محاكة أو مطرزة أو محبوكة	
١٧٧١	جوارب وكولون محاكة او محبوكة	ط.أ. ٢٥ ك و محركات استعمال مواد كيماوية قابلة للاشتعال (تبيض ، صباغ ، مرجل بخاري)
١٨	**صناعة الملابس والمواد وصبغ الفرو**	
١٨١٠	ملابس جلدية (دون تصنيع)	ط.أ. = < ٣٥ ك و محركات
١٨٢١	ملابس عمل	ط.أ. => ٣٥ ك و محركات
١٨٢٢	ملابس خارجية	ط.أ. = < ٣٥ ك و محركات
١٨٢٣	ملابس داخلية	ط.أ. => ٣٥ ك و محركات
١٨٢٤	ملابس مختلفة واكسسوارتها – غ م س	ط.أ. => ٣٥ ك و محركات
١٨٣٠	فرو ومشتقاته	ط.أ. => ٣٥ ك و محركات
١٩	**صناعة الجلود**	
١٩٢٠	شنط وحقائب وأسرجة وبراذع وأحزمة (دون تصنيع الجلد)	طاقة => ٢٥ ك و محركات
١٩٣٠	أحذية على اختلافها (لا يشمل تصنيع الجلد)	طاقة => ٣٥ ك و محركات – تصنيع لوازم الاحذية من لدائن ومركبات كيميائية
٢٠	**صناعة المفروشات والخشب**	
٢٠١٠	خشب منشور أومقشوط	طاقة => ١٠٠ ك و (استعمال مواد مذيبة)
٢٠٢٠	ألواح من الخشب المضغوط أو المعاكس او الفاينر وغيره	طاقة = > ١٠٠ ك و (استعمال مواد مذيبة)
٢٠٣٠	نجارة التركيب والتوصيل	طاقة => ١٠٠ ك و
٢٠٤٠	حاويات خشبية	طاقة => ١٠٠ ك و
٢٠٥١	منتجات خشبية أخرى	طاقة => ١٠٠ ك و
٢١	**صناعة الورق**	
٢١١٢	الورق والكرتون	استعمال مواد كلورية - بدون مواد كلورية
٢١٢١	منتجات التغليف والتعبئة من الكرتون المموج	
٢١٢٢	المنتجات الورقية للاستعمال المنزلي	
٢١٥٢	منتجات مختلفة من الورق والكرتون – غ م س	
٢٢	**النشر والطباعة ووسائل الإعلان**	
٢٢١١	كتب	طباعة طباعة مع تجفيف بالناز
٢٤	**الصناعات الكيماوية**	

٢٤١٢	صبغ وخضب	
٢٤٣٠	دهانات وفارنيش وغيرها من الطلاءات، حبر طباعة وعلك مزج الطلاء والحبر والدهان	
٢٤٤١	منتجات طبية أساسية [أنظر المرسوم رقم ٨٣/١٠٥]	
٢٤٤٢	تحضيرات طبية [أنظر المرسوم رقم ٨٣/١٠٥]	
٢٤٥١	مستحضرات الصابون ومساحيق التنظيف والتطهير والتلميع	
٢٤٥٢	المستحضرات العطرية ولوازم الزينة	
٢٤٦٢	صمغ وجيلاتين	من المواد الحيوانية الخام دون مواد حيوانية خام
٢٤٦٤	مواد كيماوية للتصوير	
٢٤٦٦	مواد كيماوية أخرى – غ م س	
٢٥	المطاط والبلاستيك	
٢٥١١	اطارات وانابيب من الكاوتشوك	
٢٥١٢	إطارات وأنابيب من الكاوتشوك معاد تصنيعها	
٢٥١٣	منتجات مطاطية أخرى	
٢٥٢١	ألواح وأنابيب وسحب البرافيل بلاستيكية	
٢٥٢٢	منتجات بلاستيكية(للصر) والتغليف	
٢٥٢٣	ثياب بلاستيكية واقية	
٢٥٢٤	مواد بلاستيكية أخرى	
٢٦	مواد بناء	
٢٦١١	زجاج مسطح	طاقة < ١٠٠ ك و طاقة => ١٠٠ ك و
٢٦١٢	زجاج مسطح مصنع ومشغول	طاقة < ١٠٠ ك و طاقة => ١٠٠ ك و
٢٦١٣	زجاج مفرغ	طاقة < ١٠٠ ك و طاقة => ١٠٠ ك و
٢٦١٥	زجاج مصنع على أنواعه بما فيه المعدات الزجاجية التكنيكية	طاقة < ١٠٠ ك و طاقة => ١٠٠ ك و
٢٦٢١	أدوات منزلية وتزيين من سيراميك (خزفية)	طاقة < ١٠٠ ك و طاقة => ١٠٠ ك و
٢٦٢٢	أدوات صحية سيراميك	
٢٦٢٤	أدوات سيراميك فنية	
٢٦٢٦	منتجات سيراميك حرارية (مقاومة للحرارة)	
٢٦٣٠	بلاط وقنائي سيراميك	
٢٦٤٠	بلاط وحجارة ومنتجات قرميدية مصنعة من الطين المجفف	
٢٦٦١	مصبوبات الاسمنت للبناء	دون مكابس وآلات ارتجاج مع مكابس وآلات ارتجاج
٢٦٦٢	منتجات جبسية للبناء	
٢٦٦٣	باطون للخلط	ط.أ. < ٥٠ ط/ي ط.أ. => ٥٠ ط/ي
٢٦٦٦	منتجات أخرى من الجبس والباطون الاسمنتي	
٢٦٧٠	حجارة للمباني التذكارية	
٢٦٨٠	منتجات منجمية أخرى غير معدنية – غ م س	دون اسبست
٢٦٨١	منتجات حاكة (منغرة)	
٢٦٨٢	منتجات منجمية أخرى غير معدنية – غ م س	
٢٧	صناعة المعادن الأولية	
٢٧٣١	منتجات حديدية مسحوبة على البارد	م.ع>١٠٠٠ متر٢

		م.ع=>١٠٠٠ متر٢
٢٧٣٢	لوحات رفيعة مدلفنة على البارد	م.ع<١٠٠٠ متر٢ م.ع=>١٠٠٠ متر٢
٢٧٣٤	شريط معدني	م.ع<١٠٠٠ متر٢ م.ع=>١٠٠٠ متر٢
٢٧٤٢	ألمنيوم تجميع	
٢٨	**المنتجات المعدنية والكهربائية الفنية**	
٢٨١١	المنشآت المعدنية وأجزاءها	
٢٨١٢	الحدادة والتوصيلات المعدنية	
٢٨٢١	الخزانات والحاويات المعدنية	
٢٨٢٢	رديأتورات وغلايات للتدفئة المركزية	
٢٨٣٠	مولدات البخار (لا تشمل غلايات التدفئة المركزية)	
٢٨٤٠	خدمات تحديد، كبس، دك وتسوية سحب المعادن – مينالورجيا المساحيق	
٢٨٥١	خدمات معالجة طلاء المعادن	-كهربائي - غير كهربائي
٢٨٦١	أدوات القطع	
٢٨٦٢	عدة	
٢٨٦٣	أقفال ومفصلات	
٢٨٧١	براميل فولاذية وأوعية مشابهة	
٢٨٧٢	أوعية من المعادن الخفيفة	
٢٨٧٣	منتجات سلكية	مع عوازل كيمائية
٢٨٧٥	منتجات معدنية مصنعة أخرى – غ م س	
٢٩	**صناعة الآلات (الماكينات)**	
٢٩١١	محركات وتربينات (لا يشمل الطيران، السيارات، المحركات الدورية)	
٢٩١٢	مضخات وكمبرسورات	
٢٩١٣	صمامات وحنفيات	
٢٩١٤	محملات، تروس ومسننات وعناصر دافعة	
٢٩٢١	مواقد ومحارق	
٢٩٢٢	معدات رفع وعمل	
٢٩٢٣	معدات تبريد وتهوئة غير منزلية	
٢٩٢٤	آلات ومعدات لاستعمالات مختلفة – غ م س	
٢٩٣١	جرارات زراعية	
٢٩٣٢	الات زراعية وحرجية أخرى	
٢٩٤٠	عدة مكينات	
٢٩٥١	الات للأعمال المعدنية	
٢٩٥٢	آلات للتنجيم والمقالع والبناء	
٢٩٥٣	آلات لتصنيع المشروبات والأغذية والتبغ	
٢٩٥٤	آلات للنسيج والألبسة والأعمال الجلدية	
٢٩٥٦	آلات لاستعمالات مختلفة – غ م س	
٢٩٧١	أجهزة كهربائية منزلية	ط.أ. => ٥٠ ط/ع
٢٩٧٢	أجهزة منزلية غير كهربائية	ط.أ. => ٥٠ ط/ع
٣٠	**كمبيوتر وآلات مكتبية**	
٣٠٠١	إنتاج آلات مكتبية	
٣٠٠٢	إنتاج كمبيوتر (للحاسوب)	
٣١	**إنتاج آلات ومعدات كهربائية مختلفة**	
٣١١٠	محركات كهربائية، مولدات ومحولات	
٣١٢٠	توزيع الكهرباء وأجهزة التحكم	

٣١٣٠	أسلاك وكابلات معزولة	
٣١٥٠	معدات ومصابيح إنارة	
٣١٦١	معدات كهربائية للمحركات وللسيارات – غ م س	
٣١٦٢	معدات كهربائية مختلفة – غ م س	
٣٢	**صناعة الأجهزة السمعية والبصرية (الفيديو) والاتصالات**	
٣٢١٠	صمامات وأنابيب اليكترونية وغيرها من العناصر الاليكترونية	
٣٢٣٠	أجهزة التسجيل والبث ومشتقاتها	
٣٣	**معدات طبية وبصرية**	
٣٣١٠	معدات طبية وجراحية	
٣٣٤٠	أجهزة بصرية ومعدات فوتوغرافية	
٣٤	**صناعة عائدة للمواصلات**	
٣٤٣٠	قطع وأكسسوار للسيارات ومحركاتها	ط.أ. < ٥٠ ط/ع ط.أ. => ٥٠ ط/ع
٣٥	**النقل**	
٣٥٤٣	عربات للمعوقين	
٣٥٥٠	وسائل نقل اخرى – غ م س	
٣٦	**صناعة أدوات وتجهيزات مختلفة**	
٣٦١١	كراسي ومقاعد	ط.أ. => ٥٠ ط/ع
٣٦١٢	تجهيزات مكتبية ومتاجر	ط.أ. => ٥٠ ط/ع
٣٦١٣	تجهيزات مطبخية	ط.أ. => ٥٠ ط/ع
٣٦١٤	مفروشات وتجهيزات مختلفة	ط.أ. => ٥٠ ط؟ع
٣٦١٥	فرش	ط.أ. => ٥٠ ط/ع
٣٦٢٢	مجوهرات وتوابعها – غ م س	ط.أ. => ٥٠ ط/ع
٣٦٤٠	لوازم ومعدات رياضية	ط.أ. => ٥٠ ط/ع استعمال مواد كيماوية او مواد قابلة للاشتعال
٣٦٥٠	ألعاب	ط.أ. => ٥٠ ط/ع استعمال مواد كيماوية او مواد قابلة للاشتعال
٣٦٦٣	منتجات مصنعة أخرى – غ م س	

تفسير الرموز الواردة في الجدول	
International Standard for Industrial Code	ISIC
مساحة عمل م٢	م.ع.
طاقة إنتاجية	ط.أ.
طاقة المحرك	ط.م.
يعادل أم أكثر	=>
أقل من	<
غير مصنف سابقا	غ م س
ساعة	س
يوم	ي
أسبوع	أ
عام (سنة)	ع.
طن	ط.
كيلووات	ك.و.
ميغاوات	م.و.

HANDOUT C-2

SCREEN LIST A: Projects requiring no Environmental Analysis

(CEC, 1993)

DG VII Sectoral Classification	
SOCIAL INFRASTRUCTURE AND SERVICES	
1. Education	❑ Educational facilities (small-scale)
	❑ Teaching facilities and equipment
	❑ Scholarships and conferences
	❑ Teaching staff and resource personnel
	❑ Audio-visual productions
	❑ Training
2. Health	❑ Medical centers (small-scale)
	❑ Medical supplies and equipment
	❑ Medical staff and community health workers
	❑ Training
	❑ Nutrition
3. Population	❑ Family planning
ECONOMIC INFRASTRUCTURE AND SERVICES	❑ Telecommunication
	❑ Research
PRODUCTION SECTOR	❑ Trade (except trade in tropical hardwoods, endangered species, hazardous materials)
MULTI SECTOR	❑ Micro-projects/programs (small-scale capital and service)
FINANCIAL ASSISTANCE	❑ Program assistance (general and sectoral import programs)
	❑ 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

SCREEN LIST B: Projects requiring further Environmental Analysis

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 Harbors	❑ Inland ports which permit the passage of vessels under 1350 tons
		❑ Upgrading of port or harbor 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. Mechanization, mixed cropping)
		❑ Widespread introduction of new crops
		❑ Pest control programs (large scale)
		❑ Widespread introduction of fertilizers
		❑ 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)
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 utilizing 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

SCREEN LIST C: Projects requiring a full Environmental Impact Assessment

SOCIAL INFRASTRUCTURE AND SERVICES		
1.	Rural and Urban Water Supply and Sanitation	❑ Canalization 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 programs
		❑ 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 Harbors	❑ Trading ports
		❑ Ports for inland waterways traffic which permit the Passage of vessels over 1350 tons
		❑ Large scale expansions to existing ports and harbors
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
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 tons 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)

D. Planning and Management of Environmental Impact Studies
Scoping, Terms of References

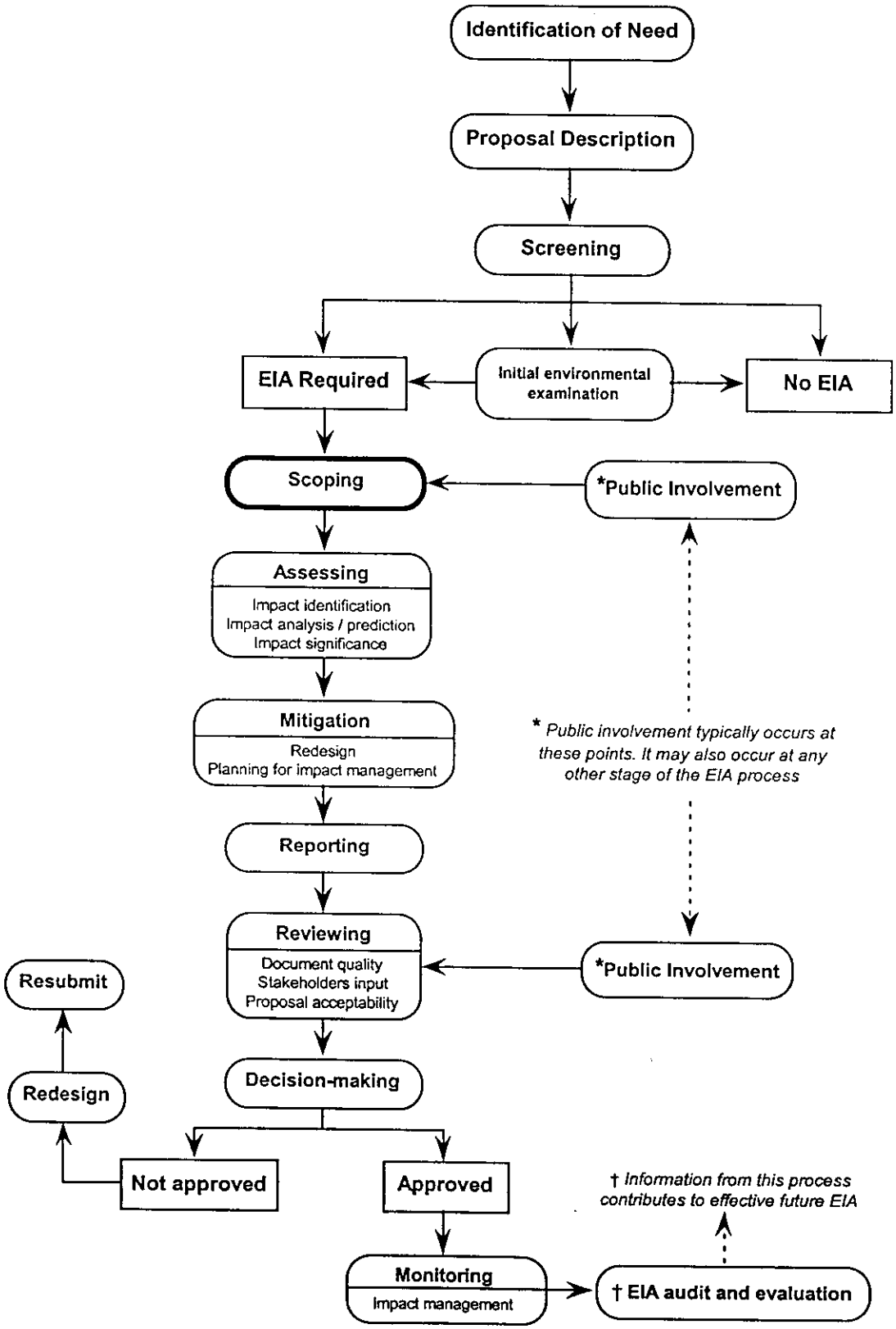

Figure D.1. Scoping in the EIA Process

Introduction

Scoping (Figure D.1) is a process of interaction between the interested public, government agencies and proponents. It refers to the process of identifying, as early as possible (Sadler, 1995):

- Appropriate boundaries of an EIA study
- Important issues and concerns (interests)
- Information necessary for decision making, and
- Significant effects and factors to be considered.

Scoping is a process within which various methods are applied to (FEARO, 1987):

- Identify community and scientific concerns about a proposed project or action;
- Evaluate these concerns to determine the key issues for the purpose of the environmental impact assessment (and to eliminate those issues which are not significant); and
- Organize and communicate these to assist in the analysis of issues and the ultimate making of decisions.

Objectives

The scoping process will serve to facilitate an efficient EIA process by identifying key issues, concerns and alternatives which require investigation. It is done to make sure that neither time nor money is wasted collecting unnecessary baseline data or undertaking excess analysis, and that important issues are not neglected. It is also used to (Ministry for the Environment, 1992):

- Consider reasonable and practical alternatives;
- Inform potentially affected people of the proposal and the alternatives;
- Identify the possible effects on the environment of the proposal and the alternatives;
- Identify the possible effects on people of predicted environmental changes;
- Understand the values about the quality of the environment held by individuals and groups that might be affected by the proposal and the alternatives;
- Evaluate concerns expressed and the possible environmental effects for the purpose of determining how and whether to pursue them further;
- Define the boundaries of any required further assessment in time, space and subject matter;
- Determine the nature of any required further assessment in terms of analytical methods and consultation procedures;
- Organize, focus and communicate the potential impacts and concerns, to assist further analysis and decision-making; and
- Establish the Terms of Reference to be used as the basis of the ongoing assessment.

Scoping Steps

Scoping consists of several steps:

1. Prepare an outline of the scope, with headings such as:
   - Objectives and description of the proposal;
   - The context and setting of the proposal;
   - Constraints;
   - Alternatives;
   - Issues;
   - Public involvement (in scope); and
   - Timetable.
2. Further develop the outline of the scope through discussion with the proponent, the EIA authority, and other key stakeholders, assembling available information, and identifying information gaps.
3. Make the outline and supporting information available to those whose views are to be obtained.
4. Identify the issues of concern.
5. Evaluate the concerns from both a technical and subjective perspective, seeking to assign priority to the more important issues.
6. Amend the outline to incorporate the agreed suggestions.
7. Develop a strategy for addressing and resolving each key issue, including information requirements and terms of reference for further studies.
8. Provide feedback on the way comments have been incorporated.

Parties Involved

Many parties are involved in scoping. These include:

- *The proponent*: knows most about the proposal, and will have a strongly developed view about the factors that will influence the site selection and other decision-making. The scoping process will assist the proponent to recognize the perspective of others, to consider alternatives and issues of concern which are raised by those affected, and to make changes to the proposal which will both address the concerns raised and improve the proposal.
- *The administering authority*: will generally have a statutory or procedural requirements for scoping, and usually a wealth of experience. It may issue directions on the scope of the EIA, or may review and approve the scope of the EIA proposed by the proponent.
- *Other agencies*: will contribute detailed knowledge about specific issues within their jurisdiction. This knowledge may include specific legislation and policy frameworks, standards, data collections, methodologies, local knowledge and experience.
- *Environmental practitioners and experts*: may act for the agencies involved, the proponent, or consultants bidding for the work. They have a particular assistance in providing specialist knowledge.
- *Those affected*: by the proposal have a major role in identifying issues and ensuring that local knowledge and values are understood. The views of these people should be taken into account in choosing between alternatives, in deciding on the importance of issues, and in framing mitigating measures, compensation provisions and management plans.
- *The wider community*: including those indirectly affected, and local, national and sometimes international NGOs and interest groups will also provide a source of useful information and values, as this can assist the thoroughness of the scoping.

Alternatives

Alternatives are generated and examined to determine the best method of achieving project objectives, while minimizing environmental impacts. They can be grouped under such headings as (Tomlinson 1984):

- Demand alternatives (e.g. Using energy more efficiently rather than building more generating capacity);
- 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 the processing plant for a mine);
- Process alternatives (e.g. The re-use of process water in an industrial plant, waste-minimizing or energy efficient technology, different mining methods);
- Scheduling alternatives (where a number of measures might play a part in an overall program, but the order in which they are scheduled will contribute to the overall effectiveness of the end result); and
- Input alternatives (e.g. raw materials, energy sources).

Knowledge of available technology, policy and societal attitudes, site constraints, project economics and evaluation methods will all contribute to the development of alternatives which warrant further consideration. The 'no build' alternative is often used as a base case against which to measure the relative performance of other alternatives. Not all alternatives will be investigated in the same detail. It is quite common to undertake a preliminary analysis of a wide set of alternatives to decide which ones should be carried forward for further consideration, and which ones should be discarded.

Outcomes

Terms of Reference (TOR) for the EIA are a common outcome of the scoping phase, and should clearly identify the work to be done and responsibility in undertaking the EIA study whilst maintaining some flexibility to adapt to changes if necessary. The main components of TORs are:

- Background to the proposal;
- Setting the context for the problem (proposed solution, cooperation amongst jurisdictions, objectives of the eia, legal/policy basis and institutional capacity for eia);
- Alternatives (to the project, within the project);
- Institution and public involvement;
- Required information and data (project description, description of environment, quality of information);
- Analysis of impacts (positive, negative: natural resources, human resources, relocation and compensation, cumulative impacts, trans-boundary impacts, impact significance);
- Mitigation and monitoring (impact management plan, environmental monitoring plan); and
- Conclusions and recommendations (project decision, technical matters, non-technical summary).

TORs also contain various matters relating to project management, such as:

- Proposed study schedule;
- Budget allowed for the study;
- Expected outputs (interim and final reports, format of the environmental impact statement, number of copies); and
- Basis on which variations to the brief will be negotiated.

Reference List

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

Federal Environmental Assessment Review Office (FEARO). 1987. *Determining the Scope of Environmental Impact Assessments.* Environmental and Social Systems Analysts Ltd., Vancouver.

Ministry for the Environment. 1992. *Scoping of Environmental Effects.* Wellington, New Zealand.

Sadler B. 1995. *Initial Perspectives on EIA Process Strengthening.* International Study of the Effectiveness of Environmental Assessment. Canadian Environmental Assessment Agency (CEAA) and International Impact Assessment Association (IAIA), Canada.

Tomlinson P. 1984. The Use of Methods in Screening and Scoping. In *Perspectives in Environmental Impact Assessment.* B.D. Clarke *et al,* eds. D. Reidel, Dordrecht, pp. 163-194.

United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). 1990. *Environmental Impact Assessment.* Environment and Development Series Guidelines for Transport Development (ST/ESCAP/785), Bangkok.

Further Reading

Australian and New Zealand Environment and Conservation Council. 1993. *Guidelines and Criteria for Determining the Need for, and Level of, Environment Impact Assessment in Australia.* Canberra.

Beanlands G. .1992. Scoping Methods and Baseline Studies in EIA. In *Environmental Impact Assessment Theory and Practice.* Ed. Wathern P. pp. 33-46.

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Organization for Economic Cooperation and Development (OECD) / Development Assistance Committee (DAC). 1994. *Towards Coherence in Environmental Assessment.* Results of the Project on Coherence of Environmental Assessment for International Bilateral Aid, OECD/DAC, Canada.

Sadler B. 1996. *Final Report of the International Study of the Effectiveness of Environmental Assessment.* Canadian Environmental Assessment Agency (CEAA) and International Impact Assessment Association (IAIA), Canada.

US Council on Environmental Quality (CEQ). 1981. *Memorandum: Scoping Guidance.* CEQ, Washington, D.C. 19pp.

World Bank 1991. *Environmental Assessment Sourcebook, Volume III Guidelines For Environmental Assessment of Energy and Industry Projects.* Technical paper number 154. World Bank Environmental Department, Washington, D.C.

World Bank. 1995. *Environmental Assessment Challenges and Good Practice.* Paper no. 18. World Bank, Washington D.C.

United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). 1990. *Environmental Impact Assessment.* Guidelines for Agricultural Development (ST/ESCAP/783); Guidelines for Industrial Development (ST/ESCAP/784); Guidelines for Transport Development (ST/ESCAP/785); Guidelines for Water Resource Development (ST/ESCAP/786). Environment and Development Series, Bangkok:

HANDOUT D-1

General Guidelines for Preparation Of TORs (From NEPA Guidelines)
(UN ESCAP, 1990)

TERMS OF REFERENCE FOR THE PREPARATION OF AN
ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR
PROPOSED (*NAME OF PROJECT*)

OUTLINE

1 Introduction
  1.1 Purpose of terms of reference
  1.2 Responsibility for preparing EIA report

2 General EIA guidelines

3 Background information
  3.1 Specific background studies and reports
  3.2 General background studies and reports

4 Specific EIA guidelines
  4.1 Specific environmental effects
  4.2 Corrective measures
  4.3 Monitoring
  4.4 EIA study proposal
    4.4.1 Work tasks
    4.4.2 Study schedule
    4.4.3 Review sessions
    4.4.4 Printing or reproduction of EIS report
    4.4.5 Study team

5 Time constraints
  5.1 EIA report
  5.2 Proposals for conducting EIA study

6 Budget

7 Outside assistance

8 Additional information

1. Introduction

1.1 Purpose of terms of reference

The purpose of these Terms of Reference (TORs) is to describe the requirements for the environmental impact assessment (EIA) to be prepared by the Agency proposing to undertaking the proposed project, so that the resulting EIA report will lie suitable for review and evaluation by the sponsoring agency (SA) (the agency of the Government responsible for arranging for the EIA to be done) (either the National Environmental Protection Agency (NEPA) or an agency designated by the NEPA). Assuming an adequate EIA report is submitted to the SA, it will be able to evaluate and quantify the effects of the project in environmental values and thus to specify the constraints which must be followed in implementing and carrying out the project assuming the project is approved by the Government. Without an adequate EIA report available for review, the SA will not be a position to give a definite judgement as to whether the project should be permitted and if so to specify the applicable constraints.

1.2 Responsibility for preparing an EIA report

Responsibility for preparing the EIA report, with the work meeting NEPA's professional standards, lies with the project proponent, i.e., the agency which is sponsoring or proposing to undertake the project. The EIA study may be made by the agency itself or by a Consultant employed by the agency. The role of the SA is to prescribe the TORs for a competent report, to review the report and assess its competency, to ask for additional work if any is lacking, then to determine whether the project should be approved based on a balancing of its permits for improving the national welfare versus its impacts on environmental resources, and if approved to specify the conditions to be applied to project implementation including requirements for continuing monitoring.

2. General EIA guidelines

The EIA Guidelines to be followed in preparing the EIA report for the proposed project are those, which have been issued by the SA which, are generally applicable for EIA studies. They may be included as annexes, for example, Annex I *(not included)* for guidelines applicable to all types of projects and Annex II *(not included)* for those for specific types of projects. The General Guidelines describe the format to be used in preparing the EIA report, the contents of such a report, and the degree of detail or depth required.

3. Background information

3.1 Specific background studies and reports

This section should describe and summarize the available information which relates to the environmental aspects of the proposed project including listing in the Bibliography of all pertinent earlier reports or studies on the subject. For each pertinent reference, give a summary of the significant findings and also indicate how an individual or consulting firm interested in doing the proposed EIA study may obtain or review a copy of report. This section should include the results of any preliminary/ rapid EIA which may have been made.

3.2 General background studies and reports

This section should briefly describe any known available references, such as United States Environmental Protection Agency (EPA) publications, which may be of special value for the proposed EIA study; should list such references in the Bibliography, and should indicate how a copy may be obtained or reviewed.

4. Specific EIA guidelines

4.1 Specific environmental effects

This section should list each known or suspected adverse environmental effect of significance, present a summary of known pertinent information on the extent of the hazard, and present in some detail the specifications for the additional information on the subject to be developed by the EIA study.

4.2 Corrective measures

For all adverse effects which are delineated and quantified as noted above, the EIA should propose corrective or affecting measures including discussion of alternative approaches, the recommended measures, the costs of such measures, and suggested means of financing them.

4.3 Monitoring

Because of the uncertainties involved in estimating the effects of the project on the environment, some continuing monitoring usually will be needed (including field observations/sampling/analyses) for assessing the actual effects during project operations (and perhaps even for some period after closure of the operation). The monitoring which is needed may involve physical parameters and/or socio-economic parameters. The EIA report should include consideration of such monitoring and if a monitoring program is

indicated, (i) should describe the needed monitoring program including discussion of applicable parameters, field/sampling stations, measurements/analyses, frequency of measurements/sampling, presentation and collation and interpretation of data, format for preparation of monitoring reports, suggested distribution of the reports, etc., and (ii) should present estimates of costs of the proposed monitoring and suggestions for assignment of responsibility for carrying out and financing the monitoring work.

4.4 EIA study proposal

Detailed specifications for preparation of the EIA project proposal are given in Annex. A brief summary of the salient requirements is given below,

4.4.1 Work tasks

The proposal for conducting the EIA study should consider the total EIA study as comprising a number of specific tasks, should describe each task sufficiently so that the work effort required to do it can be visualized and quantified, should estimate the types and amounts of professional skills and supporting personnel to be required. Also, summary tabulations should be prepared showing the needs for each task and for the overall job.

or in the EIA study for this particular project, it is envisioned that the following specialized skills will be needed: *(skills needed are listed here)*

4.4.2 Study schedule

By means of appropriate bar graphs and simple critical path charts, the proposed plan for carrying out the EIA study should be indicated, so that project will be completed within the period required (See Section 5).

4.4.3 Review sessions

If desirable for expediting acceptance of the EIA report, the project work plan should include provision for periodic reviews of the work at meetings to be attended by representatives of the SA as well as of the organization doing the EIA study, and by any Advisors or Advisory Committee which may be desirable.

4.4.4 Printing or reproduction of the EIA report

The project budget should include provision for reproduction or printing and delivery of the final EIA report in the amount of _____ copies.

4.4.5 Study team

A description of the proposed project team staff should be presented, including biodata for all key personnel. Of particular importance is the individual responsible for management of the project. A single individual should be designated as the EIA Study Manager, who should be assigned full-time for the duration of the project.

5. Time constraints

The EIA report for the proposed project should be completed within a period of _____ months from _____.

Proposals for conducting the EIA study should be delivered to _____ not later than _____.

6. Budget

The estimated budget allowance for the EIA study and report for this project is approximately-. For this amount is expected that an EIA report can be prepared which will meet local or donor requirements. The proposals will be evaluated on the basis of the quantity and quality of work proposed to be done within the indicated budget.

7. Outside assistance

Very few consulting firms or other groups will have all of the necessary expertise within their own regular staff, hence they will need to utilize one or more experts from outside sources. In some cases some foreign expertise may be needed, when the particular type of expertise is not available in the country.

8. Additional information

Question on any aspect of the proposed EIA study should be addressed _____.

E. INSTITUTIONAL FRAMEWORK IN LEBANON

E.1. The Context of Environmental Impact Assessment

A Lebanese Environmental Code has been drafted and submitted for governmental approval. To date, no action has been taken in this regard. Within this code, provisions are proposed to conduct environmental assessment for developmental projects. A study was conducted in an attempt to develop EA guidelines. This study appears to follow to a great extent the guidelines recommended by the World Bank. It is also not evident that the Government will adopt the guidelines set in this study. It is reasonable to expect that this study (if adopted) will be subject to a review process if and when the Environmental Code is approved by the Government. Additional work is presently underway by the Unit Planning and Programming (UPP) at the Ministry of Environment (MOE) to further refine the EIA decree under sponsorship by the World Bank Mediterranean Environmental Technical Assistance Program (METAP).

E.2. The Role of International Agencies

Lebanon does not possess adequate economic resources to finance the entire reconstruction and rehabilitation process initiated in the early 1990s after nearly two decades of civil unrest. As such, the country was forced to seek external investments as well as international grants or loans particularly for large projects dealing with infrastructure and waste management. The primary sources of funds/loans included the European Community (EC), and international funding organizations such as the World Bank. These international bodies adopted the introduction of EIAs into their programs since the early 1970's to insure sustainable development. Naturally, the major funding agencies involved in Lebanon required the Lebanese Government to conduct EIAs for projects being proposed for potential funding. As such, the introduction of EIA to Lebanon can be attributed, in great part, to international financing agencies. However, a legal or institutional framework for conducting/reviewing EIAs in Lebanon is currently lacking and remains under development (El-Fadel *et al.*, 2000).

مشروع مرسوم تقييم الأثر البيئي

(مسودة)

وزارة البيئة
٢٥ تموز ٢٠٠٠

Draft 8
July 21, 2000

مرسوم
يتعلق بتقييم الأثر البيئي للمشاريع

إن رئيس الجمهورية،

- بناء على الدستور،

- بناء على القانون رقم ٢١٦ تاريخ ٢ نيسان ١٩٩٣ (إنشاء وزارة البيئة) المعدل بالقانون رقم ٦٦٧ تاريخ ٢٩ كانون الأول ١٩٩٧، ولا سيما المادة الثانية الجديدة منه،

- بناء على القانون رقم ٦٤ تاريخ ١٨ آب ١٩٨٨ (المحافظة على البيئة ضد التلوث من النفايات الضارة والمواد الخطرة)،

- بناء على المرسوم الاشتراعي رقم ٢٢٧ تاريخ ١ تشرين الأول ١٩٤٢ (مشاريع جر مياه الشرب)، والمرسوم رقم ١٤٤٣٨ تاريخ ٢ أيار ١٩٧٠ (التنقيب عن المياه)،

- بناء على القرار رقم ٣١ / ١ تاريخ كانون الثاني ١٩٦٦ المعدل بالقرار رقم ١/١٩٦ تاريخ ٧ تموز ١٩٨٠ (إنشاء المرافئ والموانئ)،

- بناء على المرسوم رقم ٥٠٣٩ تاريخ ٩ نيسان ١٩٩٤ (التنقيب عن النفط والغاز)،
- بناء على المرسوم رقم ٥٥٠٩ تاريخ ١١ آب ١٩٩٤ (المجمعات والصهاريج ومحطات التعبئة والتوزيع والتخزين للمشتقات النفطية)،

- بناء على القرار رقم ١٦٦ LR تاريخ ٧ تشرين الثاني ١٩٣٣ (نظام الآثار القديمة)،
- بناء على القرار رقم ١١٣ تاريخ ٩ آب ١٩٣٣ (نظام المناجم) المعدل بالقرار رقم ١٣٣ تاريخ ٢٣ حزيران ١٩٣٦ والمعدل بقانون ٧ آب ١٩٦١،
- بناء على القرار رقم ٢٥٣ تاريخ ٨ تشرين الثاني١٩٣٥ (نظام المقالع)،
- بناء على المرسوم رقم ١٥٦٤٩ تاريخ ٢١ أيلول ١٩٧٠ (استخراج الرمل وسائر المواد من الأملاك العمومية البحرية ومن قعر البحر)،
- بناء على المرسوم رقم ٥٦١٦ تاريخ ٦ أيلول ١٩٩٤ (تنظيم المقالع والكسارات)،
- بناء على قرار وزير البيئة رقم ١/١٨٥ تاريخ ٧ تشرين الثاني ١٩٩٧ (مقالع الحجر التزييني وحجر العمار)،
- بناء على قرار وزير البيئة رقم ١/١٨٦ تاريخ ٧ تشرين الثاني ١٩٩٧ (مقالع الصخور لصناعة الترابة)،

- بناء على المرسوم رقم ١٥٥٩٨ تاريخ ٢١ أيلول ١٩٧٠ (تحديد الشروط لإنشاء واستثمار المؤسسات السياحية)،

- بناء على القرار رقم ١٤٤ تاريخ ١٠ حزيران ١٩٢٥ (تحديد الأملاك العمومية) والقرار رقم ٣٢٠ تاريخ ٢٦ أيار ١٩٢٦ (المحافظة على مياه الأملاك العمومية)،
- بناء على المرسوم رقم ٤٨١٠ تاريخ ٢٤ حزيران ١٩٦٦ (إشغال الأملاك العمومية البحرية)،

- بناء على القانون رقم ٥٨ تاريخ ٢٩ أيار ١٩٩١ (قانون الاستملاك)،

- بناء على القانون الصادر في ٨ تموز ١٩٣٩ (حماية المناظر والمواقع الطبيعية في لبنان)،
- بناء على المرسوم الاشتراعي رقم ٦٩ تاريخ ٩ أيلول ١٩٨٣ (قانون التنظيم المدني)،
- بناء على المرسوم الاشتراعي رقم ٧٠ تاريخ ٩ أيلول ١٩٨٣ (ضم الأراضي وفرزها)،

- بناء على المرسوم الاشتراعي رقم ٢١ل تاريخ ٢٢ تموز ١٩٣٢ (المحلات الخطرة والمضرة بالصحة والمزعجة)، والمرسوم التطبيقي رقم ١١١٩ تاريخ ٤ تشرين الثاني ١٩٣٦ والمرسوم رقم ١١٢٠ تاريخ ٤ تشرين الثاني ١٩٣٦ ، والمرسوم رقم ٤٩١٧ تاريخ ٢٤ آذار ١٩٩٤ (تعديل تصنيف المؤسسات الخطرة والمضرة بالصحة والمزعجة)،
- بناء على قرار وزير الصناعة رقم ١/٩ تاريخ ١ آب ١٩٧٩ (الأصول الواجب اتباعها في طلبات إنشاء المصانع الجديدة أو توسيع المصانع القائمة)،

- بناء على القانون المنفذ بالمرسوم رقم ٩٨٢٦ تاريخ ٢٢ حزيران ١٩٦٢ والمعدل بالمرسوم الاشتراعي رقم ١٣٩ تاريخ ١٦ أيلول ١٩٨٣(المستشفيات الخاصة)،

- بناء على المرسوم الاشتراعي رقم ١٤٨ تاريخ ١٦ أيلول ١٩٨٣ (قانون البناء)،

- بناء على المرسوم الاشتراعي رقم ١١٨ تاريخ ٣٠ حزيران ١٩٧٧ (قانون البلديات)،

- بناء على القانون المنفذ بالمرسوم رقم ١٠٤٣٤ تاريخ ١٤ حزيران ١٩٧٥ المعدل بالقانون رقم ٢٢٧ تاريخ ٣١ أيار ٢٠٠٠ (نظام مجلس شورى الدولة)،

- بناء على اقتراح وزارة البيئة،

- وبعد استشارة مجلس شورى الدولة (الرأي رقم تاريخ)،

- وبعد موافقة مجلس الوزراء بتاريخ ،

يرسم ما يأتي :

الفصل الأول مراحل تقييم الأثر البيئي للمشاريع

المادة الأولى : الهدف

إن الهدف من هذا المرسوم هو تحديد الأصول الإلزامية التي تخضع إليها كافة المشاريع العامة والخاصة التي قد ينتج عنها اثر هام على البيئة الفيزيائية والكيميائية والبيولوجية والاجتماعية والاقتصادية .

المادة الثانية :

يفهم بالمفردات والتعابير الآتية أينما وردت في هذا المرسوم ما هو مبين تجاه كل منها:

تقييم الأثر البيئي: تحديد وتقدير وتقييم آثار مشروع مقترح على البيئة وتعيين التدابير اللازمة للتخفيف من الآثار السلبية وزيادة الآثار الإيجابية على البيئة والموارد الطبيعية وذلك قبل إعطاء القرار بالموافقة على المشروع أو رفضه.

الفحص البيئي المبدئي: دراسة أولية تهدف إلى تحديد الآثار البيئية المحتملة للمشروع المقترح والتحقق من ضرورة إجراء دراسة " تقييم أثر بيئي " للمشروع.

خطة الإدارة البيئية : مجموعة التدابير التخفيفية ووسائل الرصد والمراقبة والإجراءات المؤسساتية المتخذة خلال إنشاء أوتشغيل أوتفكيك المشروع والتي من شانها إلغاء الآثار البيئية السلبية أو تخفيفها إلى مستويات مقبولة. تعتبر " خطة الإدارة البيئية " جزءاً من تقرير " تقييم الأثر البيئي " وتقرير " الفحص البيئي المبدئي ".

المشروع :
- تنفيذ أشغال بناء أو سواها من الإنشاءات والذي قد يكون له آثار هامة على البيئة.
- أية مداخلة في المحيط الطبيعي بما فيها تلك التي تتضمن أعمال استخراج الموارد الطبيعية، والتي قد يكون لها آثار هامة على البيئة نتيجة إنشائها أو تشغيلها أوتفكيكها.
- تصاميم وأنظمة تنظيم المدن والقرى وتصاميم التصنيف ونظام الارتفاقات ومشاريع ضم الأراضي وفرزها .

صاحب المشروع :
- الشخص الطبيعي أو المعنوي من القطاع الخاص الذي يطلب الترخيص لإقامة مشروعه.
- الإدارة العامة التي تبادر بمشروع معين.

الترخيص : القرار الأساسي الذي تعطيه المؤسسة ذات الصلاحية بما فيه الإيصال بالتصريح والذي يجيز لصاحب مشروع خاص مباشرة العمل في مشروعه المقترح، بصرف النظر عن استقلالية هذا القرار أو ارتباطه بتراخيص أو موافقات أخرى.

المؤسسة ذات الصلاحية: الكيان الإداري أو الحكومي الصالح لإعطاء الترخيص لإقامة مشروع مقترح.

يوم عمل: إن عدد أيام العمل في الأسبوع المتعارف عليه هو ستة تُخرّج منها أيام العطلة الرسمية.

الملحق رقم ١: لائحة بالمشاريع التي تستلزم دراسة " **تقييم أثر بيئي** " ترتكز على إعداد تقرير " **تقييم الأثر البيئي** " للمشروع.

الملحق رقم ٢: لائحة بالمشاريع التي تستلزم " **فحصا بيئيا مبدئيا** " يرتكز على إعداد تقرير " **فحص بيئي مبدئي** " للمشروع، باستثناء المشاريع التي تقع ضمن منطقة محددة في **الملحق رقم ٣** أو قد يكون لها اثر هام على هكذا منطقة بحيث تخضع هذه المشاريع لدراسة " **تقييم الأثر البيئي** " التي ترتكز على إعداد تقرير " **تقييم الأثر البيئي** " للمشروع .

الملحق رقم ٣ : لائحة بالمناطق اللبنانية التي تعتبر حساسة بيئيا حيال أي مشروع. إن المشاريع المذكورة في **الملحق رقم ١ أو رقم ٢** التي تقع في هكذا منطقة أو قد يكون لها اثر هام على هكذا منطقة تخضع لدراسة " **تقييم الأثر البيئي** " التي ترتكز على إعداد تقرير " **تقييم الأثر البيئي** " للمشروع . أما المشاريع غير المذكورة في **الملحق رقم ١** أو **رقم ٢** والتي تقع في هكذا منطقة أو قد يكون لها اثر هام على هكذا منطقة ، فتخضع لـ " **فحص بيئي مبدئي** " يرتكز على إعداد تقرير " **الفحص البيئي المبدئي** " للمشروع.

الملحق رقم ٤ : نموذج التصنيف ل " **تقييم الأثر البيئي** " الذي يتعين تعبئته من قبل صاحب المشروع وتقديمه للمؤسسة ذات الصلاحية.

الملحق رقم ٥ : لائحة بالمعنيين المحتملين.

الملحق رقم ٦ : لائحة بالمعلومات المطلوبة في تقرير " **الفحص البيئي المبدئي** " .

الملحق رقم ٧ : لائحة بالمعلومات المطلوبة في تقرير برنامج " **تقييم الأثر البيئي** " .

الملحق رقم ٨ : لائحة بالمعلومات المطلوبة في تقرير " **تقييم الأثر البيئي** " .

المادة الثالثة :

(١) يحظر تجزئة المشروع وعرضه على مراحل بشكل يحول دون التمكن من تصنيفه بدقة، وفي هذه الحال تعتبر دراسة " **تقييم الأثر البيئي** " المقدمة لمشروع مجزأ باطلة.

(٢) يخضع لأحكام هذا المرسوم أي تعديل جوهري وأي توسيع لمشروع قائم.

المادة الرابعة : أصول طلب الموافقة على تقييم الأثر البيئي

يتقدم صاحب المشروع من المؤسسة ذات الصلاحية بطلب إفادته عن تصنيف مشروعه وفقا للنموذج المعتمد المبين في **الملحق رقم ٤**، مع المستندات الثبوتية المطلوبة من

وزارة البيئة. وتقوم المؤسسة ذات الصلاحية، بعد تسجيل الطلب لديها، بإحالتـــه إلـــى وزارة البيئة.

المادة الخامسة: تصنيف المشاريع

(١) على وزارة البيئة ، عند تسلمها طلب التصنيف لمشروع مقترح وفقـــا للأنمـــوذج المعتمد مع مستنداته، أن تتحقق من ورود المشروع في الملحق رقم ١ أو رقم ٢، أو وقوعه في منطقة مبينة في الملحق رقم ٣ أو إمكانية أن يكون له أثر هام علـــى هكذا منطقة.

(٢) على وزارة البيئة أن تعلم المؤسسة ذات الصلاحية وصـــاحب المشـــروع بقـــرار التصنيف خلال فترة ستة أيام عمل من استلامها طلب التصنيف.

أ - إذا تبين أن المشروع المقترح وارد في الملحق رقم ١، يخضع المشـــروع إلى دراسة " تقييم الأثر البيئي " التي ترتكز على إعداد تقريـــر " تقييـــم الأثر البيئي " للمشروع وفقا للمعلومات المبنية في الملحق رقم ٨.

ب - إذا تبين أن المشروع المقترح وارد فـــي الملحـــق رقـــم ٢ ، يخضـــع المشروع إلى " فحص بيئي مبدئي " يرتكز على إعداد تقرير " الفحـــص البيئي المبدئي " للمشروع وفقا للمعلومات المبينة في الملحق رقم ٦.

ج – إذا كان المشروع المقترح المصنف ضمن البند (ب) أعـــلاه يقـــع فـــي منطقة مبينة في الملحق رقم ٣ أو قد يكون له أثر هام على هكذا منطقـــة، يخضع المشروع إلى دراسة " تقييم الأثر البيئي" التي ترتكز على إعـــداد تقرير " تقييم الأثر البيئي " للمشروع.

د - إذا تبين أن المشروع غير وارد في الملحق رقم ١ أو رقم ٢ وهـــو يقـــع في منطقة مبينة في الملحق رقم ٣ أو قد يكون له أثر هـــام علـــى هكـــذا منطقة ، يخضع هذا المشروع إلى " فحص بيئي مبدئي " يرتكـــز علـــى إعداد تقرير " الفحص البيئي المبدئي " للمشروع.

ه - في حال عدم إبلاغ صاحب المشروع قـــرار الـــوزارة ضمـــن المهلـــة المحددة، يعتبر أن إجراء " تقييم الأثـــر البيئـــي " ليـــس مطلوبـــا لـــهذا المشروع.

(٣) يحق لوزير البيئة ، وذلك خلال فترة ستة أيام عمل مـــن تســـلم الـــوزارة طلـــب التصنيف، أن يطلب تقرير " فحص بيئي مبدئي " أو تقرير " تقييم أثـــر بيئـــي " لمشروع ما بغض النظر عن تصنيف هذا المشروع حســـب الفقرتيـــن (١) و (٢) من هذه المادة.

المادة السادسة : الفحص البيئي المبدئي

إذا تبين أن المشروع المقترح يستلزم " فحصا بيئيا مبدئيا " ، على صاحبه أن يعد ويقدم لوزارة البيئة تقرير " الفحص البيئي المبدئي " لمشروعه . وتقوم وزارة البيئة بمراجعة وتقييم هذا التقرير خلال فترة خمسين يوم عمل من تسلمها التقرير وتقرر:

(١) إما الطلب من صاحب المشروع إعداد تقرير " تقييم أثر بيئي" إذا أظهر تقييمها لتقرير " الفحص البيئي المبدئي " انه من المحتمل أن يكون للمشروع المقترح أثر سلبي هام على البيئة وذلك نتيجة إنشاء المشروع أو تشغيله أو تفكيكه واذا كان المشروع مشروعاً خاصاً، تبلغ نسخة عن هذا القرار الى المؤسسة ذات الصلاحية؛

(٢) إما تبليغ صاحب المشروع بان مشروعه ليس بحاجة إلى دراسة " تقييم اثر بيئي" إذا أظهر تقييمها لتقرير " الفحص البيئي المبدئي" انه من غير المحتمل أن يكون للمشروع أثر سلبي هام على البيئة شرط أن يلتزم صاحب المشروع بآلية " خطة الإدارة البيئية " حسب المادة الحادية عشرة واذا كان المشروع مشروعاً خاصاً، يبلغ صاحبه هذا القرار من خلال المؤسسة ذات الصلاحية.

(٣) في حال عدم إبلاغ صاحب المشروع قرار الوزارة ضمن المهلة المحددة، يعتبر أن المشروع ليس بحاجة لدراسة " تقييم الأثر البيئي ".

المادة السابعة : تحديد نطاق تقييم الأثر البيئي

(١) إذا تبين أن المشروع المقترح يستلزم دراسة " تقييم أثر بيئي" ، على صاحب المشروع أن يعد، بالتنسيق مع وزارة البيئة، برنامج " تقييم الأثر البيئي" وفقا للمعلومات المبينة في الملحق رقم ٧ .

(٢) عند تبليغ صاحب المشروع بأن مشروعه يستلزم دراسة " تقييم أثر بيئي"، تطلب منه وزارة البيئة إبلاغ المعنيين بالمشروع والذين يتم تحديدهم من ضمن اللائحة المبينة في الملحق رقم ٥. ويعتبر خاتم المؤسسة المعنية وتوقيع المفوض بالتوقيع عنها وتاريخ التسجيل على مستند خاص معد لهذه الغاية مثبتا لقيام صاحب المشروع بإبلاغ المعنيين المشار إليهم.

(٣) على البلدية (أو القائمقام في حال عدم وجود بلدية) التي يقع المشروع في نطاقها عند إبلاغها عن المشروع أن تبادر فورا إلى الإعلان عنه بهدف إعلام العامة ونشر الإعلان على لوحة الإعلانات العمومية وفي موقع العقار حيث المشروع لفترة ثمانية عشر يوم عمل، على أن يتضمن الإعلان أن المشروع المقترح يستلزم دراسة " تقييم أثر بيئي" ، وانه يعود للعامة إبداء ملاحظاتها. تبلغ البلدية وزارة البيئة تاريخ البدء بنشر الإعلان.

(٤) تتيح وزارة البيئة للمعنيين والمهتمين إبداء ملاحظاتهم الخطية على المشروع في وزارة البيئة خلال فترة اثنتي عشر يوم عمل من تاريخ نشر الإعلان محليا أو إبلاغ المؤسسة المعنية أو المهتمة، وتحيل الوزارة كافة الملاحظات لصاحب المشروع خلال فترة ستة أيام عمل من تسلمها الملاحظات.

(٥) على صاحب المشروع أن يقدم تقريرا ببرنامج " **تقييم الأثر البيئي**" ويرفقه بنسخ عن الملاحظات المرسلة إليه والتعليقات الواردة وأصل محاضر اللقاءات العامة للمناقشة أو أصل محاضر الاجتماعات الثنائية مع المعنيين.

(٦) على وزارة البيئة وخلال مهلة خمسة وعشرين يوم عمل من استلامها تقرير برنامج " **تقييم الأثر البيئي**" أن تصدر قرارها وتبلغه لصاحب المشروع. هذا القرار يمكن أن يكون قرارا بالموافقة على التقرير أو قرارا بالموافقة مع تعديلات محددة، أو قرارا بطلب معلومات إضافية. وعلى الوزارة أن تصدر قرارها حيال المعلومات الإضافية التي يقدمها صاحب المشروع خلال فترة خمسة وعشرين يوم عمل من استلامها المعلومات.

(٧) في حال عدم إبلاغ صاحب المشروع قرار الوزارة ضمن المهلة المحددة ، يعتبر تقرير برنامج " **تقييم الأثر البيئي** " للمشروع موافقا عليه من قبل الوزارة.

(٨) على وزارة البيئة أن تعد اجتماعا لمناقشة ملاحظاتها وقرارها، في حال طلب صاحب المشروع ذلك، ويعود لها دعوة أي شخص أو مؤسسة معنية تراها مناسبة.

(٩) إن تقرير برنامج " **تقييم الأثر البيئي** " الذي توافق عليه وزارة البيئة معد لاطلاع العامة والمؤسسات المعنية أو المهتمة لدى الوزارة.

المادة الثامنة: **تطبيق برنامج تقييم الأثر البيئي المرتكز على إعداد تقرير تقييم الأثر البيئي**

(١) إن صاحب المشروع هو المسؤول عن تطبيق برنامج " **تقييم الأثر البيئي** " الذي يتضمن إعداد تقرير "**تقييم الأثر البيئي** " وعرضه على وزارة البيئة وفقا للمعلومات المبنية في **الملحق رقم ٨.**

(٢) إن صاحب المشروع هو المسؤول عن التحقق عن أي اثر بيئي لم يذكر في برنامج " **تقييم الأثر البيئي** " ولكن تبين وجوده خلال أي مرحلة من مراحل الدراسة والتنفيذ.

المادة التاسعة: مراجعة تقرير تقييم الأثر البيئي

(١) تقوم وزارة البيئة بمراجعة تقرير " **تقييم الأثر البيئي** " وتطابقه مع برنامج " تقييم الأثر البيئي " الموافق عليه خلال فترة خمسة وسبعين يوم عمل من استلامها التقرير. وإذا لم يكن التقرير متطابقا مع البرنامج الموافق عليه، أو إذا لم يقم صاحب المشروع بالدراسات الإضافية المشار إليها في الفقرة (٢) من المادة الثامنة ، يطلب من صاحب المشروع تصحيح المعلومات أو استكمال النواقص وإعادة تقديم التقرير. على الوزارة مراجعة المعلومات الإضافية أو المصححة خلال فترة خمسة وسبعين يوم عمل من استلامها المعلومات.

(٢) في حال عدم إبلاغ صاحب المشروع قرار الوزارة ضمن المهلة المحددة، يعتبر تقرير " **تقييم الأثر البيئي** " للمشروع موافقا عليه من قبل الوزارة.

المادة العاشرة: المقررات المتعلقة بتقرير تقييم الأثر البيئي

(١) بعد مراجعة النسخة النهائية من تقرير " **تقييم الأثر البيئي** "، تصدر وزارة البيئة كشفا بمثابة قرار حول هذا التقرير. ويكون هذا القرار قرارا بالموافقة ، أو قرارا بالموافقة المشروطة أو قرارا معللا بالرفض.

(٢) يتم تبليغ نتيجة القرار لصاحب المشروع بالاضافة الى المؤسسة ذات الصلاحية اذا كان المشروع مشروعاً خاصاً، ويمكن للعامة ولكافة المهتمين الاطلاع على القرار لدى وزارة البيئة. كما يبلغ هذا القرار الى البلدية المختصة لنشره على لوحة الاعلانات خلال فترة اثنتي عشر يوم عمل.

(٣) يحظر على المؤسسة ذات الصلاحية اصدار ترخيص لمشروع خاص قبل الموافقة على تقرير " **تقييم الأثر البيئي** " لهذا المشروع من قبل وزارة البيئة.

(٤) يحظر على أي إدارة عامة مباشرة مشروعها المقترح قبل الموافقة على تقرير " **تقييم الأثر البيئي** " لهذا المشروع من قبل وزارة البيئة .

المادة الحادية عشرة: التدابير التخفيفية وإدارة المشروع والمراقبة اللاحقة لبدء تنفيذ المشروع

(١) يلتزم صاحب المشروع بآلية " **خطة الإدارة البيئية** " خلال أعمال الإنشاء والتشغيل والتفكيك.

(٢) تتولى وزارة البيئة مراقبة تطبيق آلية " **خطة الإدارة البيئية** " للمشروع خلال أعمال الإنشاء والتشغيل والتفكيك.

(٣) إذا تبين أن الأعمال المذكورة غير مطابقة لما التزم به صاحب المشروع في " **خطة الإدارة البيئية** " يجوز لوزارة البيئة التدخل لطلب إبطال الترخيص المعطى له أو لإصدار توصية بوقف تنفيذ المشروع الذي تنفذه إدارة أو مؤسسة عامة أو ينفذ لحسابها.

المادة الثانية عشرة: نشر المعلومات

تحتفظ وزارة البيئة بنسخ عن التقرير النهائي لـ " **تقييم الأثر البيئي** " معدة لاطلاع العامة والمؤسسات المهتمة.

المادة الثالثة عشرة: مدة صلاحية القرار

يسقط قرار الموافقة النهائي حكما بمرور سنة على صدوره إذا لم يصدر الترخيص النهائي ضمن هذه المهلة، أو إذا لم يتم المباشرة جديا بالانشاء. في هذه الحال ، على صاحب المشروع إبلاغ وزارة البيئة برغبته بمتابعة المشروع فتقوم الوزارة بالتحقق عن نشوء عناصر جديدة تدعو لإجراء دراسة " **تقييم الأثر البيئي** " أو " **فحصا بيئيا مبدئيا** " مجددا أم لا.

المادة الرابعة عشرة: الاعتراضات والمراجعات

(١) لصاحب المشروع والمعنيين وأصحاب الحقوق والعموم الحق بتقديم اعتراضات خطية على مقررات وزارة البيئة المحددة في المادة العاشرة. تقبل هذه الاعتراضات لدى وزارة البيئة خلال فترة اثنتي عشر يوم عمل من نشر هذه القرارات وعلى الوزارة البت بهذه الاعتراضات خلال فترة اثنتي عشر يوم عمل من تسلمها الاعتراضات. لا تقبل الاعتراضات الواردة بعد المهلة المحددة في هذه الفقرة. وفي حال عدم إبلاغ صاحب المشروع قرار الوزارة حيال اعتراضاته ضمن المهلة المحددة، تعتبر هذه الاعتراضات غير مقبولة من قبل الوزارة.

(٢) إذا كانت المراجعة المقامة أمام القضاء الإداري تتناول ترخيصا لمشروع كان يجب أن يخضع لدراسة " **تقييم أثر بيئي** " على انتفاء هذه الدراسة، يتم إعلان وقف تنفيذ القرار المطعون فيه بعد التأكد من عدم وجود الدراسة المذكورة وفقا للأصول المستعجلة عملا بالمادة (٧٤) من نظام مجلس شورى الدولة. يعود للمرجع القضائي المختص البت في مسألة عدم جدية أو عدم كفاية دراسة " **تقييم الأثر البيئي** " .

(٣) إذا اعترضت الإدارات والمؤسسات العامة على مقررات وزارة البيئة المبنية في المادة العاشرة والمادة الحادية عشرة ، ترفع الاعتراضات إلى مجلس الوزراء للبت بها.

المادة الخامسة عشرة: المخالفات والغرامات

(١) يعود لوزارة البيئة طلب إبطال ترخيص صادر خلافاً لآلية وشروط الموافقة على دراسة " **تقييم الأثر البيئي** " أو إصدار توصية بوقف تنفيذ المشروع الذي تنفذه إدارة أو مؤسسة عامة أو ينفذ لحسابها. على القوى العامة أن تقدم المؤازرة في تنفيذ قرار الوزارة مع مراعاة دواعي العجلة في تنفيذ هذا القرار.

(٢) يكون باطلاً قرار وزارة البيئة الصادر استناداً إلى معلومات خاطئة قدمها صاحب المشروع وتطبق عليه أحكام الفقرة (٣) أو (٤) من هذه المادة.

(٣) يمكن للمحاكم أن تحكم على كل صاحب مشروع خاص بغرامة قدرها ١٥ % من قيمة المشروع كحد أقصى في حال امتناعه عن إجراء " **فحص بيئي مبدئي**" لمشروعه الذي يستلزم ذلك وفقاً لهذا المرسوم . كما يمكن أن تحكم عليه بإجراء " **الفحص البيئي المبدئي** " لمشروعه في حال لم يباشر بتنفيذ المشروع أو الالتزام بجميع الشروط المتعلقة بـ " **خطة الإدارة البيئية** " التي تحددها وزارة البيئة إذا أنهى التنفيذ.

(٤) يمكن للمحاكم أن تحكم على كل صاحب مشروع خاص بغرامة قدرها ١٥ % من قيمة المشروع كحد أقصى في حال امتناعه عن إجراء دراسة " **تقييم أثر بيئي** " لمشروعه الذي يستلزم ذلك وفقاً لهذا المرسوم . كما يمكن أن تحكم عليه بإجراء دراسة " **تقييم الأثر البيئي** " لمشروعه في حال لم يباشر بتنفيذ المشروع أو الالتزام بجميع الشروط المتعلقة بـ " **خطة الإدارة البيئية** " التي تحددها وزارة البيئة إذا أنهى التنفيذ.

المادة السادسة عشرة: كلفة مراجعة دراسة تقييم الأثر البيئي والفحص البيئي المبدئي

(١) يسدد صاحب المشروع رسماً إدارياً وقدره /٥٠,٠٠٠ ل.ل./ خمسون ألف ليرة لبنانية عن المشاريع التي تستلزم تقرير " **فحص بيئي مبدئي** " و /١٠٠,٠٠٠ ل.ل./ مائة ألف ليرة لبنانية عن المشاريع التي تستلزم تقرير " **تقييم أثر بيئي** " وذلك فور تبلّغ صاحب المشروع قرار التصنيف لمشروعه.

(٢) يسدد صاحب المشروع الخاص كلفة مراجعة الدراسة بموجب كفالة مصرفية تودع لدى وزارة البيئة بقيمة مبدئية تبلغ نسبة ٠,٠٥ % من قيمة المشروع وفقاً للقيمة المقدمة من صاحب المشروع في **الملحق رقم ٤** ، وذلك فور بدئه بإعداد برنامج " **تقييم الأثر البيئي** " لمشروعه . تغطي هذه الكفالة كلفة مراجعة دراسة " **تقييم الأثر البيئي** " إذا احتاجت الوزارة لخبير متخصص للقيام بذلك .

(٣) في ما يتعلق بالمشاريع المقدمة من الإدارات والمؤسسات العامة ، فان هذه الإدارات والمؤسسات تلتزم بأن تلحظ ضمن موازنة المشروع تغطية كلفة مراجعة الدراسة وتسديدها.

الفصل الثاني تعديل النصوص المعمول بها

المادة السابعة عشرة :

تلغى جميع الأحكام المخالفة لهذا المرسوم أو التي لا تتفق مع أحكامه ، ويتم لا سيما تعديل النصوص المشار إليها ضمن حيثيات هذا المرسوم على الشكل التالي:

المياه:
يضاف إلى المادة السادسة من المرسوم رقم ١٩٤٢/٢٢٧ النص التالي:
" تخضع مشاريع جر مياه الشرب لأحكام المرسوم المتعلق بتقييم الأثر البيئي. "

يضاف إلى المادة الثالثة من المرسوم رقم ١٩٧٠/١٤٤٣٨ النص التالي:
" يخضع التنقيب عن المياه لأحكام المرسوم المتعلق بتقييم الأثر البيئي. "

المرافئ والموانئ:
يضاف إلى المرسوم رقم ١٩٦٦/١/٣١ النص التالي:
" يخضع إنشاء وتوسيع المرافئ والموانئ لأحكام المرسوم المتعلق بتقييم الأثر البيئي."

التنقيب عن النفط والغاز والمجمعات للمشتقات النفطية:
يضاف إلى البند ١ من المادة الأولى من المرسوم رقم ١٩٩٤/٥٠٣٩ النص التالي:
"يخضع التعاقد مع شركات البحث والتنقيب عن النفط والغاز واستخراجها واستثمارها في المياه الإقليمية اللبنانية لأحكام المرسوم المتعلق بتقييم الأثر البيئي. "

يضاف إلى المرسوم رقم ١٩٩٤/٥٥٠٩، في مادة أخيرة، النص التالي:
" تخضع إقامة المجمعات العامة للمشتقات النفطية السائلة ومحطات توزيع وتخزين وتعبئة المحروقات المسيلة لأحكام المرسوم المتعلق بتقييم الأثر البيئي. "

الآثار القديمة:
يضاف إلى المادة ٥٦ من القرار رقم ١٩٣٣/١٦٦ النص التالي:
" يخضع القيام بحفريات أثرية في الأملاك الخاصة والعامة لأحكام المرسوم المتعلق بتقييم الأثر البيئي ."

المناجم والمقالع والمرامل والكسارات:
يضاف إلى المادة ١٥ من القرار رقم ١٩٣٣/ل/١١٣ النص التالي:
" يخضع الترخيص بالتنقيب لأحكام المرسوم المتعلق بتقييم الأثر البيئي. "

يضاف إلى المادة ٤ من القرار رقم ١٩٣٥/٢٥٣ النص التالي:
" يخضع فتح واستثمار المقالع في الأملاك الخاصة لأحكام المرسوم المتعلق بتقييم الأثر البيئي. "

يضاف إلى المادة ٨ من القرار رقم ١٩٣٥/٢٥٣ النص التالي:
" يخضع فتح واستثمار المقالع في أملاك الدولة لأحكام المرسوم المتعلق بتقييم الأثر البيئي. "

يضاف إلى المادة الرابعة من المرسوم رقم ١٩٧٠/١٥٦٤٩ النص التالي:
" يخضع استخراج الرمل وسائر المواد لأحكام المرسوم المتعلق بتقييم الأثر البيئي."

يضاف إلى المادة ١١ من المرسوم رقم ١٩٩٤/٥٦١٦ النص التالي:
" يخضع استثمار المقالع لأحكام المرسوم المتعلق بتقييم الأثر البيئي. "

يضاف الى المادة الاولى من القرار رقم ١٩٩٧/١٨٥ النص التالي:
" يخضع الترخيص لمقالع الحجر التزييني وحجر العمار لأحكام المرسوم المتعلق بتقييم الأثر البيئي."

يضاف الى المادة الاولى من القرار رقم ١٩٩٧/١٨٦ النص التالي:
" يخضع الترخيص لمقالع الصخور لصناعة الترابة لأحكام المرسوم المتعلق بتقييم الاثر البيئي."

المؤسسات السياحية:
يضاف إلى المادة الثانية (في بدايتها) من المرسوم رقم ١٩٧٠/١٥٥٩٨ النص التالي:
" يخضع بناء أو فتح أو استثمار مؤسسة سياحية لأحكام المرسوم المتعلق بتقييم الأثر البيئي. "

الأملاك العمومية والاستملاك:
يضاف إلى المادة ١٤ من القرار رقم ١٩٢٥/١٤٤ النص التالي:
" يخضع الامتياز أو الإجازة بإشغال الأملاك العمومية لأحكام المرسوم المتعلق بتقييم الأثر البيئي ."

يضاف إلى المادة الأولى من المرسوم رقم ١٩٦٦/٤٨١٠ النص التالي:
" يكون عملاً استثنائياً ويخضع لأحكام المرسوم المتعلق بتقييم الأثر البيئي ."

يضاف إلى المادة الثانية من القانون رقم ١٩٩١/٥٨ النص التالي (بعد عبارة صاحب الامتياز):
" مع مراعاة أحكام المرسوم المتعلق بتقييم الأثر البيئي. "

المناظر والمواقع الطبيعية:
يضاف إلى المادة السادسة من القانون الصادر في ٨ تموز ١٩٣٩ النص التالي:
" يخضع تصنيف المواقع الطبيعية لأحكام المرسوم المتعلق بتقييم الأثر البيئي ."

التنظيم المدني:
يضاف إلى الباب الثاني من المرسوم الاشتراعي رقم ١٩٨٣/٦٩، في مادة جديدة، النص التالي:
" تخضع تصاميم وأنظمة تنظيم المدن والقرى وتصاميم التصنيف ونظام الارتفاقات لأحكام المرسوم المتعلق بتقييم الأثر البيئي ."

يضاف إلى المادة الخامسة من المرسوم الاشتراعي رقم ١٩٨٣/٧٠ النص التالي:
" تخضع مشاريع ضم الأراضي وفرزها في الأماكن الآهلة لأحكام المرسوم المتعلق بتقييم الأثر البيئي ."

المؤسسات المصنفة:
يضاف إلى الشروط المحددة في المادة السابعة من المرسوم الاشتراعي رقم ١٩٣٢/ل/٢١ النص التالي:
" تخضع المؤسسات المصنفة لأحكام المرسوم المتعلق بتقييم الأثر البيئي ."

يضاف إلى الشروط المحددة في المادة ١٣ من المرسوم الاشتراعي رقم ١٩٣٢/ل/٢١ النص التالي:
" تخضع المؤسسات المصنفة لأحكام المرسوم المتعلق بتقييم الأثر البيئي ."

المصانع:
تعدل المادة الثانية من القرار رقم ١٩٧٩/١/٩ بحيث تصبح كما يلي:
" يخضع إنشاء المصانع الجديدة وتوسيع المصانع القائمة لأحكام المرسوم المتعلق بتقييم الأثر البيئي وللقواعد والأصول التالية:"

المستشفيات الخاصة:
يضاف إلى المادة الثانية من القانون المنفذ بالمرسوم رقم ١٩٦٢/٩٨٢٦ النص التالي:
" يخضع إنشاء وتوسيع المستشفيات الخاصة لأحكام المرسوم المتعلق بتقييم الأثر البيئي ."

البناء:
يضاف إلى المادة ١٦ من القانون رقم ١٩٨٣/١٤٨ النص التالي:
" تخضع المجموعات الكبرى لأحكام المرسوم المتعلق بتقييم الأثر البيئي ."

الفصل الثالث أحكام عامة مختلفة

المادة الثامنة عشرة: تعديل المرسوم والملاحق

(١) يمكن تعديل هذا المرسوم وفقا للاحتياجات الفنية والقانونية وعملا بتطوير الضرورات البيئية بموجب مرسوم يتخذ في مجلس الوزراء بناء على اقتراح وزير البيئة والوزير المختص بالتعديل المطلوب.

(٢) يمكن تعديل الملاحق بموجب مرسوم صادر عن مجلس الوزراء بناء على اقتراح وزير البيئة.

المادة التاسعة عشرة :

تشكل أحكام هذا المرسوم الشروط الأدنى في موضوع " تقييم الأثر البيئي " ، وتحتفظ الإدارات والمؤسسات العامة بالحق في فرض شروط أكثر صرامة . وفي هذه الحال ، وبعد موافقة وزارة البيئة ، تعتبر الشروط الأكثر صرامة هي النافذة .

المادة العشرون:

يعمل بهذا المرسوم فور نشره في الجريدة الرسمية.

ملحق رقم ١:
المشاريع التي تستلزم تقرير تقييم أثر بيئي

ملحق رقم ١: المشاريع التي تستلزم تقرير تقييم أثر بيئي

١. الري والصرف:
- إنشاء السدود والبحيرات الاصطناعية والمستنقعات
- مشاريع الري المتكاملة

٢. مياه الشفة:
- إنشاء السدود والخزانات والبرك والبحيرات الاصطناعية
- المشاريع المتكاملة المتعلقة بتزويد مياه الشفة

٣. المياه المبتذلة:
- إنشاء محطات تكرير المياه المبتذلة
- إنشاء قنوات التصريف البحرية
- المشاريع المتكاملة المتعلقة بالمياه المبتذلة

٤. النفايات الصلبة:
- إنشاء مراكز إدارة ومعالجة النفايات الصلبة على أنواعها والمطامر الصحية

٥. الزراعة والغابات:
- تجهيز الأراضي للزراعة وما يشمل ذلك من تسطيح ، وتفريغ واستصلاح واستعمال مواد كيميائية في النشاط الزراعي
- مشاريع إزالة الأحراج

٦. إنشاء الطرق والجسور والسكك الحديدية

٧. إنشاء المطارات والمرافئ

٨. توليد وتزويد الطاقة الكهربائية:
- إنشاء معامل توليد الطاقة الكهربائية
- إنشاء محطات تحويل الطاقة الكهربائية

٩. النفط:
- إنشاء الأنابيب على أو بعيدا من الشاطئ
- حفر واستخراج الغازات أو النفط
- إنشاء مصافي النفط
- إنشاء المرابض
- إنشاء الخزانات

١٠. المناجم والمقالع والمرامل والكسارات

١١. المشاريع السياحية والترفيهية:

- إنشاء مراكز التزلج

١٢. استصلاح الأراضي

١٣. إشغال الأملاك العمومية النهرية والبحرية

١٤. تصاميم وأنظمة تنظيم المدن والقرى وتصاميم التصنيف ونظام الارتفاقات

١٥. المصانع:
- إنشاء المناطق الصناعية
- الصناعات المذكورة في الجدول أدناه:

الرقم ISIC	الصنف/ المادة	الفئة
د	صناعة	
١٥	صناعة المواد الغذائية	
١٥١١	لحوم طازجة ومحفوظة. تشمل المسالخ – والمسالخ	٢
١٥١٢	لحوم الطيور الداجنة – طازجة ومحفوظة والمسالخ	٢
١٥٧١	علف مصنع للحيوانات الداجنة تصنيع	١
١٥٨٣	سكر صناعة باردة صناعة حامية	٣ ٢
١٩	صناعة الجلود	
١٩١٠	كشط ودبغ وشغل وكي (وغيرها من أعمال التصنيع) الجلود	١
٢١	صناعة الورق	
٢١١١	لب الخشب	١
٢٣	النفط والفحم	
٢٣٢٠	منتجات النفط المكرر مصافي	١
٢٤	الصناعات الكيماوية	
٢٤١١	الغازات الصناعية الطاقة => ١٠ ط. هواء /ي مصانع مختلفة للغازات	١ ١
٢٤١٤	مواد كيماوية عضوية مختلفة	٢
٢٤١٥	سماد ومركبات النيتروجين	١
٢٤١٦	مواد بلاستيكية بشكلها الأولي	٢
٢٤٢٠	المبيدات وغيرها من المنتجات الكيماوية الزراعية، أنظر المراسيم العائدة للزراعة	١
٢٤٣٠	دهانات وفرنيش وغيرها من الطلاءات، حبر طباعة وعلك – انتاج	٢
٢٤٦١	متفجرات [أنظر قانون وزارة الداخلية للمفرقعات والمواد المتفجرة]	١
٢٦	مواد بناء	
٢٦٥١	ترابة صناعة	١
٢٦٥٢	كلس (جير) صناعة	١
٢٦٥٣	جبس صناعة	١
٢٦٨٠	منتجات منجمية اخرى غير ممعدنة – غ م س مع اسبست	٢
٢٧	صناعة المعادن الأولية	
٢٧١٠	تصنيع الحديد والفولاذ والخليط المعدني	٢
٢٧٢١	أنابيب وأكسسوار من حديد الزهر (فونط) م.ع. > ٥٠٠ م٢ م.ع. بين ٥٠٠ و ١٠٠٠ م٢	٤ ٣

	م.ع. =>١٠٠٠ م٢	٢
٢٧٢٢	أنابيب وأكسسوار فولاذية م.ع. < ٥٠٠ م٢ م.ع. بين ٥٠٠ و ١٠٠٠ م٢ م.ع. =>١٠٠٠ متر٢	٤ ٣ ٢
٢٧٣٣	منتجات حديدية وفولاذية ستانلس غير سبيكية م.ع. < ٥٠٠ م٢ م.ع. بين ٥٠٠ و ١٠٠٠ م٢ م.ع. =>١٠٠٠ م٢	٤ ٣ ٢
٢٧٣٥	سبائك حديدية وسبائك حديدية فولاذية م.ع. < ٥٠٠ م٢ م.ع. بين ٥٠٠ و ١٠٠٠ م٢ م.ع. =>١٠٠٠ م٢	٤ ٣ ٢
٢٧٤١	معادن ثمينة ط.أ. <١٠٠٠ ط/ع ط.أ. =>١٠٠٠ ط/ع	٤ ٣
٢٧٤٢	ألمنيوم سحب وصب	٢
٢٧٤٣	منتجات من الرصاص من الزنك والقصدير	٢ ٣
٢٧٤٤	منتجات نحاسية ط.أ. <١٠٠٠ ط/ع ط.أ. =>١٠٠٠ ط/ع	٣ ٢
٢٧٤٥	منتجات معدنية أخرى غير حديدية ط.أ. <١٠٠٠ ط/ع ط.أ. =>١٠٠٠ ط/ع	٣ ٢
٢٧٥١	خدمات صب الحديد	٣
٢٧٥٣	خدمات صب المعادتن الخفيفة	٣
٢٧٥٤	خدمات صب معادن أخرى غير حديدية	٣
٢٩	صناعة الآلات (الماكينات)	٢
٢٩٦٠	سلاح وذخيرة	١
٣١	إنتاج آلات ومعدات كهربائية مختلفة	
٣١٤٠	مركمات وبطاريات من الخلايا الأولية، خلايا أولية إنتاج	٢
٣٤	صناعة عائدة للمواصلات	
٣٤١٠	إنتاج سيارات	٢
٣٤٢٠	صنع عربات وكروسري للسيارات والشاحنات والمقطورات	٣
٣٥	النقل	
٣٥١١	بواخر	٣
٣٧	إعادة تصنيع	
٣٧١٠	إعادة تصنيع الدهان	٣
٣٧٢٠	إعادة استعمال النفايات الغير معدنية	٢

ملحق رقم ٢:
المشاريع التي تستلزم تقرير فحص بيئي مبدئي

ملحق رقم ٢: المشاريع التي تستلزم تقرير فحص بيئي مبدئي

١. الري والصرف:
- شبكات الري إذا زاد طولها عن كيلومتر

٢. مياه الشفة:
- إنشاء محطات معالجة المياه

٣. المياه المبتذلة:
- إنشاء شبكات الصرف الصحي

٤. الزراعة والغابات:
- مشاريع التشجير

٥. مشاريع توسيع الطرق والجسور والسكك الحديدية

٦. إعادة تأهيل المطارات والمرافئ (دون التوسيع)

٧. توليد وتوزيع الطاقة الكهربائية:
- خطوط التوزيع (التوتر العالي)

٨. النفط:
- إنشاء محطات توزيع المشتقات النفطية

٩. إنشاء المستشفيات

١٠. المشاريع السياحية والترفيهية:
- إنشاء أي مشروع سياحي أو ترفيهي بما فيه الفنادق والمجمعات البحرية والمنتزهات والمحميات

١١. المشاريع السكنية:
- إنشاء المباني العالية (التي تزيد عن خمسة عشر طابقا)
- إنشاء المجمعات السكنية

١٢. الضم والفرز

١٣. المزارع المصنفة فئة أولى وثانية

١٤. المصانع:
- الصناعات المذكورة في الجدول أدناه:

الرقم ISIC	الصنف/ المادة		الفئة
د	صناعة		
١٥	صناعة المواد الغذائية		
١٥١١	لحوم طازجة ومحفوظة (لا تشمل الطيور الداجنة والمسالخ)		٣
١٥١٢	لحوم الطيور الداجنة – طازجة ومحفوظة لا تشمل المسالخ		٣
١٥١٣	تصنيع منتجات اللحوم بجميع أصنافها		٣
١٥٢٠	منتجات سمكية محفوظة مصنعة		٣ ٢
١٥٣١	بطاطا مصنعة ومحفوظة		٤
١٥٣٢	عصير الخضار والفواكه [أنظر المرسوم رقم ١٠٨/٨٣]		٤
١٥٣٣	خضار وفواكه مصنعة ومحفوظة – غ م س	ط.أ. > ٢٥٠٠٠ ط/ع ط.أ. =< ٢٥٠٠٠ ط/ع	٤ ٣
١٥٤١	زيوت وشحوم خام	نباتي حيواني	٣ ٢
١٥٤٢	زيوت وشحوم مكررة	نباتي حيواني	٣ ٢
١٥٥١	صناعة مشتقات الحليب	ما بين ١ طن و ٢,٥ طن/ى ط.أ. =< ٢,٥ طن/ى	٤ ٣
١٥٥٢	البوظة والمثلجات المعدة للاستهلاك [أنظر المرسوم رقم ١٠٨/٨٣]	ما بين ١ طن و ٢,٥ طن/ى ط.أ. =< ٢,٥ طن/ى	٤ ٣
١٥٦١	نتاج مطاحن الحبوب	ط.أ. > ٥ ط/س ط.أ. =< ٥ ط/س	٤ ٢
١٥٦٢	النشويات والمنتجات النشوية	ط.أ. > ٥ ط/س ط.أ. =< ٥ ط/س	٣ ٢
١٥٧١	علف مصنع للحيوانات الداجنة	نباتي حيواني : خلط	٤ ٣
١٥٧٢	أغذية معدة للحيوانات المنزلية		٣
١٥٨٢	بسكويت وحلويات محفوظة		٤
١٥٨٤	كاكاو، وشوكولاته وسكاكر		٤
١٥٨٥	معكرونة، شعيرية وغيرها من المعجنات صناعة		٤ ٣
١٥٨٦	بن وشاي	تحميص البن	٤
١٥٨٩	منتجات غذائية أخرى		٤
١٥٩١	مشروبات كحولية مقطرة	انتاج < ١٠٠٠٠ ليتر /ع انتاج =< ١٠٠٠٠ ليتر /ع تعبئة بالقناني	٤ ٣ ٤
١٥٩٢	كحول الأتيل		٣
١٥٩٣	خمور	انتاج < ١٠٠٠٠ ليتر/ع انتاج= > ١٠٠٠٠ ليتر/ع تعبئة بالقناني	٤ ٣ ٤
١٥٩٦	بيرة		٣
١٥٩٨	مياه معدنية ومشروبات غير كحولية [أنظر المرسوم رقم ١٠٨/٨٣]		٤
١٦	منتجات التبغ		
١٦٠٠	منتجات التبغ	(سجاير دون سيجار)	٣
١٧	المنتجات النسيجية		
١٧١٠	نسيج وخيوط ، غزل وتصنيع الصوف	طاقة =< ٢٥ ك و محركات	٤

	استعمال مواد كيماوية او قابلة للاشتعال (تبيض ، صباغ ، مرجل بخاري)	٣
١٧٢٠	الأقمشة النسيجية (حياكة) طاقة =< ٢٥ ك و محركات استعمال مواد كيماوية او قابلة للاشتعال (تبيض او صباغ)	٤ ٣
١٧٣٠	خدمات تكميلية نسيجية تبييض أو صباغ خدمات اخرى	٣ ٤
١٧٤٠	منتجات نسيجية مصنعة (لا تشمل الالبسة) ٢٥ ك و < طاقة < ١٠٠ ك و محركات طاقة =< ١٠٠ ك و محركات	 ٤ ٣
١٧٥١	سجاد وموكيت ما بين ٢٥ ك و و ١٠٠ ك و طاقة =< ١٠٠ ك و محركات	 ٤ ٣
١٧٥٢	حبال ومرس جدل وتشبيك	٤
١٧٥٤	خلافه من النسيج – غ م س	٤
١٧٦٠	أقمشة محاكة أو مطرزة أو محبوكة	٤
١٧٧١	جوارب وكولون محاكة أو محبوكة ط.أ. ٢٥ ك و محركات استعمال مواد كيماوية قابلة للاشتعال (تبيض ، صباغ ، مرجل بخاري)	 ٤ ٣
١٨	صناعة الملابس والمواد وصبغ الفرو	
١٨١٠	ملابس جلدية (دون تصنيع) ط.أ. = < ٣٥ ك و محركات	٤
١٨٢١	ملابس عمل ط.أ. =< ٣٥ ك و محركات	٤
١٨٢٢	ملابس خارجية ط.أ. = < ٣٥ ك و محركات	٤
١٨٢٣	ملابس داخلية ط.أ. =< ٣٥ ك و محركات	٤
١٨٢٤	ملابس مختلفة واكسسوار لها – غ م س ط.أ. =< ٣٥ ك و محركات	٤
١٨٣٠	فرو ومشتقاته ط.أ. =< ٣٥ ك و محركات	٤
١٩	صناعة الجلود	
١٩٢٠	شنط وحقائب وأسرجة وبراذع وأحزمة (دون تصنيع الجلد) طاقة =< ٢٥ ك و محركات	٤
١٩٣٠	أحذية على اختلافها (لا يشمل تصنيع الجلد) طاقة =< ٣٥ ك و محركات – تصنيع لوازم الاحذية من لدائن ومركبات كيميائية	٤ ٣
٢٠	صناعة المفروشات والخشب	
٢٠١٠	خشب منشور أومقشوط طاقة =< ١٠٠ ك و (استعمال مواد مذيبة)	٣ ٣
٢٠٢٠	ألواح من الخشب المضغوط أو المعاكس او الفايبر وغيره طاقة = < ١٠٠ ك و (استعمال مواد مذيبة)	 ٣ ٣
٢٠٣٠	نجارة التركيب والتوصيل طاقة =< ١٠٠ ك و	٣
٢٠٤٠	حاويات خشبية طاقة =< ١٠٠ ك و	٣
٢٠٥١	منتجات خشبية أخرى طاقة =< ١٠٠ ك و	٣
٢١	صناعة الورق	
٢١١٢	الورق والكرتون استعمال مواد كلورية بدون مواد كلورية	٢ ٣
٢١٢١	منتجات التغليف والتعبئة من الكرتون المموج	٤
٢١٢٢	المنتجات الورقية للاستعمال المنزلي	٤
٢١٥٢	منتجات مختلفة من الورق والكرتون – غ م س	٤
٢٢	النشر والطباعة ووسائل الإعلان	
٢٢١١	كتب طباعة طباعة مع تجفيف بالنار	٥ ٣

٢٤	الصناعات الكيماوية		
٢٤١٢	صبغ وخضب		٢
٢٤٣٠	دهانات وفارنيش وغيرها من الطلاءات، حبر طباعة وعلك مزج الطلاء والحبر والدهان		٣
٢٤٤١	منتجات طبية أساسية [أنظر المرسوم رقم ٨٣/١٠٥]		٣
٢٤٤٢	تحضيرات طبية [أنظر المرسوم رقم ٨٣/١٠٥]		٤
٢٤٥١	مستحضرات الصابون ومساحيق التنظيف والتطهير والتلميع		٣
٢٤٥٢	المستحضرات العطرية ولوازم الزينة		٣
٢٤٦٢	صمغ وجيلاتين	من المواد الحيوانية الخام	٣
		دون مواد حيوانية خام	٤
٢٤٦٤	مواد كيماوية للتصوير		٣
٢٤٦٦	مواد كيماوية أخرى – غ م س		٣
٢٥	المطاط والبلاستيك		
٢٥١١	اطارات وانابيب من الكاوتشوك		٢
٢٥١٢	إطارات وأنابيب من الكاوتشوك معاد تصنيعها		٢
٢٥١٣	منتجات مطاطية أخرى		٢
٢٥٢١	ألوح وأنابيب وسحب البرافيل بلاستيكية		٣
٢٥٢٢	منتجات بلاستيكية(للصر) والتغليف		٣
٢٥٢٣	ثياب بلاستيكية واقية		٣
٢٥٢٤	مواد بلاستيكية أخرى		٣
٢٦	مواد بناء		
٢٦١١	زجاج مسطح	طاقة < ١٠٠ ك و	٤
		طاقة =< ١٠٠ ك و	٣
٢٦١٢	زجاج مسطح مصنع ومشغول	طاقة < ١٠٠ ك و	٤
		طاقة =< ١٠٠ ك و	٣
٢٦١٣	زجاج مفرغ	طاقة < ١٠٠ ك و	٤
		طاقة =< ١٠٠ ك و	٣
٢٦١٥	زجاج مصنع على أنواعه بما فيه المعدات الزجاجية التكنيكية	طاقة < ١٠٠ ك و	٤
		طاقة =< ١٠٠ ك و	٣
٢٦٢١	أدوات منزلية وتزيين من سيراميك (خزفية)	طاقة < ١٠٠ ك و	٤
		طاقة =< ١٠٠ ك و	٣
٢٦٢٢	أدوات صحية سيراميك		٣
٢٦٢٤	أدوات سيراميك فنية		٣
٢٦٢٦	منتجات سيراميك حرارية (مقاومة للحرارة)		٣
٢٦٣٠	بلاط وقناني سيراميك		٣
٢٦٤٠	بلاط وحجارة ومنتجات قرميدية مصنعة من الطين المجفف		٣
٢٦٦١	مصبوبات الاسمنت للبناء	دون مكابس وآلات ارتجاج	٤
		مع مكابس وآلات ارتجاج	٣
٢٦٦٢	منتجات جبسية للبناء		٣
٢٦٦٣	باطون للخلط	ط.أ. < ٥٠ ط/ي	٣
		ط.أ. =< ٥٠ ط/ي	٢
٢٦٦٦	منتجات أخرى من الجبس والباطون الاسمنتي		٣
٢٦٧٠	حجارة للمباني التذكارية		٣
٢٦٨٠	منتجات منجمية اخرى غير ممعدنة – غ م س	دون اسبست	٤
٢٦٨١	منتجات حاكة (سنغرة)		٤
٢٦٨٢	منتجات منجمية أخرى غير معدنية – غ م س		٤
٢٧	صناعة المعادن الأولية		

٢٧٣١	منتجات حديدية مسحوبة على البارد	٤ م.ع>١٠٠٠ متر٢ ٣ م.ع=<١٠٠٠ متر٢
٢٧٣٢	لوحات رفيعة مدلفنة على البارد	٤ م.ع>١٠٠٠ متر٢ ٣ م.ع=<١٠٠٠ متر٢
٢٧٣٤	شريط معدني	٤ م.ع>١٠٠٠ متر٢ ٣ م.ع=<١٠٠٠ متر٢
٢٧٤٢	ألمنيوم تجميع	٤
٢٨	المنتجات المعدنية والكهربائية الفنية	٣
٢٨١١	المنشآت المعدنية وأجزاءها	٤
٢٨١٢	الحدادة والتوصيلات المعدنية	٣
٢٨٢١	الخزانات والحاويات المعدنية	٣
٢٨٢٢	رديأتورات وغلايات للتدفئة المركزية	٣
٢٨٣٠	مولدات البخار (لا تشمل غلايات التدفئة المركزية)	٣
٢٨٤٠	خدمات تحديد، كبس، دك وتسوية سحب المعادن – مينالوروجيا المساحيق	٢
٢٨٥١	خدمات معالجة طلاء المعادن –كهربائي – غير كهربائي	٣
		٤
٢٨٦١	أدوات القطع	٤
٢٨٦٢	عدة	٤
٢٨٦٣	أقفال ومفصلات	٣
٢٨٧١	براميل فولاذية وأوعية مشابهة	٣
٢٨٧٢	أوعية من المعادن الخفيفة	٤
٢٨٧٣	منتجات سلكية	٣
	مع عوازل كيمائية	٣
٢٨٧٥	منتجات معدنية مصنعة أخرى – غ م س	٢
٢٩	صناعة الآلات (الماكينات)	٣
٢٩١١	محركات وتربينات (لا يشمل الطيران، السيارات، المحركات الدورية)	٣
٢٩١٢	مضخات وكمبرسورات	٣
٢٩١٣	صمامات وحنفيات	٣
٢٩١٤	محملات، تروس ومسننات وعناصر دافعة	٣
٢٩٢١	مواقد ومحارق	٣
٢٩٢٢	معدات رفع وعمل	٣
٢٩٢٣	معدات تبريد وتهوئة غير منزلية	٣
٢٩٢٤	آلات ومعدات لاستعمالات مختلفة – غ م س	٣
٢٩٣١	جرارات زراعية	٣
٢٩٣٢	آلات زراعية وحرجية أخرى	٣
٢٩٤٠	عدة مكينات	٣
٢٩٥١	آلات للأعمال المعدنية	٣
٢٩٥٢	آلات للتنجيم والمقالع والبناء	٣
٢٩٥٣	آلات لتصنيع المشروبات والأغذية والتبغ	٣
٢٩٥٤	آلات للنسيج والألبسة والأعمال الجلدية	٣
٢٩٥٦	آلات لاستعمالات مختلفة – غ م س	٣
٢٩٧١	أجهزة كهربائية منزلية ط.أ. =< ٥٠ ط/ع	٣
٢٩٧٢	أجهزة منزلية غير كهربائية ط.أ. =< ٥٠ ط/ع	
٣٠	كمبيوتر وآلات مكتبية	٤
٣٠٠١	إنتاج آلات مكتبية	٤
٣٠٠٢	إنتاج كمبيوتر (الحاسوب)	
٣١	إنتاج آلات ومعدات كهربائية مختلفة	

٣١١٠	محركات كهربائية، مولدات ومحولات		٤
٣١٢٠	توزيع الكهرباء وأجهزة التحكم		٣
٣١٣٠	أسلاك وكابلات معزولة		٤
٣١٥٠	معدات ومصابيح إنارة		٤
٣١٦١	معدات كهربائية للمحركات وللسيارات – غ م س		٤
٣١٦٢	معدات كهربائية مختلفة – غ م س		
٣٢	صناعة الأجهزة السمعية والبصرية (الفيديو) والاتصالات		٣
٣٢١٠	صمامات وأنابيب اليكترونية وغيرها من العناصر الاليكترونية		٤
٣٢٣٠	أجهزة التسجيل والبث ومشتقاتها		
٣٣	معدات طبية وبصرية		٤
٣٣١٠	معدات طبية وجراحية		٤
٣٣٤٠	أجهزة بصرية ومعدات فوتوغرافية		
٣٤	صناعة عائدة للمواصلات		٤
٣٤٣٠	قطع وأكسسوار للسيارات ومحركاتها	ط.أ. < ٥٠ ط/ع	٣
		ط.أ. => ٥٠ ط/ع	
٣٥	النقل		٣
٣٥٤٣	عربات للمعوقين		٣
٣٥٥٠	وسائل نقل اخرى – غ م س		
٣٦	صناعة أدوات وتجهيزات مختلفة	ط.أ. => ٥٠ ط/ع	٣
٣٦١١	كراسي ومقاعد	ط.أ. => ٥٠ ط/ع	٣
٣٦١٢	تجهيزات مكتبية ومتاجر	ط.أ. => ٥٠ ط/ع	٣
٣٦١٣	تجهيزات مطبخية	ط.أ. => ٥٠ ط؟ع	٣
٣٦١٤	مفروشات وتجهيزات مختلفة	ط.أ. => ٥٠ ط/ع	٣
٣٦١٥	فرش	ط.أ. => ٥٠ ط/ع	٤
٣٦٢٢	مجوهرات وتوابعها – غ م س	ط.أ. => ٥٠ ط/ع	٣
٣٦٤٠	لوازم ومعدات رياضية	استعمال مواد كيماوية او مواد قابلة للاشتعال	٣
		ط.أ. => ٥٠ ط/ع	٣
٣٦٥٠	ألعاب	استعمال مواد كيماوية او مواد قابلة للاشتعال	٣
٣٦٦٣	منتجات مصنعة أخرى – غ م س		

ملحق رقم ٣:
المناطق الحساسة بيئياً

ملحق رقم ٣: المناطق الحساسة بيئياً

١. المناطق المصنفة قانونياً محميات طبيعية أو غابات طبيعية أو حدائق عامة أو مواقع طبيعية أو مواقع سياحية أو مواقع تاريخية و/أو أثرية أو حرم انهر أو ينابيع أو حرم مقدسة.

٢. المناطق التي تشكل موطناً للأصناف المهددة بالانقراض (الحيوانات والنباتات).

٣. المستنقعات.

٤. المناطق المعرضة للكوارث الطبيعية (الأخطار الجيولوجية، الفيضانات، الزلازل، الانهيالات، ...).

٥. المناطق الشديدة الانحدار.

٦. الشواطئ البحرية ومجاري الأنهر والينابيع.

٧. الأراضي الأميرية.

ملحق رقم ٤:
نموذج التصنيف لتقييم الأثر البيئي

ملحق رقم ٤: نموذج التصنيف لتقييم الأثر البيئي

١. اسم المشروع:

٢. صاحب المشروع:
- ◻ الاسم:
- ◻ العنوان:
- ◻ رقم الهاتف:
- ◻ رقم الفاكس:
- ◻ البريد الإلكتروني:

٣. صنف المشروع:
- ◻ عام
- ◻ خاص
- ◻ صناعي (مع تحديد رقم ISIC):
- ◻ سياحي (مع التحديد):
- ◻ خدماتي (مع التحديد):
- ◻ غيره:

٤. طبيعة المشروع:
- ◻ مشروع جديد
- ◻ توسيع لمشروع موجود

٥. أهداف المشروع:

٦. الكلفة المقدرة للمشروع:
- ◻ إنشاء:
- ◻ تجهيز:

٧. البرنامج الزمني للمشروع:

	البداية	النهاية
التخطيط والتصميم		
الإنشاء		
الإشغال		

٨. خريطة تبين موقع المشروع - مقياس ١/٢٠،٠٠٠ (مرفقة)
خريطة مساحة

ملاحظة: يجوز لوزارة البيئة أن تطلب مستندات أخرى تتلاءم مع طبيعة المشروع.

قرار التصنيف لتقييم الأثر البيئي
(يتم ملء هذه الفقرة من قبل وزارة البيئة)

ملحق رقم ٥:
لائحة بالمعنيين المحتملين

ملحق رقم ٥: لائحة بالمعنيين المحتملين

١- كافة الوزارات المعنية.

٢- المؤسسات الرسمية ذات الصلة على سبيل المثال وليس الحصر مجلس الإنماء والإعمـــار ومؤسسة تشجيع الاستثمارات في لبنان.

٣- السلطة البلدية والإدارة المحلية الصالحة في موضوع التنظيم.

٤- الجمعيات البيئية غير الحكومية المحلية التي تحمل علم وخبر.

٥- المجموعات المتضررة.

٦- الجامعات.

٧- أية منظمة خاصة يمكن أن تكون مهتمة بالمشروع على سبيل المثال وليس الحصر جمعية الصناعيين والنقابات المعنية.

ملحق رقم ٦:
المعلومات المطلوبة في تقرير الفحص البيئي المبدئي

ملحق رقم ٦: المعلومات المطلوبة في تقرير الفحص البيئي المبدئي

يجب أن يتضمن تقرير " **الفحص البيئي المبدئي** " المعلومات التالية (ليس بالضرورة وفقا للتسلسل الملحوظ):

١-مقدمة :
التعريف بالمشروع وتحديد صاحبه والشخص أو المكتب الذي يقوم بـ" الفحص البيئي المبدئي " وشرح مختصر لنوعية المشروع وحجمه وموقعه.

٢-إطار السياسات والأطر القانونية والإدارية:
تحقيق حول الأنظمة المطبقة والمبادئ والمواصفات المعمول بها في قطاع البيئة محليا ووطنيا. هذه المعلومات يجب أن تتناول تحديد الإدارة ذات الصلاحية وإمكانياتها على المستوى المحلي والوطني.

٣-وصف المشروع المقترح:
وصف أجزاء المشروع وبيان الخرائط المتعلقة بها على المقياس المناسب ، تظهر المعلومات العائدة لموقع المشروع والتصميم الشامل والحجم والسعة وبرنامج العمل والخدمات ومدة التشغيل الخ.

٤-وصف البيئة المحيطة بالمشروع:
جمع وتقييم المعلومات الرئيسية حول المميزات البيئية لموقع الدراسة (البيئة الفيزيائية والبيولوجية والاجتماعية والاقتصادية) مع الأخذ بعين الاعتبار أية تعديلات متوقعة قبل بدء المشروع وأية تغيرات مستقبلية محتملة. كما يجب تفادي ذكر أي معلومات لا علاقة لها بالمشروع.

٥-تحديد الآثار البيئية المحتملة للمشروع:
تقدير أية آثار سلبية أو ايجابية للمشروع على البيئة الفيزيائية والكيميائية والبيولوجية والاجتماعية والاقتصادية على المدى القصير والطويل.

٦-خطة الإدارة البيئية:
تلخص هذه الفقرة مجموعة التدابير التخفيفية ووسائل الرصد والمراقبة والإجراءات المؤسساتية التي سوف تتخذ خلال إنشاء وتشغيل وتفكيك المشروع والتي من شأنها إلغاء الآثار البيئية السلبية أو تخفيفها إلى مستويات مقبولة.

نويات التقرير.
علمية وغير العلمية التي استعملت لاعداد تقرير " **الفحص البيئي**

سماء معدي تقرير " **الفحص البيئي المبدئي** " (أفراد ومؤسسات).

ملحق رقم ٧:
المعلومات المطلوبة في تقرير برنامج تقييم الأثر البيئي

ملحق رقم ٧: المعلومات المطلوبة في تقرير برنامج تقييم الأثر البيئي

١-مقدمـــــة:
تحدد هذه الفقرة الهدف من برنامج " **تقييم الأثر البيئي** " وتعرف بالمشروع موضـــوع الدراسة وتشرح التدابير التنفيذية لـــ" **تقييم الأثر البيئي** ".

٢- معلومات مرجعية:
تتضمن هذه الفقرة المعلومات ذات العلاقة بالفرقاء المحتملين الذين قد يقوموا بدراســة " **تقييم الأثر البيئي** "، وتحقيق مختصر عن المحتويات الأساسية للمشــروع المقــترح، وتصريح عن ضرورة المشروع والحاجة إليه وعن الأهداف التي يبتغيــها، والمكتــب المنفذ، وملخص لتاريخ المشروع بما فيه البدائل التي تم درسها والمشــاريع المرتبطــة به. وتتم الإشارة إلى أية مشاريع قيد التنفيذ أو مخطط لها في ذات المنطقة قــد تكــون منافسة للمشروع المدروس بالنسبة لوحدة الموارد.

٣-الأهـــــــداف:
تحدد هذه الفقرة نطاق " **تقييم الأثر البيئي** " وتناقش توقيته بالنســبة لمراحــل إعــداد المشروع وتصميمـــــه وتنفيذه.

٤- متطلبات تقييم الأثر البيئي:
تحدد هذه الفقرة أية تنظيمات وتوجيهات تنظم إجراء " **تقييم الأثر البيئـــي** " أو تحــدد مضمون تقرير برنامج " **تقييم الأثر البيئي** ".

٥- منطقة الدراسة:
تحدد هذه الفقرة حدود المنطقة التي تغطيها الدراسة لأغراض " **تقييم الأثر البيئـــي** ". وإذا كانت هناك أية منطقة محاذية أو بعيدة يجب أن تدرس فــي مــا يتعلــق بالآثــار المحتملة لتنفيذ أو إدارة هذا المشروع، فيجب أن تدرج في متطلبــات تقريــر برنــامج " **تقييم الأثر البيئي** ".

٦- نطاق العمل:
في بعض الحالات يمكن معرفة المهمات التي يتعين على صاحب المشروع القيام بــها، بشكل واضح يتيح تحديدها بالكامل في تقرير برنامج " **تقييم الأثر البيئي** ". إنما فــي حــالات أخرى تظهر الحاجة إلى إجراء دراسات ميدانية متخصصة أو وضع نماذج بغية تقييم الآثــار التي يمكن أن يسفر عنها المشروع المقترح ، عندها يطلب من صاحب المشروع تحديد هــذه المهام المعينة بمزيد من التفصيل. ويشمل نطاق العمل النقاط التالية :

٦-١) إطار السياسات والأطر القانونية والإدارية:
تحقيق حول الأنظمة المطبقة والمبادئ والمواصفات المعمول بها في ميــدان البيئــة محليا ووطنيا (تحدد الدراسة الاعتبارات المعروفة ويطلب من صاحب المشــروع أن يتحقق من وجود اعتبارات أخرى). هذه المعلومات يجب أن تتناول تحديــد الإدارة ذات الصلاحية وإمكانياتها على المستوى المحلي والوطني.

٦-٢) المساعدة في التنسيق بين الإدارات الرسمية ومشاركة العامة:
المساعدة في تنسيق الدراسة مع الإدارات والمصالح الرسمية وفي الحصول على رأي المنظمات غير الحكومية المحلية والمجموعات التي تتأثر بالمشروع المقترح وفي حفظ محاضر الاجتماعات وسائر النشاطات والاتصالات والتعليقات وأسلوب التصرف بها (ويحدد برنامج " **تقييم الأثر البيئي** " أنواع النشاطات مثل اجتماع تحديد نطاق العمل تشارك فيه الجهات المعنية وجلسات إعلامية في قطاع البيئة لموظفي المشروع، ومساندة المستشارين في قطاع البيئة، وندوات عامة الخ.).

٦-٣) وصف المشروع المقترح:
وصف أجزاء المشروع وبيان الخرائط المتعلقة بها على المقياس المناسب ، تظهر المعلومات العائدة لموقع المشروع ، التصميم الشامل والحجم والسعة وبرنامج العمل والخدمات ومدة التشغيل الخ.

٦-٤) وصف البيئة المحيطة بالمشروع:
جمع وتقييم المعلومات الرئيسية حول المميزات البيئية لموقع الدراسة (البيئة الفيزيائية والكيميائية والبيولوجية والاجتماعية والاقتصادية) مع الأخذ بعين الاعتبار أية تعديلات متوقعة قبل بدء المشروع وأية تغيرات مستقبلية محتملة. و يجب تفادي ذكر معلومات لا علاقة لها بالمشروع.

٦-٥) تحديد الآثار البيئية المحتملة للمشروع المقترح:
يجب التمييز بين الآثار الإيجابية والآثار السلبية، الآثار على المدى القصير أو الطويل. ويجب تحديد الآثار الدائمة التي لا يمكن تجنبها وتحديد الآثار الكونية وتلك عبر الحدود. على صاحب المشروع أن يصف وسائل وتقنيات التقدير المستعملة لتقيم آثار المشروع على البيئة. يتم تحديد نطاق ونوعية المعلومات المتوفرة، مع شرح الفجوات الهامة في المعلومات وأية احتمالات مجهولة في ما يتعلق بإمكانية تقدير الآثار المحتملة للمشروع المقترح. من المستحسن عرض دفاتر الشروط لبعض الدراسات المزمعة بهدف الحصول على المعلومات الناقصة. يجب أن تظهر هذه الفقرة وسائل وتدابير التخفيف من كل اثر وتوحي بالتدابير الأجدى والأقل كلفة.

٦-٦) تحليل البدائل للمشروع:
وصف البدائل التي تمت دراستها خلال إعداد المشروع المقترح وذكر البدائل الأخرى التي يمكن أن تحقق الأهداف ذاتها. يشمل مفهوم البدائل اختيار موقع المشروع وتصاميمه والتكنولوجيا الخاصة به، وأساليب التشييد مع تحديد مراحله، وإجراءات تشغيله وصيانته. كما يتم مقارنة البدائل من حيث الآثار البيئية المحتملة، وتكاليفها من حيث رأس المال والتشغيل، وملاءمتها للأوضاع المحلية، والمتطلبات المؤسساتية والتدريبية ومتطلبات الرصد والمراقبة. ويجب، ضمن الممكن، تحديد كلفة وأرباح كل البدائل، إضافة إلى الكلفة المقدرة للتدابير التخفيفية. كما يجب إدراج البديل المتمثل في عدم إنشاء المشروع، بغية إيضاح الأوضاع البيئية حسب ما هي بدون المشروع.

٦-٧) خطة الإدارة البيئية:

- التدابير التخفيفية للآثار السلبية
- خطة الرصد والمراقبة
- خطة تنمية القدرات المؤسساتية لتنفيذ التوصيات المدرجة في " تقييم الأثـــر البيئي ".

على صاحب المشروع أن يعد خطة مفصلة لإدارة البيئة تشـــمل كافـــة الآثـــار والتدابير التخفيفية وبرنامج الرصد والمراقبة واحتياجات العـــاملين والمؤسســـات لتطبيق هذه التدابير. كما يجب تحديد التعويض على المتضررين من جراء الآثـــار غير القابلة للتخفيف.

٧- التقرير:

إن تقرير تقييم الأثر البيئي يجب أن يكون موجزاً مقتصـــراً علـــى القضايـــا البيئيـــة الأساسية. يرتكز النص الرئيسي على نتائج التحقيقات والخلاصة والتوصيات العمليـــة مدعومة بملخصات المعلومات التي تم جمعها واشارة إلى أية مراجع معتمـــدة لشـــرح وتفسير هذه المعلومات. وتعتبر المعلومات التفصيلية أو غير الموضحة غـــير مناســـبة في النص الرئيسي ويجب عرضها في الملاحق او في مستند مستقل. كذلـــك بالنســـبة للمستندات غير المنشورة المستعملة في دراسة " تقييم الأثر البيئي " لجهة جمعها فـــي ملحق.

يتضمن تقرير " تقييم الأثر البيئي " إلزاميا ما يلي:

- ملخص تنفيذي
- إطار السياسات والأطر القانونية والإدارية
- مشاركة العامة
- وصف المشروع المقترح
- وصف البيئة المحيطة بالمشروع
- الآثار البيئية المحتملة
- تحليل البدائل
- خطة الإدارة البيئية
- الملاحق:
  - لائحة بمحتويات التقرير
  - محاضر مشاركة العامة
  - ملخص عن المستندات المرتبطة بالمشروع
  - جداول وبيانات بالمعلومات
  - لائحة بالتقارير ذات الصلة
  - لائحة بالمراجع العلمية وغير العلمية التي استعملت
  - لائحة بأسماء معدي تقرير " تقييم الأثر البيئي " (أفراد ومؤسسات)

ملحق رقم ٨:
المعلومات المطلوبة في تقرير تقييم الأثر البيئي

ملحق رقم ٨: المعلومات المطلوبة في تقرير تقييم الأثر البيئي

إن تقرير " **تقييم الأثر البيئي** " يجب أن يتضمن النقاط التالية (ليس بالضرورة وفقا للتسلسل الملحوظ أدناه):

١-ملخص تنفيذي

٢- مقدمة
- الهدف وتبرير المشروع:
  - تحديد المشروع وصاحب المشروع
  - وصف مختصر لنوعية وحجم وموقع المشروع
  - أهمية المشروع للبلد
- نطاق دراسة " **تقييم الأثر البيئي** " ويشمل الشخص او الوكالة التي أعدت الدراسة

٣- إطار السياسات والأطر القانونية والإدارية:
- السلطة ذات الصلاحية وإمكانياتها على المستوى المحلي والوطني
- التشريعات البيئية وتلك المتعلقة بالبيئة والتنظيمات والسياسة المتبعة في البلد
- المتطلبات البيئية لأي من المشاركين في التمويل
- الاتفاقيات أو المعاهدات البيئية المطبقة والتي انضم إليها البلد

٤- مشاركة العامة:
- الوكالات الرسمية
- المنظمات غير الحكومية
- المجموعات المتضررة من المشروع

٥- وصف المشروع:
- نوع المشروع
- موقع المشروع: الخرائط التي تشير إلى موقع المشروع ومدى تأثيره
- حجم المشروع بما فيه النشاطات المرتبطة به المطلوبة منه او له
- البرنامج المقترح للموافقة والتنفيذ

٦- وصف البيئة المحيطة بالمشروع:

٦-١) البيئة الفيزيائية والكيميائية:
- طوبوغرافية الأرض وجيولوجية الأرض ودراسة تأثير الزلازل
- دراسة المياه السطحية والمياه الجوفية
- المقاييس البحرية والساحلية
- الوسائل الموجودة لصرف المياه الملوثة ونوعية المياه
- نوعية الهواء المحيط ومصادر تلوث الهواء الموجودة
- المناخ والرصد الجوي
- الضجيج

٦-٢) البيئة البيولوجية:

- النباتات والحيوانات
- الأسماك والكائنات الحية المائية
- الأجناس النادرة أو المعرضة للخطر
- المناطق الحساسة (غابات – محميات طبيعية - منتزهات طبيعية)

٦-٣) البيئة الاجتماعية والاقتصادية:

- العنصر الديموغرافي (السكان – النسيج الاجتماعي – العمالة – توزيع المداخيل – العادات والتقاليد - تطلعات السكان)
- نشاطات التنمية (البنية التحتية – الصناعة – الزراعة – المؤسسات – السياحة – الترفيه – الخ.)
- استعمال الأراضي
- الصحة العامة
- التراث الأثري والتاريخي
- القيم الجمالية
- القيم الحضارية والثقافية (عادات وتقاليد وتطلعات)

٧- الآثار البيئية المحتملة :

٧-١) البيئة الفيزيائية والكيميائية

٧-٢) البيئة البيولوجية

٧-٣) البيئة الاجتماعية و الاقتصادية

٨- تحليل البدائل:

- في حال عدم إنشاء المشروع
- مشاريع بديلة ذات الأهداف نفسها
- المشروع ذاته مع تقنيات بديلة
- قارنة الإمكانيات المختلفة اقتصادياً وبيئياً

٩- خطة الإدارة البيئية:

٩-١) برنامج التخفيف من الآثار السلبية:

- ملخص عن الآثار البيئية المهمة
- تفصيل تقني لكل من التدابير التخفيفية (على أي تأثير يتم تطبيقها وما هي شروط تطبيقها – تصاميمها – تفصيل التجهيزات – إجراءات التشغيل)
- الآثار البيئية المحتملة لهذه التدابير
- ارتباط هذه التدابير ببرامج تخفيفية أخرى

٩-٢) برنامج الرصد والمراقبة:

- تفصيل تقني محدد لوسائل المراقبة (المعايير الخاضعة للمراقبة - أساليب المراقبة – دورية المراقبة المطلوبة – أماكن المراقبة – إجراء القياسات – حفظ المعلومات وتحليلها – إجراءات الطوارئ)
- إجراءات رفع التقارير

- موازنة مفصلة وبرنامج اقتناء التجهيزات والإمدادات اللازمة

٩-٣) برنامج تقوية القدرات المؤسساتية:

- وصف مفصل للتدابير المؤسساتية اللازمة للقيام بالإجراءات البيئية المذكورة (المسؤولية عن القيام بالتدابير التخفيفية وإجراءات المراقبة الخ.)
- برامج المساعدة التقنية
- اقتناء التجهيزات والإمدادات
- التعديلات التنظيمية

١٠- خلاصة:

- الربح الصافي العام الذي يبرر تطبيق المشروع
- شرح كيفية تخفيف الآثار السلبية
- الاستعدادات المسبقة لمتابعة المراقبة

١١- الملاحق:

- محتويات التقرير
- محاضر مشاركة العامة
- ملخص عن المستندات المرتبطة بالمشروع
- جداول وبيانات بالمعلومات
- لائحة بالتقارير ذات الصلة
- لائحة بالمراجع العلمية وغير العلمية التي استعملت
- لائحة بأسماء معدي تقرير " **تقييم الأثر البيئي** " (أفراد ومؤسسات)

F. IMPACT ASSESSMENT: IDENTIFICATION, ANALYSIS, PREDICTION, SIGNIFICANCE

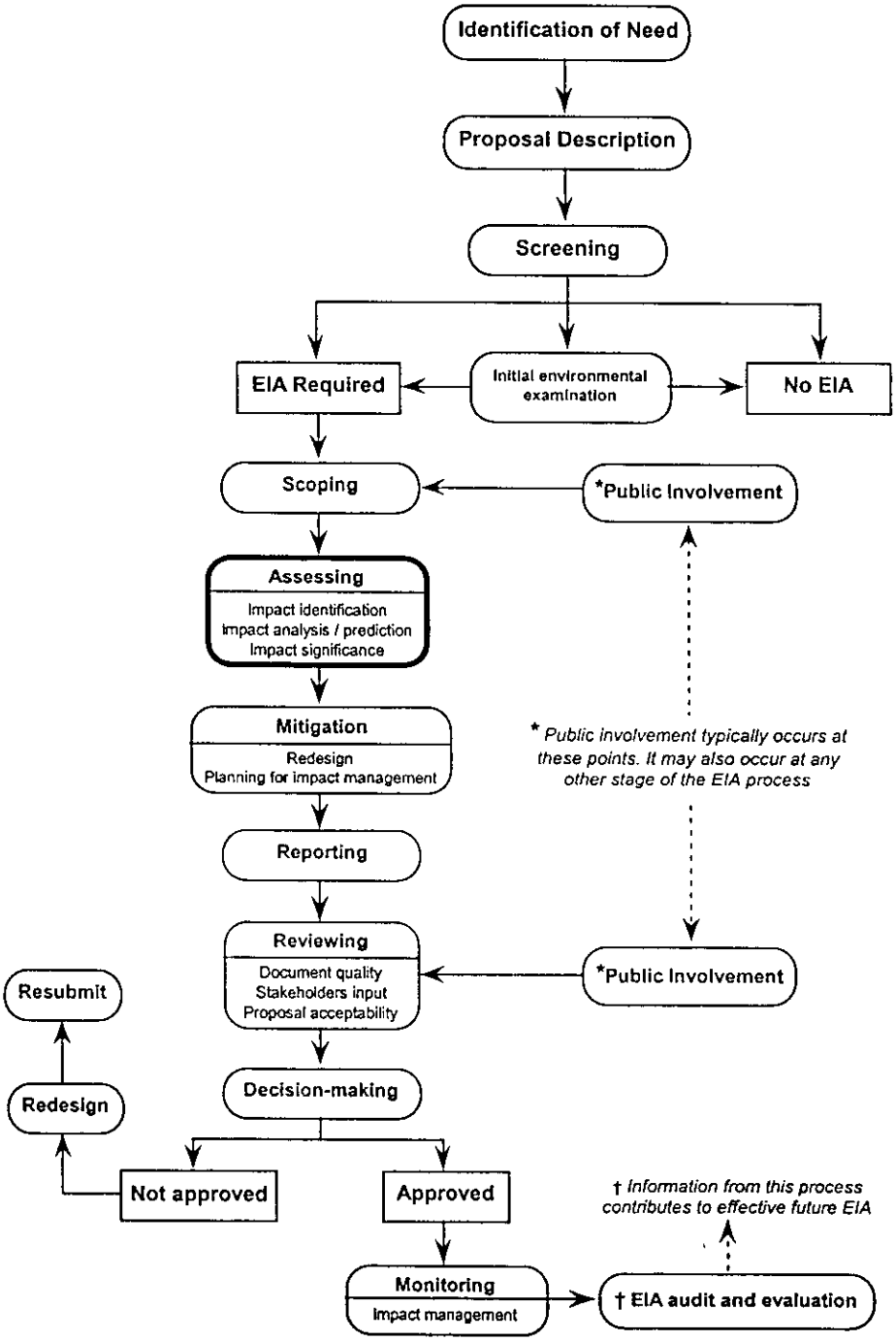


Figure F.1. Impact assessment in the EIA process

F.1. Description of Environmental Setting

The 'assessing' phase of the EIA is the time when most of the work involved in impact assessment is carried out (Figure F.1). Assessing usually involves three main tasks:

- Further and more detailed work on impact identification refining the understanding of the nature of impacts, identifying indirect, cumulative and other impacts and ensuring identification of the likely causes of the impacts;
- Detailed analysis of the impacts to determine their nature, magnitude, extent and effect; and
- Judgement of the significance of impacts (whether they matter and whether mitigation is needed).

In the early years of EIA, environmental impacts were considered to be impacts on the natural, biophysical environment (such as effects on air and water quality, flora and fauna, noise levels, climate and hydrological systems). However, the focus on biophysical impacts alone did not last long. The institutionalization of EIA, with its public disclosure and consultation processes, seemed to act as a magnet to individuals, groups and agencies who wanted other kinds of impacts to be incorporated in decisions. They were assisted to some extent by the evolving definition of the term 'environment' which has increasingly broadened to incorporate social and other aspects (Bisset, 1996). In 1994, the Development Assistance Committee of the OECD (1994) defined 'environment' for the purposes of EIA to include:

- Effects on human health, well-being, environmental media, ecosystems and agriculture;
- Effects on climate and the atmosphere;
- Use of natural resources (regenerative and mineral);
- Utilization and disposal of residues and wastes; and
- Resettlement, archaeological sites, landscape, monuments and social consequences as well as upstream, downstream and trans-boundary effects.

Therefore, since the mid 1970s, additional types of impacts have been identified as requiring analysis and evaluation prior to their consideration in decision-making. The scope of EIAs widened to incorporate social, health, economic and other issues. However, it should be stressed that despite the general tendency to move towards this approach, the trend has not been universal. One alternative approach has been to supplement EIAs with related, but separate, specific studies (and reports) on non-biophysical impacts when they are considered to be particularly important for decision-makers.

F.2. Methods for Impact Identification: Matrices, Networks and Checklists

A logical and systematic approach needs to be used to refine the list of impacts that require detailed investigation and to ensure that all likely causes of impacts and the interactions between them are identified. While many people undertake these tasks using an ad hoc approach on a case by case basis, experience has shown that EIAs managed in this way often become unstructured and undisciplined and frequently fail to identify all of the significant impacts. They also tend to result in lengthy, descriptive collections of information that do not provide a suitable basis for decision-making.

Over time, a number of formalized EIA methodologies or aids have been developed to improve the effectiveness and efficiency of identification of impacts (some of them are also useful tools for presenting the results of the impact assessment or assigning significance). These methodologies have been based on the collective experience of a wide range of people and their use helps to streamline the EIA process and avoid many of the errors made in earlier EIAs. Many of these EIA methodologies have also been tailored for use in specific sectors thereby increasing the efficiency and accuracy of the impact identification process even further. The most common formal methods used for impact identification are:

- Matrices
- Networks
- Checklists
- Overlays and geographic information systems (GIS)
- Expert systems
- Professional experience

Matrices (Typical example in Handout F-1)

Matrices are grid-like tables that can be used to identify the interaction between project activities and environmental characteristics. Using the table, an interaction between an activity and an environmental characteristic can be noted in the cell that is common to both in the grid. 'Comments' can be 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.

The best known interaction matrix is that developed by (Leopold *et al.*) This comprehensive matrix has 88 environmental characteristics along the top of the table and 100 project actions in the left hand column and is suitable for use in most construction projects. The general approach taken by the Leopold matrix has been widely adapted and used to develop other matrices.

Networks (Typical example in Handout F-2)

Networks illustrate the multiple links between project activities and environmental characteristics and are therefore useful in identifying and depicting second-order impacts (indirect, synergistic etc). Simplified networks, used in conjunction with other methods, are useful in helping ensure that major second-order impacts have not been omitted from the investigations. More detailed networks can be time-consuming and difficult to produce unless a computer program is used for the task.

Checklists (Typical examples in Handout F-3 and Handout F-4)

Checklists are usually developed from lists of environmental features or activities that should be investigated for possible impacts. They can vary in complexity and purpose from a very simple list to a system that also assigns significance through the scaling and weighting of impacts. Checklists can be improved and adapted to suit local conditions as experience with their use is gained. They can also be developed to be specific to generic sectors (such as dams or road building). Sectoral checklists are often useful when proponents specialize in one particular area of development. Checklists are not effective in identifying higher order impacts or the inter-relationships between impacts and therefore, when used, care must be taken to consider whether impacts other than those listed may be important.

Overlays and geographic information systems

Map overlays or computer images can be used to display impacts pictorially. The original, and relatively simplistic, overlay technique was developed by McHarg who mapped data onto transparencies so that they could be superimposed to gain an overall visual impression of the concentration of impacts. This system was somewhat limited in its application. A more modern version of the method is the computer data-based geographical information system or GIS. GIS systems divide a map of an area into cells and for each cell they store a large range of information. This can be used for analysis and computer modeling purposes. The

greatest disadvantage with GIS systems at present is the lack of appropriate data and the expense involved in putting it into a GIS system. As GIS systems become more common place these problems will be resolved.

Computer expert systems

An expert system is a computerized knowledge-based decision-making system. The user is systematically presented with questions that have been developed from existing knowledge of the system and the interrelationships being investigated. The expert system reviews the answer given to each question and moves to the next question as appropriate given the response. Like GIS systems, expert systems are particularly information-intensive methods of analysis. They also have the potential to be very powerful in the future because they logically and systematically build upon experience over time.

Professional experience

Although not strictly a formal method, many professionals use the knowledge and expertise they gain in their work to systematically develop data-banks and technical aids that can be used to assist in future projects.

Factors Affecting Choice of EIA method

No single impact identification methodology is necessarily the best to use on all occasions nor is it necessary to be restricted to using only one method at a time. It is often found that combining the useful aspects of two different techniques may be the best approach to take. It should also be remembered that some of the methods also undertake other functions that may be useful to the EIA team. The choice of methodology can depend upon a number of factors including:

- Type and size of the proposal;
- Type of alternatives also being assessed;
- Nature of the likely impacts;
- Nature and appropriateness of the impact identification method;
- Experience of the EIA team with the impact identification method;
- Resources available - cost, information, time, personnel;
- Nature of the public involvement in the process;
- Experience of the proponent with the project type and size; and
- Any procedural/administrative requirements or constraints.

If you use impact identification methods (aids such as checklists or matrices) developed by others for their own purposes, care should be taken to ensure that these are suitable for your specific situation. In particular, care should be taken to make sure that any extreme environmental features peculiar to the region in which the project is proposed are adequately catered for (e.g. flood, drought, temperature, seismic activity, land instability, disease vectors etc.) (Table F.1).

Table F.1. Main advantages and disadvantages of impact identification methods

	Advantages	*Disadvantages*
Checklists (Simple ranking and weighting)	❑ Simple to understand and use ❑ Good for site selection and priority setting	❑ 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

	Advantages	*Disadvantages*
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

Impact Analysis/Prediction

Once the range impacts have been identified, the potential size and nature of each one must be predicted. Prediction draws on physical, biological, socio-economic and anthropological data and techniques and may employ mathematical models, photomontages, physical models, socio-cultural models, economic models, experiments or expert judgements *(Handout F-5)*. In many cases this work will need to be carried out by specialists in the areas of interest.

To prevent unnecessary expense, the sophistication of prediction methods used should be kept in proportion to the scope of the EIA and the importance of the particular impact. It is often very tempting for those involved in this phase of the work to become involved in research that is of interest to themselves rather than of direct relevance to the proposal. To avoid wasting time and money the program of research and data collection must be focused on addressing the concerns outlined in the Terms of References.

Where possible, impacts should be predicted quantitatively. This makes comparison across alternatives and with baseline conditions easier. If quantification is difficult, then it is important that techniques are used that enable the impacts to be compared systematically. One technique could, for instance, take the form of a range of graded 'dot sizes' presented in a table. Sometimes, qualitative descriptions, such as of the quality of a landscape or habitat, will have to be used; however, the use of such descriptions should be minimized.

The change caused by a particular impact can be evaluated by comparing the expected future state of environmental components if the proposal were not to go ahead (the baseline condition for the no-development option) with the predicted state of those components if the proposal does proceed. Therefore, one of the first tasks involved in the detailed analysis of an impact is the collection of information that will help to describe the baseline situation at the expected time of implementation.

Although, in a theoretical sense, describing the baseline conditions should be a relatively straight-forward process, in practice there can be difficulties and expense in identifying and collecting appropriate information to undertake this task. Specialized knowledge is usually required to specify, and set appropriate limits on, the data collection required to meet the needs of any analysis and ongoing monitoring programs that may be established.

In many cases it is likely that the current baseline conditions will still exist when a project is implemented. However, some proposals, in particular very large projects, may not commence for some time or may take a long time to complete. In these cases predictions will need to be made about what the future baseline conditions will be. This will involve consideration of the following factors:

- ❑ Current status;
- ❑ Current and expected trends;
- ❑ Effects of proposals already being implemented; and
- ❑ Effects of other proposals which will be completed before implementation of the proposal under consideration.

There will be some circumstances in which the collection of data will not be possible and the EIA specialist or team will have to use their judgement to make predictions. When this occurs it should be indicated in the EIA and an explanation provided.

EIA project managers need to exercise strict control to ensure that time and effort is not spent on unnecessary baseline data collection. Remembering that the object of EIA is not specifically to describe the baseline conditions, they may also wish to impose limits on the space in the EIA report devoted to the description of the baseline situation. For example, it could be decided to limit the baseline chapter or section to not more than ten per cent of the total number of pages in the report.

Definition of Impacts

Both spatial and temporal components and can be described as the change in an environmental parameter, over a specified period and within a defined area, resulting from a particular activity compared with the situation which would have occurred had the activity not been initiated. This can be seen pictorially in Figure F.2

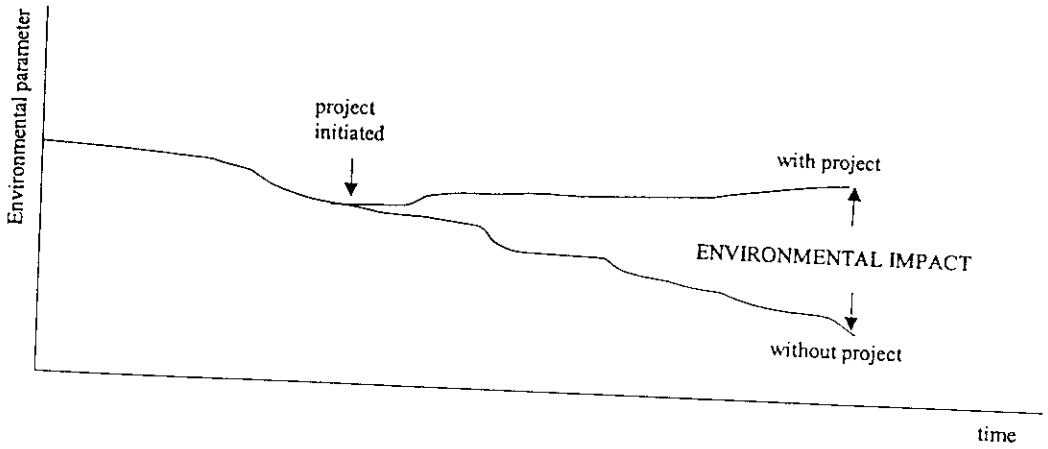


Figure F.2. Environmental impact (Wathern, 1988)

Characteristics of Impacts

When investigating the environmental impacts of a proposal it is important to note that impacts can vary in how, when and whether they will arise, and where and by how much they may affect the environment. Impacts can also interact to cause other impacts that might be more significant than the original impacts. Impacts vary in:

- Nature (positive, negative, direct, indirect, cumulative, synergistic with others);
- Magnitude;
- Extent/location (area/volume covered, distribution);
- Timing (during construction, operation, decommissioning, immediate, delayed, rate of change);
- Duration (short term, long term, intermittent, continuous);
- Reversibility/irreversibility;
- Likelihood (risk, 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, usually occurring at around the same time as the action that caused them. Typical examples of direct impacts are: loss of wetlands; destruction of ecosystems; relocation of households; increased air emissions etc. Indirect or higher-order impacts are changes that are usually less obvious, occurring later in time or in a place other than where the original impacts occurred. Examples of these types of impacts are: the spread of malaria as a result of tree removal, pesticides in the breast milk of mothers in cities due to the use of agricultural pesticides, and increased traffic volumes and urban growth due to freeway development. It should also be noted that impacts can be beneficial and that these too should be brought to the notice of decision-makers.

Magnitude

Estimating the size of the impact is of prime importance. Sometimes small impacts can be much more important than large ones. For instance, very small quantities of some toxic substances can cause large-scale health problems for humans and wildlife. Impacts can be cumulatively added to the impacts from other sources. They can also interact with impacts from other sources to create new impacts or larger impacts than those originally occurring.

Extent/location

An indication of the location, distribution and size of the area(s) to be affected should be given for each impact. This is much easier for direct impacts but should also be attempted for other types of impacts.

Timing
Impacts arising from all of the stages of the life 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 characteristics of the impacts should be noted for the decision-makers.

Duration
Some impacts may be short-term, such as the noise arising from equipment during construction. Others may be long-term, such as the inundation of land during the building of a reservoir. Impacts such as blasting may be intermittent whereas others, such as electromagnetic fields caused by power lines, may be continuous.

Reversibility
Once the cause of an environmental impact has been removed it may be that the pre-existing environmental situation may be (more or less) restored to an equivalent socially desired state. If impacts are reversible (either naturally or with human assistance) then restoration is very much easier. However, some impacts are irreversible.

Likelihood (risk)
Not all impacts share the same likelihood of occurrence. Some can be predicted to occur, more or less definitely, whereas others are less certain (but still capable of probabilistic estimation), for example the release of a toxic gas from a chemical installation. In all cases some estimate should be made of the uncertainty or 'margin of error' involved in the prediction. It is extremely difficult to describe all impacts in probabilistic terms. It is however easier, from a technical point of view, to determine the likelihood of the release of a certain amount of gas, and the consequences, than to determine the likelihood of decline in populations of birds in a wetland which may be affected by drainage changes and discharge of certain effluents. Whenever possible, attempts should be made to explain the likelihood of an impact occurring and give reasons for the judgement made. It is also important that impact assessment consider the effects of events that are low risk but high impact. Examples of these types of impacts include oil spills, failure of nuclear power plants etc.

Significance
The interpretation of significance at this stage of EIA depends on the importance of the impact for decision-making. In many cases this will be an assessment of the acceptability of the impact in terms of some existing criteria such as the permitted level of a substance or degree of change as specified in a standard, policy or plan. This concept is discussed further later in this topic.

Presentation of Impact Results
At the stage of preparing the EIA report a systematic format should be used to present information about impacts to decision-makers. One possible format is an '*Impact Characteristic Summary Table*' (Table F.2).

Table F.2. Impact characteristic summary table

Impact Characteristic	*Impact Type*		
	Air quality	*Health*	*Etc*
Nature			
Magnitude			
Extent/location			
Timing			
Duration			
Reversibility			
Likelihood (risk)			
Significance			

F.3. Environmental Indices and Indicators

Introduction

An environmental index is a numerical or descriptive categorization of a large quantity of environmental data or information, with the primary purpose being to simplify such data and information so as to make it useful to decision makers and various publics. An indicator is a single parameter or measurement that is assumed to be descriptive of the whole system. Selected indicators can also be used in impact studies.

Environmental Indicators

Indicators refer to a biological species or single measurements of factors, with the assumption being that these measurements are indicative of the biophysical or socio-economic system. Several plants, animals and microorganisms have been used as ecological indicators for many decades; they were selected for their sensitivity to various kinds of pollution or its effects. Many air-quality screening procedures sample for one indicator (CO or O_3), before undertaking a complete air quality study. This allows locations of critical air quality to be detected; these locations can later serve as monitoring points for example. Table F.3 presents a set of environmental and socio-economic indicators.

Table F.3. Preliminary set of environmental indicators (OECD, 1991, p. 9)

Biophysical Environment Indicators	
❑ CO_2 emissions	❑ Use of nitrogenous fertilizers
❑ Greenhouse gas emissions	❑ Use of forest resources
❑ SOx emissions	❑ Trade in tropical wood
❑ NOx emissions	❑ Threatened species
❑ Use of water resources	❑ Fish catches
❑ River quality	❑ Waste generation
❑ Wastewater treatment	❑ Municipal waste
❑ Land use changes	❑ Industrial accidents
❑ Protected areas	❑ Public opinion
Social and Economic Environment Indicators	
❑ Growth of economic activity	❑ Transport trends
❑ Energy intensity	❑ Private fuel consumption
❑ Energy supply	❑ Population
❑ Industrial production	

Environmental Indices

Environmental indices are used to combine several measurements, observations, or data sets into a single numerical or descriptive value for simplification purposes. Unlike environmental indicators, environmental indices require significant amount of data. They are used in EIAs/EISs to accomplish one or more of the following objectives:

- ❑ Summarize existing environmental data;
- ❑ Communicate information on the quality of the affected (baseline) environment;
- ❑ Evaluate the vulnerability or susceptibility of an environmental category to pollution;
- ❑ Focus attention on key environmental factors; or
- ❑ Serve as a basis for the expression of impact by forecasting the difference between the pertinent index with the project and the same index without the project.

While some environmental indices are fairly complicated from a mathematical perspective, it should be remembered that simple comparisons of data can be useful. For example, the following ratios yield relative indices that can be useful in an EIS:

$$\frac{\text{Existing Quality}}{\text{Environmental Quality Standard}} \qquad \frac{\text{Emission quantity or quality}}{\text{Emission standard}} \qquad \frac{\text{Existing quality}}{\text{Temporal average}}$$

In air quality studies, a very popular index is the pollutant standard index (PSI) which was developed in the USA. Ten criteria delineated in the PSI aided its promulgation. Any index should have these ten criteria and therefore should: (1) be easily understood by the public, (2) include major pollutants and be capable of including future pollutants, (3) relate to ambient air quality standards, (4) relate to air pollution episode criteria, (5) be calculated in a simple manner using reasonable assumptions, (6) be based on a reasonable scientific premise, (7) be consistent with perceived air pollution levels, (8) be spatially meaningful, (9) exhibit day-to-day variation, and (10) enable forecasting a day in advance.

The Pollutant Standard Index

Five pollutants are considered in the PSI: total (1) suspended particulates, (2) sulfur dioxide, (3) carbon monoxide, (4) oxidants and (5) nitrogen dioxide. The concentration of each pollutant is converted into a PSI value. A value of 100 is generally equivalent to the short term (< 24 hours) primary air quality standards in the USA. Hence PSI values typically range from 25 to 500. The PSI reported for a given day is the maximum of the five values obtained for different pollutants. The PSI of any pollutant with a value higher than 100 is also reported. The PSI is based on health effects of air pollution. Table F.4 is used to compute and interpret the PSI.

Table F.4. Pollutant standard index determination

PSI value	*Air quality Level*	*Health effect descriptor*	*Pollutant Level*				
			TSP (24-hr) $\mu g/m^3$	*SO_2 (24-hr) $\mu g/m^3$*	*CO (8-hr) mg/m^3*	*O_3 (1-hr) $\mu g/m^3$*	*NO_2 (1-hr) $\mu g/m^3$*
500	Significant harm	Hazardous	1000	2620	57.5	1200	3750
400	Emergency	Hazardous	875	2100	46.0	1000	3000
300	Warning	Very unhealthful	625	1600	34.0	800	2260
200	Alert	Unhealthful	375	800	17.0	400	1130
100	NAAQS[1]	Moderate	260	365	10.0	160	N/A
50	50% of NAAQS	Good	75	80	5.0	80	N/A

[1] NAAQS = National Ambient Air Quality Standard

F.4. Methods of Impact Analysis and Impact Significance

There are a number of ways in which the characteristics of impacts can be predicted. These include (UN ESCAP, 1990):

- Professional judgement;
- Quantitative mathematical models;
- Experiments, physical models; and
- Case studies.

Professional judgement

It is important to note that all methods of analysis involve some degree of professional judgement. The sole reliance on professional judgment can be unavoidable when there is a lack of data to support more rigorous analyses or there is a lack of analytical techniques with which to make the predictions (such as in the analysis of many social impacts). Examples of the use of professional judgement include:

- A sociologist basing the prediction of the effect that a water supply proposal may have on the nature of women's work in the community; and
- An anthropologist using a workshop approach to assess the cultural significance of a communal place.

Specialist practitioners engaged for this type of analysis should be very experienced in their field, the type of proposal, the geographic region and in EIA. Where professional judgement is used without also employing other more objective methods, the EIA manager should be aware that the judgement and values of the specialist concerned may influence the outcome.

Quantitative mathematical models

Quantitative models are mathematical expressions developed to simulate some aspect of reality. Once they have been developed it is usually not difficult to make changes in the input conditions for the model and then to see how the outputs are affected. For instance, differences in air pollution can be calculated by changing, within the model, the height of a chimney stack or the rate of output of emissions.

When interpreting the output from quantitative mathematical models it should be remembered that all models are simplifications of the real world and 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. Examples of the use of quantitative models include:

- Air dispersion models to predict rates and concentrations at various points; and
- Hydrological modeling to predict changes in the flow regime of rivers.

Traditionally, this type of analysis has been carried out for physical impacts. Increasingly, however, mathematical models are being developed to analyze biological, social/demographic and economic impacts.

Experiments and physical models

Experiments and physical modeling can be used to test and analyze the effects of project-like activities as well as the effectiveness of proposed mitigation techniques. Experiments can be done directly in the field or under laboratory conditions depending upon the nature of the impact and the resources available. Physical models can be built to predict the behavior and effect of the actual project on the environment. A typical example of this would be using a physical model to assess the changes to sand movements resulting from port and marine projects. It must always be remembered when using the results of experiments or models that unpredicted outcomes can occur when experimental data is 'scaled up' to life size. Examples of the use of experiments include:

- The exposure of fish in a laboratory to pollutants to determine rates of uptake and retention; and
- Field trials of the effectiveness of different methods of erosion control.

Case studies

Reviewing case studies of similar proposals in similar environments can provide a good basis for confirming the direction and findings of impact assessment.

Sensitivity Analysis

Because the relationship between impacts and effects may not be linear it can be found that small changes in impacts may cause larger than expected increases or decreases in the resulting magnitude of the environmental effects. 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 severity of the environmental effects, particularly if the magnitude of the impacts was uncertain to begin with. This is referred to as a sensitivity analysis.

Non-Biophysical Impacts

Whilst there is considerable experience in analyzing many of the biophysical impacts there is still a lack of confidence in dealing with the broader range of impacts that are now typically integrated into an EIA. The discussion below of social, health and economic impacts serves as a brief introduction to some of these other impacts.

Social Impact Assessment

The close relationships between social and environmental systems make it imperative that social impacts are identified, predicted and evaluated in conjunction with biophysical impacts during an EIA. People and their social groups are a component part of their environment and environmental changes are often linked to social change (and vice versa).

Social impacts include changes that affect individuals, institutions, communities and larger social systems as well as the interactions between them. In basic terms they are alterations in the way people live, work, play, relate to each other and organize to meet their needs as well as changes in the values, beliefs and norms that characterize their 'group' and guide their individual and collective actions. Social impacts can be divided into three main types:

- *Demographic impacts* such as changes in population numbers, population 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 resource impacts* including changes in archaeological, historical and cultural artifacts and structures and environmental features with religious or ritual significance; and
- *Socio-cultural impacts* including changes in social structures, social organizations, social relationships and accompanying cultural and value systems (language, dress, religious beliefs and rituals).

The assessment of social impacts involves the collection and analysis of demographic and socio-cultural data. Much of these data will be identified or generated during the public involvement program for the EIA. It is therefore best if specialist social scientists both undertake the public involvement program and analyze the social impacts. To maximize the potential for integration of social and biophysical impacts throughout the EIA the social scientists should be engaged at an early stage in the EIA and be an integral part of the EIA team.

Health Impacts

Although development projects usually result in considerable benefits to people there are sometimes hidden and uncomputed costs associated with health and safety (Asian Development Bank, 1992) (Figure F.3). These costs can reduce the overall profitability of the development. When environmental impact assessment includes the consideration of health impacts the potential health-related effects of development can be predicted, mitigated and managed far more cost effectively than if they are left to emerge after project implementation. Health impacts can result directly from changes to the biophysical environment (such as exposure to toxic pollutants) or indirectly as the result of other changes caused by the project (e.g. lowered socio-economic status resulting in increased morbidity and mortality). The implementation of proposals can also increase the risk of accidents and disasters

	Communicable disease	*Non-Communicable disease*	*Nutrition*	*Injury*
Transport	2			□
Mining		Ž		◆
Energy		□		
Natural Resources	□		□□	
Public Services	□□			
Manufacture and Trade		□		□

2	Brazil, 1970s - Half the malaria cases in Amazonia were linked to the narrow area of influence of the Transamazon Highway. Uganda, 1986 - Along the main link road to Kenya, 32% of the truck drivers and 68% of the women working in bars were HIV positive.
□	Papua New Guinea, 1980s - Traffic accidents were estimated to cost 1% of GNP.
Ž	South Africa, 1980s - Many miners suffered from permanent dust induced lung damage. This activates latent tuberculosis. Infection rates were 800-1000 per 100,000.
◆	Bolivia, 1970s - The population of 24,000 mineworkers in large mines had 5,430 injuries.
□	Household cooking on open fires may be the largest single occupational health problem of women. It leads to many respiratory and eye diseases.
□	Sri Lanka, 1986 - A rice development project created breeding sites for mosquitoes which transmit Japanese encephalitis. Pigs near the rice fields provided the virus. The result was an epidemic.
□	Sri Lanka 1970s - On some tea estates child labour was common, education facilities minimal and water supplies inadequate. Chronic malnutrition and infant mortality rates were twice the rural average. Kenya, 1980s - Participants in a dairy development project sold the available milk for cash. They did not reserve enough milk to feed their children.
□□	Burma, 1950s - Satellite towns built on swampy land became waterlogged during the rains. Mosquito breeding increased. Filariasis was transmitted.
□	Cubato, Brazil, 1980s - There were 23 major industrial plants and many small operations. A high rate of respiratory disorders was associated with high levels of water and air pollution. Neonatal mortality and birth deformities increased.
□	In developing countries, the annual rate of accidents causing disabling injuries to workers is 21-34%, compared to 3% in the UK.

Source: Birley, M. – Liverpool School of Tropical Medicine

Figure F.3. Health impacts

Economic and Fiscal Impacts

Economic impact assessment is carried out to predict changes in employment, per capita income and levels of business activity resulting from a proposal. Economic impacts are often a major cause of social impacts. Fiscal impacts are the changes in the costs and revenues of the various government sectors. These changes typically occur as the result of the proposal causing large increases in population and the consequent demand that this can place on the community infrastructure provided by government e.g. health services, roads, sewerage etc.

As with other impacts, appropriate baseline data needs to be collected to describe the baseline economic and fiscal situations (without the proposal) and then prediction techniques are required to describe the changes occurring if the proposal is implemented. Specialized prediction techniques are available to model both economic and fiscal changes (e.g. input-output models (I-O) for economic changes). The factors that typically affect economic and fiscal impacts are outlined below.

Factors affecting economic impacts

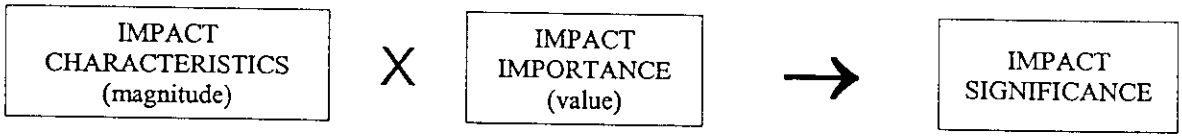
- Duration of construction and operational periods;
- Workforce requirements for each period and phase of construction including numbers to be employed during the peak phase for construction works;
- Skill requirements (local availability);
- Earning;
- Raw material and other input purchases;
- Capital investment;
- Outputs; and
- 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; and
- Likely demographic changes arising from project requirements (these need to be estimated during the assessment of social impacts).

Impact Significance

Once the impacts have been analyzed, it is important to determine their significance, that is, whether they are acceptable, require mitigation, or are unacceptable to the community. Note that care should be taken to ensure that the assessment of significance is not confused with making the decision about the future of the proposal. This latter task is the role of the decision-maker who can use the significance information in the decision-making process. The significance of an impact is determined by the joint consideration of the impact characteristics and the importance (or value) attached to them.



Determining the importance of the various issues can sometimes be approached by comparing the likely or predicted impacts with current standards. If the proposal, including the adopted mitigating measures, does not cause the standard to be exceeded, the issue might be considered to have been adequately addressed. If the anticipated impact is well below the standard, it might be that the issue needs no further consideration. (It should be noted that just because an impact is large does not mean that it is significant, and vice versa.)

However, reliance on standards suffers from two deficiencies - there may be no appropriate technical standard (e.g. social impacts, visual impacts, clearing of vegetation) and there may be no community confidence in or agreement on the standards that have been established (e.g. blood lead levels, traffic noise levels, electromagnetic field strengths).

Another approach is to consider sustainable development criteria, such as the preservation of genetic diversity, the wise use of resources, and consideration of the welfare of future generations. A difficulty with this approach is the lack of sufficient environmental data to enable such analysis to be pursued. A list of the types of evaluation criteria that could be used (or adapted) as the starting point for developing a set of specific sustainability criteria are presented in Table F.5.

Table F.5. Sustainability evaluation criteria (Fleming and Daniell, 1995)

- ❑ Maintenance of habitat and ecosystems
- ❑ Preservation of native plant species
- ❑ Preservation of native animal species
- ❑ Preservation of areas of landscape/ amenity value
- ❑ Preservation of areas of cultural value
- ❑ Reclamation and reuse of wastewater
- ❑ Wastewater disposal within assimilative capacity
- ❑ Groundwater extraction within sustainable yield
- ❑ Improvement in surface water quality
- ❑ Improvement in groundwater quality
- ❑ Productive use of fertile soils
- ❑ Prevention of erosion
- ❑ Application of clean technology
- ❑ Waste recycling or use
- ❑ Material utilization allowing recycling or reuse
- ❑ Increased use of metal substitutes
- ❑ Capital cost funding capability
- ❑ Compatibility with existing operations or services
- ❑ Local infrastructure compatibility
- ❑ Minimization of greenhouse gas emission
- ❑ Airborne disposal within assimilative capacity
- ❑ Use of renewable energy sources
- ❑ Energy efficiency
- ❑ Public acceptability
- ❑ Involvement of the community
- ❑ Improved recreational opportunities
- ❑ Improved access to public open spaces
- ❑ Full cost recovery for good or service
- ❑ Annual equivalent cost-benefit ratio
- ❑ Costs borne by consumers
- ❑ Equitable cost-benefit distribution
- ❑ Increase in employment opportunities
- ❑ Unit cost for good or service

Ultimately, the significance of issues and their relative importance is subjective. Even the apparently scientific establishment of environmental discharge standards will have involved the balancing of environmental quality and economic reality. Significance must be derived from community preferences and can be discovered through public involvement or other specialized methods. The approach used to determine significance must take into account the social and cultural aspects of local value systems and traditional practices. Some of the impact identification techniques have built-in scales or weightings (and hence values) establishing the importance of parameters based on prior experience. In most cases the individual specialist or the EIA team will be required to identify or establish a set of justifiable significance criteria by which the impacts can be evaluated. A range of significance criteria under are outlined below under four categories (Sader, 1995):

Ecological importance

- ❑ Effect on plant and animal habitat;
- ❑ Rare and endangered species;
- ❑ Ecosystem resilience, sensitivity, biodiversity and carrying capacity; and
- ❑ Viability of local species population.

Social importance

- ❑ Effects on human health and safety;
- ❑ Potential loss of species with current or potential value, or commercially available production (farmland);
- ❑ Recreational or aesthetic value;
- ❑ Demands on public resources such as social services;
- ❑ Demands on transportation and other infrastructure; and
- ❑ Demographic effects.

Environmental standards

- ❑ Limits on effluent discharge concentrations;
- ❑ Clean air and water quality standards, policies or plans; and
- ❑ Plans or policies that protect areas or limit the use of natural resources.

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Assessment Matrix (Leopold Matrix): Transportation

(UNEP, EIA Training Manual, 1996)

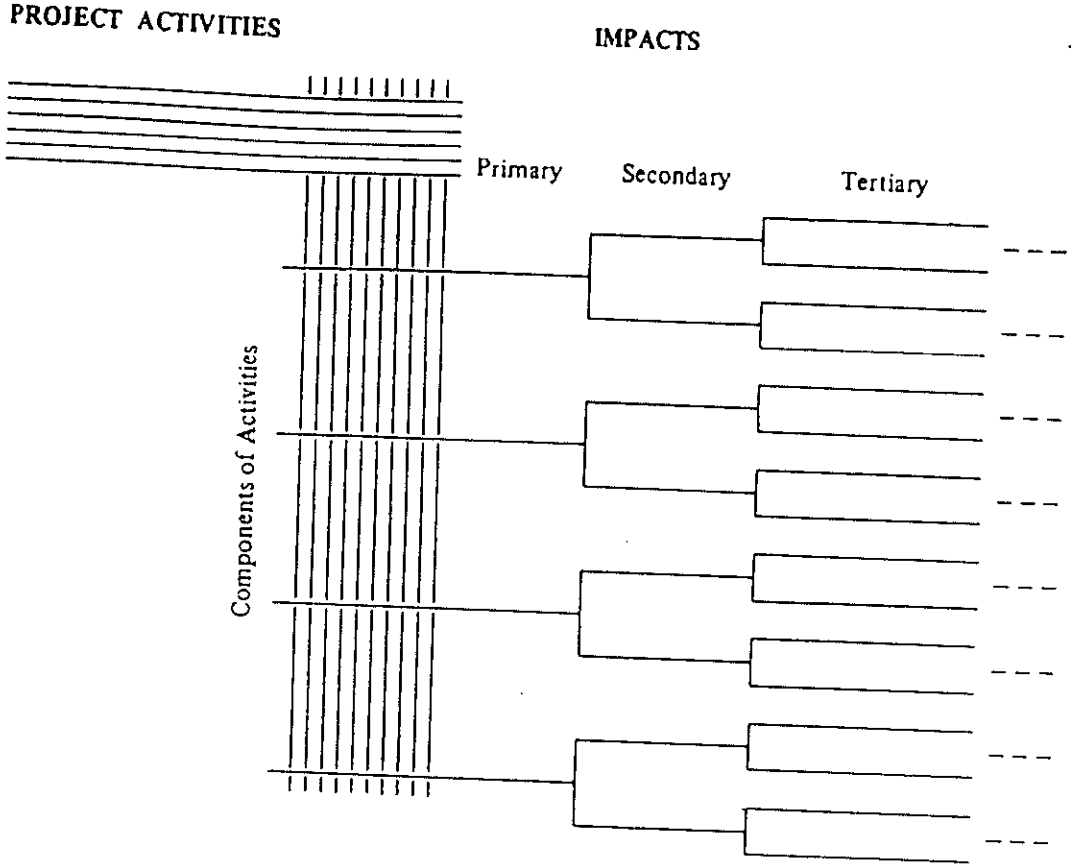
	Environmental Effects / Development	Transport – People - Road - Rail - Air - Water	Transport – Materials - Road - Rail - Air - Water - Pipelines	Energy supply – Transport to Site - Electricity - Gas - Oil - Other	Water Supply - Source - Transport Water Disposal - Liquid - Solid Communications Housing - Temporary - Permanent
BIOLOGICAL	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				
	Sedimentaion				
	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				

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.

HANDOUT F-2

Example of a Simple Impact Identification Network



HANDOUT F-3

Environmental Parameters Checklist for Projects in Roads and Highways

(Adapted from UN ESCAP, 1990)

Actions Affecting Environmental Resources/Values (A)	Damage to Environment (B)	Recommended Feasible Protection Measures (C)	Initial Environmental Evaluation (D) (Check appropriate bares)			
			No Significant Effects (D1)	Probable Significant Effects		
				Small (D2)	Moderate (D3)	Major (D4)
(a) Environmental Problems for Major Highways/ Roads Rehabilitation Projects						
(i) Does review of experience with existing project indicate ally significant environmental protection problems? If so, list and grade time.	(i) Depends on types of adverse effects	(i) Depends an types of adverse effects				
(ii) Construction stage (non project)	(ii)					
(1) Hazards of silt runoff during construction	(1) Impairment of downstream water quality and land values	(1) Competent system for control of silt runoff during construction				
(2) Hazards of continuing silt runoff from areas not properly resurfaced	(2) Impairment of water quality/land values/ aesthetics	(2) Proper resurfacing or replanting				
(3) Other construction hazards	(3) As applicable	(3) As applicable				
(4) Provision of appropriate construction monitoring	(4) Without monitoring contractor not likely to comply with constraints	(4) Competent construction state monitoring				
(iii) Post-construction operations monitoring	(iii) Without monitoring cannot assess adequacy of project design / O&M	(iii) Competent post- construction monitoring				
(b) Environmental Problems for Major New Highway Project						
(i) Encroachment on precious ecology	(i) Loss of precious ecology	(i) Careful planning to minimize and offset losses				
(ii) Encroachment on historical/cultural monument area	(ii) Loss of these values					
(iii) Impairment of fisheries/aquatic biology, and of other beneficial uses	(iii) Impairment of downstream beneficial water uses					
(iv) Erosion, and siltation	(iv) Excessive soil erosion and impairment of downstream water quality	(iv) Careful resurfacing or replanting of exposed areas				
(v) Environmental aesthetics	(v) Loss of scenic values	(v) Careful planning to minimize and offset losses				
(vi) Noise and vibration	(vi) Nuisances to travelers and neighbors	(vi) Careful Planning to minimize and offset losses				
(vii) Air pollution hazards	(vii) Nuisances and health hazards to travelers/workers	(vii) Control of motor vehicle missions				
(viii) Highway runoff pollution						
(ix) Highway spills of hazardous materials	(ix) Serious health/safety hazards to travelers and neighbors	(ix) Careful planning and O & M and competent emergency cleanup				
(x) Construction stage problems	(x)	(x)				
(1) Erwin and silt runoff	(1) Impairment of downstream water quality and land values	(1) Careful construction planning including use of ponds				

Actions Affecting Environmental Resources/Values (A)	Damage to Environment (B)	Recommended Feasible Protection Measures (C)	Initial Environmental Evaluation (D) (Check appropriate bares)			
			No Significant Effects (D1)	Probable Significant Effects		
				Small (D2)	Moderate (D3)	Major (D4)
(2) Other construction hazards (3) Monitoring (xi) Post-construction monitoring	(2) As applicable (3) Needed to ensure contractor compliance with constraints (xi) Needed to ensure adequacy to project design/O&M	(2) As applicable (3) Competent construction stage monitoring (xi) Competent post-construction monitoring program				
(c) Environmental Problems for Rural Roads						
(i) Encroachment Into precious ecology	(i) Same as (b)(i) above	(l) Same as (b) (i) above				
(ii) Encroachment into historic/cultural values	(ii) Same as (b) (ii) above	(it) Same as (b) (ii) above				
(iii) Imminent of fisheries or other beneficial water uses	(iii) Same as (b) (iii) above	(iii) Same as (b) (iii) above				
(iv) Erosion and silt runoff	(iv) Same as (b) (iv) above	(iv) Same as (b) (iv) above				
(v) Dust nuisances	(v) Disturbances to people/properties near road	(v) Careful design				
(vi) Construction stage problems	(vi) Same as (b) (ix) above	(vi) Same as (b) (ix) above				
(vii) Post-construction monitoring	(vii) Same as (b) (x) above	(vii) Same as (b) (x) above				

HANDOUT F-4

Impact Identification Checklist for Transport Projects

(Commission of the European Communities, Directorate-General for Development, 1993)

Aspects of EIA	Checklist Questions Will the project	Yes	No	Additional data needs
Sources of Impacts	1. Require large volumes of construction materials to be taken from local sources (e.g. gravel, rock, water by dredging, quarrying, tapping etc.)?	☐	☐	☐
	2. Result in significant quantities of wastes or eroded material (dependent upon waste type, season of heavy rainfall)?	☐	☐	☐
	3. Require significant levels of accommodation or service amenities to support the workforce during construction (e.g. > 100 manual workers)?	☐	☐	☐
Receptors of Impacts	4. Be routed such that population resettlement or compensation is required?	☐	☐	☐
	5. Be routed through areas that support conservation-worthy ecosystems, flora or fauna (e.g. protected areas, wilderness areas, wetlands, tropical forest, critical habitats, endangered species); or sites of historical or cultural importance?	☐	☐	☐
	6. Be routed across major drainage channels (rivers, canals) or surface water-bodies (lakes, lagoons)?	☐	☐	☐
Environmental Impacts	7. During construction, lead to reductions in the quality of potable water supplies or cause harm to fish and benthic communities, due to the siltation of water-bodies?	☐	☐	☐
	8. Present a danger to local populations due to a significant scale of traffic, (e.g. heavy lorries, high frequency, transport at night?	☐	☐	☐
	9. Create barriers to the movement of conservation-worthy wildlife or livestock?	☐	☐	☐
	10. Lead to a significant increase in congestion and related smog and noise?	☐	☐	☐
	11. Present a pollution risk to potable water supplies, or to surface water bodies that support conservation-worthy or commercially significant fish, due to accidents during the transport of hazardous materials?	☐	☐	☐
	12. Lead to unplanned settlement or access to conservation worthy ecosystems or natural resources (e.g. agricultural land, timber, minerals, squatter settlements)?	☐	☐	☐
Mitigation Measures	13. Be likely to require mitigation measures that result in the project being financially or socially unacceptable?	☐	☐	☐
Comments				
	I recommend that the program be assigned to Category Signature: Delegation ..... Desk.....	☐		

HANDOUT F-5

Methods for impact prediction of highway/roads development projects

(UN ESCAP, 1990)

Proposed components	*Methods or models for impact prediction and assessment*
Physical parameters	
Hydrology:	
Groundwater	❑ Field survey, well observation
Drainage pattern	❑ Field survey
	❑ Turbidity
	❑ Sampling and analysis (Jackson's unit)
Toxic compounds	❑ Sampling and analysis (Bioessay)
Oil and grease, others	❑ Sampling and analysis depending upon the receiving water
Physical resources	
Geology:	
Geology and mineral	❑ Geological formation
Soil	❑ Photograph interpretation
	❑ (Field survey)
	❑ (Soil mapping)
Erosion and sedimentation	❑ Not any proposed
Seismology	❑ Seismological instrument
Air quality:	
CO	❑ Highway line source diffusion models
	❑ The Pennsylvania Dept. of Transportation's Air Quality Screening Process (AQSP)
SO_2	❑ Non dispensive infrared spectrometry
	❑ Pararosaniline Method-Technicon I
NO_2	❑ Pararosaniline Method-Technicon II
	❑ Sodium Arsenite
	❑ Sodium Arsenite/Technicon
Pb	❑ TGS-ANSA method
HC	❑ High volume sampler
Particulate:	❑ Flame ionization
	❑ High volume methods
Noise:	❑ L50
	❑ Leq
	❑ Highway traffic noise prediction model (FHWA TNM)
Vibration:	❑ Field measurement of Peak Particle Velocity (mm/sec) and time (millisecond)
Meteorology:	
Rainfall	❑ Arithmetic average
Temperature	❑ Direct measurement
Wind	❑ Windrose
Humidity	❑ Direct measurement
Ecological resources	
Terrestrial Flora and Fauna:	
Swamp ecology	❑ Field survey
Flora	❑ Abundance scale sample plots (quadrants)
	❑ Transects, line-intercepts, plotless sampling
	❑ Species diversity
Fauna	❑ Direct observation census data sample plots
	❑ Count indices mark-recapture method
Rare \ endangered species	❑ Red data book

Proposed components	*Methods or models for impact prediction and assessment*
Human use resources:	
Land use	❑ Land use maps, field checks
Land transport	❑ Road network mapping tabulation
Agriculture	❑ Census or survey
Flood control	❑ Flood frequency and damage analysis
Job and employment	❑ Questionnaire and simple summation
Traffic hazards	❑ Volume/capacity ratio (V/C)
Population and household	❑ Census calculation, questionnaire
Resettlement	❑ Item-by-item
Compensation	❑ Fair compensation (land) market value (structures) volume estimation (tree)
Quality of life values:	
Solid waste management/Sanitation	❑ Environmental rating
Social effects	❑ Field surveys, questionnaires
Archaeological values	❑ Highway mapping routes, literature research, visual survey, social reaction
Aesthetics	❑ Visual analysis
Safety	❑ Computation of volume/capacity ratio, highway design human flow habitat density on sides of highway, assess to health center
Public health	❑ Consultation with concerned authorities, literature research economy and nutrition, field survey

G. Impact Mitigation: Analysis of Alternatives, Environmental Management, Monitoring

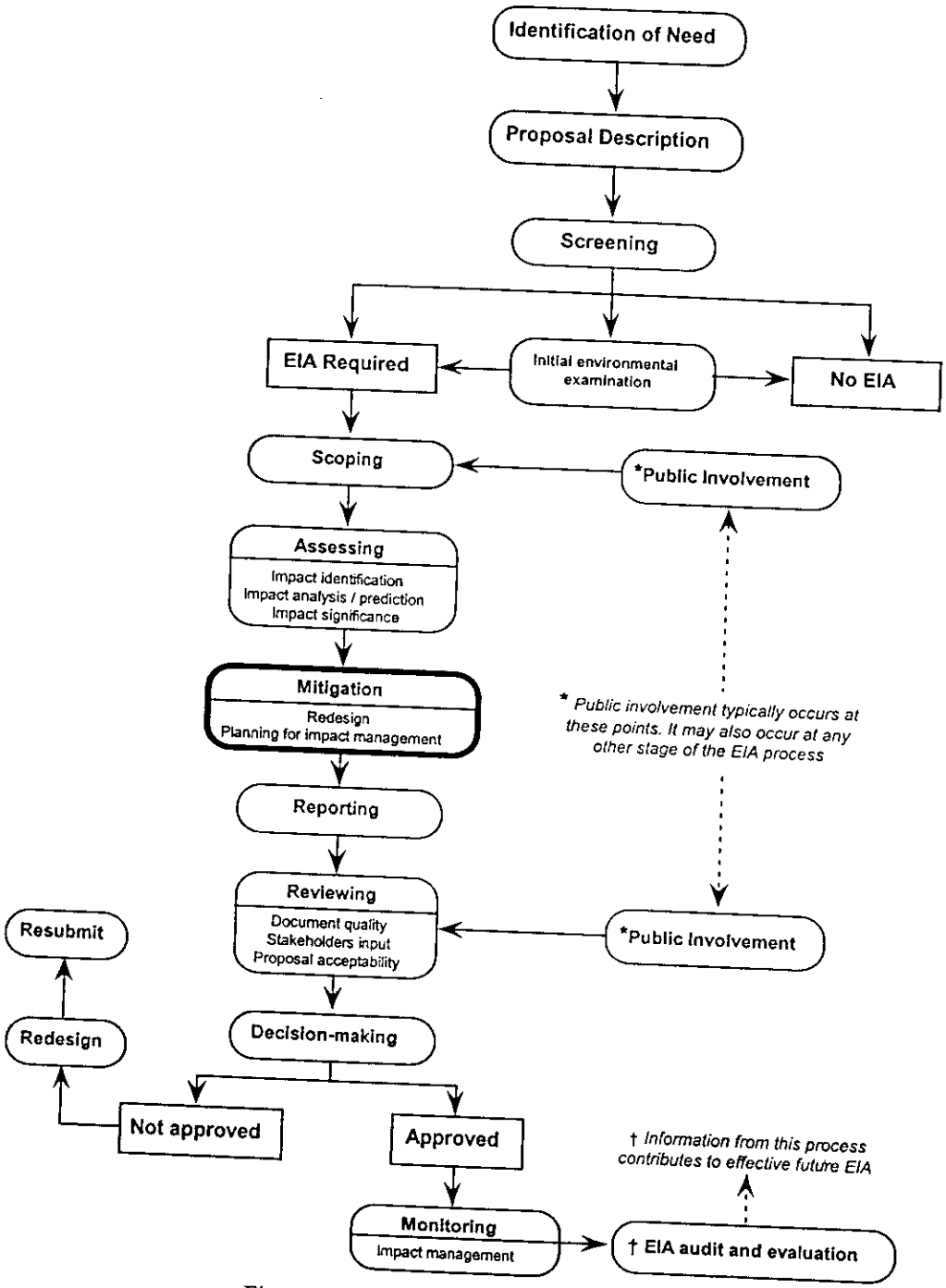


Figure G.1. Mitigation in the EIA process

G.1. Environmental Management

Introduction

One of the main tasks of impact assessment is to predict and prevent unacceptable adverse effects through the implementation of appropriate project modifications (mitigation). In order for this process to be cost effective, it is necessary that the impact assessment be carried out at the same time as the project design and that early links are established between those doing the impact assessment and those designing the project. Mitigation of impacts seeks to:

- ❑ Find better ways of doing things;
- ❑ Minimize or eliminate negative impacts;
- ❑ Enhance the benefits of a proposal; and
- ❑ Protect public and individual rights to compensation.

Successful impact management requires that mitigation measures are implemented at the correct time and in the correct way. This usually requires a clearly written and agreed plan of action.

Proponent's Responsibility

The adverse consequences of projects can be felt far beyond the boundaries of the project site. In the past, many of the true costs of projects were not acknowledged or accounted for in the economic analyses of a project's worth, particularly in the operational and decommissioning phases of the project's life. Therefore, these costs were often borne by the community rather than by the proponent. With the move towards sustainability there is now recognition that the proponent has a responsibility to 'internalize' the costs felt beyond the project boundaries and incurred over the life of the project. This has encouraged governments and agencies to require proponents to:

- ❑ Avoid or minimize impacts through good design or design modifications (mitigation); and
- ❑ Produce plans for managing impacts so that these are kept within the limits of acceptability.

While it has been argued that internalizing the costs would lead to an increase in the cost of projects, this has not always been the case and many proponents have found that good design and management have actually resulted in significant savings. This outcome is similar to that found in industries applying the principles of cleaner production to improve their environmental performance. In many cases alternative production methods, although more costly in the short term, have been found to be cheaper or more effective in the long run. For instance, introducing measures to clean up effluent streams has been the catalyst for the implementation of recycling and recovery operations, with marketable by-products providing a cost return (OECD, 1992).

Questions Asked

Effective mitigation requires a proper understanding of the problem. The following are pertinent questions:

What?
- ❑ Is the problem associated with public health, ecological risks, environmental amenity or resource depletion?
- ❑ Is the problem linked to specific emissions from known sources or from non-point sources of pollution?
- ❑ Are the sources of pollution homogeneous or are there many different kinds of sources? Are they concentrated or geographically dispersed?
- ❑ Are pollution reduction costs similar for all sources?
- ❑ Does the problem require a public response or can it be decided by stakeholders if there is some forum where they can negotiate?
- ❑ Is the problem associated with public health, ecological risks, environmental amenity or resource

When?
- ❑ Is the problem immediate? Does it constitute a clear and present danger, is it impending or perhaps speculative?
- ❑ Is it possible to reduce or delay the problem by taking partial steps now or is full action required immediately?
- ❑ What are the costs and risks of waiting for additional information?

Where?
- ❑ Should the problem be addressed at the local, regional, national or international level?
- ❑ Does the scope of the problem determine the level of institutional overlap or centralization required? If not, why not?

How?
- ❑ Are the pathways by which the perceived environmental problem generates people-level impacts understood?
- ❑ Are victims able to avert, minimize or mitigate impacts and are there incentives for them to do so?

Who?
- ❑ Which stakeholders stand to gain or lose?
- ❑ Are there possibilities to mitigate special hardships, perhaps by offering subsidies to offset costs?

(Adapted from OECD, 1992)

Mitigation Options

When significant impacts are identified in the construction, operational or decommissioning phases of a project, collaboration is required between the project designers and the EIA team to see if design changes can mitigate these problems (Handout G-1 and Handout G-2). Depending on the nature of the impacts and the timing in the design cycle there are a number of different ways in which problems can be managed including:

- ❑ Developing alternative ways of meeting the need;
- ❑ Making changes to planning and design;
- ❑ Improving monitoring and management practices;
- ❑ Compensating in monetary terms; and
- ❑ Replacing, relocating, rehabilitating.

Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)

Impact Management Plans

An EIA report contains a number of predictions about the environmental impacts of proposals and recommendations for their mitigation and management. Project approval is also often made conditional upon the proponent complying with a further set of requirements. In order to successfully monitor and manage the impacts and to implement the mitigation measures at the appropriate time, the proponent requires a clear plan of action. Depending upon the requirements of the EIA system, this plan of action may be included in, or appended to, the EIA report. It is often referred to as an impact management plan. An impact management plan should (Handout G-3).

- ❑ Contain a statement of the proponent's environmental policy including compliance of the project with any legislation or standards;
- ❑ Designate a person to be responsible for the overall implementation of the plan;
- ❑ Include a schedule of tasks to be undertaken to comply with the recommendations of the eia report and the requirements of the approval. This schedule should include any required training of staff;
- ❑ Allocate responsibility for carrying out the tasks;
- ❑ Include a system of reporting on the progress of the tasks (and budget);
- ❑ Include a system for the monitoring and auditing of the plan's achievements in environmental protection/enhancement; and
- ❑ Contain a contingency plan of actions to be taken when monitoring results indicate that impacts are not in accordance with predictions or required standards.

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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Further Reading

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Potential Impacts and Mitigation Measures for Road and Highway Projects

(World Bank, 1991)

Potential negative impact	Mitigation measures
Direct	
1. Increased sediment in streams affected by erosion at construction sites and fresh road cuts, sills and waste dumps.	1. ❑ Protect susceptible surfaces with mulch or fabric, and plant erodible surfaces as soon as possible
2. Soil and water contamination by oil grease, fuel and paint in equipment yards and asphalt plants.	2. ❑ Collect and recycle lubricants. ❑ Avoid accidental spills through good practice.
3. Air pollution from asphalt plants.	3. ❑ Install and operate air pollution equipment.
4. Local dust and noise.	4. ❑ 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 transversed by the highway, notably metropolitan areas or densely settled rural areas.	5. ❑ Include physical barriers to noise 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.	6. ❑ Use an architectural design to blend with the landscape. ❑ Replant disfigured surfaces.
7. Landslides, slumps, slips and other mass movements in road cuts.	7. ❑ 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 roadbed receiving concentrated outflow carried by covered or open drains.	8. ❑ Increase in number of drain outlets. ❑ Drain outlets placed so as to avoid cascade effect. ❑ Lining of receiving surface with stones, concrete.
9. Roadside litter.	9. ❑ Provide for disposal facilities ❑ Encourage anti-littering laws and regulations.
10. Hazardous driving conditions where construction interferes with preexisting roads.	10. ❑ 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).	11. ❑ Installation of adequate drainage works.
12. Destruction of vegetation and wildlife in the right-of-way occupied by the highway.	12. ❑ Realignment where possible to detour exceptional areas, identified by prior surveys.

Potential negative impact	Mitigation measures
13. Destruction or damage of terrestrial wildlife habitats, biological resources or ecosystems that should be preserved.	13. ❑ Plan national transportation route alignment according to location of fragile, unique, etc., areas.
14. Alteration of hydrological regimes of wetlands by causeways, with harmful effects on these ecosystems	14. ❑ Realignment to avoid wetlands ❑ Installation of culverts, bridges, etc., as needed and according to criteria from prior hydrobiological surveys. ❑ Artificial construction of wetlands to replace areas lost (where experience has shown that the wetland type in question can, in fact, be constructed). ❑ Include local NGOs in the institutional arrangements for wetlands conservation. ❑ Promoting development of national wetland incentives and management strategies. ❑ Environmental education programs to disseminate knowledge on importance of wetlands.
15. Interruption of migratory routes for wildlife and livestock Increased collision with animals	15. ❑ realignment to avid important migratory routes ❑ provide undergrade crossings
16. Poor sanitation and solid waste disposal in construction camps and work sites.	16. ❑ Provide adequately located and maintained latrines.
17. Possible transmission of communicable diseases from workers to local populations and vice versa.	17. ❑ 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.	18. ❑ Assess vector ecology in work areas and take steps where possible to avoid creating habitats.
19. Creation of a transmission corridor for disease, pests, weeds and other undesirable organisms.	19. ❑ Set up plant and animal sanitation services and related checkpoints.
20. Poaching by construction workers.	20. ❑ Prohibit poaching under terms of employment.
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	21. ❑ 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.	22. ❑ Include appropriately designed and located crossings.
23. Impairment of non-motorized transportation in the highway corridor due to reduced or impeded right-of way.	23. ❑ Include slow traffic lanes and/or paved shoulders and safe crossings.
24. Accident risks associated with vehicular traffic and transport, that may result in spills of toxic materials injuries or loss of life.	24. ❑ Design and implement safety measures and an emergency plan to contain damages from accidental spills. ❑ Design special route for hazardous materials transport.

Potential negative impact		Mitigation measures
Indirect		
25. Induced development: roadside commercial, industrial ,residential and "urban sprawl	25. ❑	Involve land use planning agencies at all levels ion project design and EA and plan for controlled development
26. Increased motorized transportation (with possible increased dependency on imported fuels	26. ❑	Include project components to encourage use of non-motorized modes of transportation
27. Impairment of non-motorized transportation economy due to changes in land use and/or availability of motorized alternative	27. ❑	Include project components to stimulate local production and use of non-motorized modes of transportation
28. Unplanned or illegal timber cutting.	28. ❑	Involve local leaders in protection to avoid illegal harvesting.
	❑	Establish clear, long-term jurisdiction over the forest emphasizing local involvement in decision making.
29. Unplanned or illegal land clearing.	29. ❑	Involve local leaders in protection

HANDOUT G-2

Potential Impacts and Mitigation Measures for Rural Roads Projects
(World Bank, 1991)

Potential negative impact	Mitigation measures
Direct: during construction	
1. Erosion from fresh road cuts and fills and temporary sedimentation of natural drainage way.	1. ❑ Limitation of earth moving to dry periods.. ❑ Protection of most susceptible soil surfaces with mulch. ❑ Protection of drainage channels with brems, straw or fabric barriers. ❑ Installation of sedimentation basins, seeding or planting of erodible surfaces as soon as possible
2. Ground and water contamination by oil, grease, and fuel in equipment yards.	2. ❑ Collection and recycling of lubricants. ❑ Precautions to avoid accidental spills
3. Creation of stagnant water bodies in borrow pits, quarries, etc. suited to mosquito breeding and other disease vectors.	3. ❑ Assessment of vector ecology in work areas and employment of measures (e.g. improved landscaping, filing or drainage) to avoid creating habitats.
4. Environmental and social disruption by construction.	4. ❑ Careful sitting, construction and management of construction camps
Direct: Permanent	
5. Destruction of buildings, vegetation and soil on the right-of-way, borrow pit sites, waste dumps and equipment yards.	5. ❑ Alternative alignments. ❑ Harvest and utilization of public domain forest resources prior to construction
6. Interruption of subsoil and overland drainage patterns (in areas of cuts and fills).	6. ❑ Installation of adequate drainage works
7. Landslides, slumps, slips and other mass movements in road cuts.	7. ❑ Route alignment to avoid inherently unstable areas. ❑ Design of drainage works to minimize change in surface flows and adequate to local conditions, according to prior surveys. ❑ Stabilization of road cuts with structures (concrete walls, dry wall masonry, etc.).
8. Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains.	8. ❑ Increase in number of drain outlets. ❑ Drain outlets placed so as to avoid cascade effect. ❑ Lining of receiving surface with stones, concrete.
9. Increased suspended sediment in streams affected by road cut erosion, decline in water quality and increased sedimentation downstream.	9. ❑ Establishment of vegetative cover on erodible surface as soon as possible. ❑ Establishment of retention ponds to reduce sediment load before water enters stream.

Potential negative impact	Mitigation measures
10. Marred landscape (scars from road cuts, induced landslides and slumps, etc.).	10. ❑ Tourist site access roads planned with regard for visual aesthetics.. ❑ Grade limitations to avoid cutting and filling where scenery would be spoiled. ❑ Maintenance and/or restoration of roadside vegetation.
11. Health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles.	11. ❑ Dust control by application of water or chemicals.
12. Contamination of ground and surface waters by herbicide for vegetation control and chemicals (e.g. calcium chloride) for dust control.	12. ❑ Reduce use. ❑ Alternative (non-chemical) methods of control.
13. Accidental risks associated with vehicular traffic and transport, that may result in spills of toxic material, injuries or loss of life.	13. ❑ Regulation of transport of toxic materials to minimize dangers. ❑ Prohibition of toxic waste transport through ecologically sensitive areas.
14. Creation of a new pathway for disease vectors affection humans and animals.	14. ❑ Establishment of plant and animal sanitation services and related checkpoints
15. Disruption/destruction of wildlife through interruption of migratory routs, disturbance of wildlife habitat and noise related problems.	15. ❑ Siting to minimize impacts.
Indirect	
16. Unplanned or illegal timber cutting.	16. ❑ Involve local leaders in protection to avoid illegal harvesting. ❑ Establish clear, long-term jurisdiction over the forest emphasizing local involvement in decision making.
17. Unplanned or illegal land clearing.	17. ❑ Involve local leaders in protection.
18. Long-term or semi-permanent destruction of soils in cleared areas not suited for agriculture.	18. ❑ see 17 above.
19. Destruction or damage of terrestrial wildlife habitats, biological resources or ecosystems that should be preserved by induced development.	19. ❑ Establish wildland management areas or other protected habitats in the project's area of influence. ❑ Design buffer zones. ❑ Restore damaged habitats. ❑ Create new habitats of equivalent value elsewhere in the region to offset unavoidable loss of habitat in the project area. ❑ Strengthen existing agencies with management responsibility for wildland management areas and biological resources. ❑ Strengthen land use planning and control institutions and instruments. ❑ Promote environmental education.

Potential negative impact	Mitigation measures
20. Damaging alteration of wetland ecosystems traversed by causeways.	20. ❑ Selection of alternative sites to avoid impact on wetland. ❑ Design features to prevent disturbance of the flow patterns and hydrologic regimes critical to conservation of wetland. ❑ Artificial construction of wetlands to replace areas lost (where experience has shown that the wetland type in question can, in fact, be constructed). ❑ Strengthening institutions to mange and protect wetlands. ❑ Include local NGOs in the institutional arrangements for wetlands conservation. ❑ Promoting development of national wetland incentives and management strategies. ❑ Environmental education programs to disseminate knowledge on importance of wetlands.
21. Excessive and/or destructive development of coastal areas or other use of coral for cement and landfill, destroying parts of coral reef, uniquely endowed recreational environment made accessible by roads.	21. ❑ Control of construction contractor. ❑ Areas considered for development should have zoning plans to account for natural geographic and socioeconomic conditions. ❑ Base development phase on an inventory of resources

HANDOUT G-3

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 behavior. 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 need to 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 to the environment.
- ❑ Identify any other environmental /impact management requirements arising from regulations, policies, guidelines etc.
- ❑ Include requirements for training of staff.
- ❑ 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

- ❑ Create a time based schedule of the identified tasks and allocate responsibility for each of them (Table 1).
- ❑ Develop contingency plans that highlight actions to be taken and assign obligations in the event of the detection of unacceptable adverse impacts.
- ❑ Ensure that the those undertaking the detailed design of the project incorporate all commitments and obligations.
- ❑ Budget for the plan.

Table 1. Impact management plan-sample task schedule

No.	Task description	Responsible person/unit	Start date	Finish date	2001				2002				2003			

5. Develop a management system for monitoring, reporting and response

- ❑ Develop 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 enquiries 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 regular independent audits (compliance and surveillance).
- ❑ Update/review the impact management plan regularly.

H. Preparation of Written Documentation (Reporting)

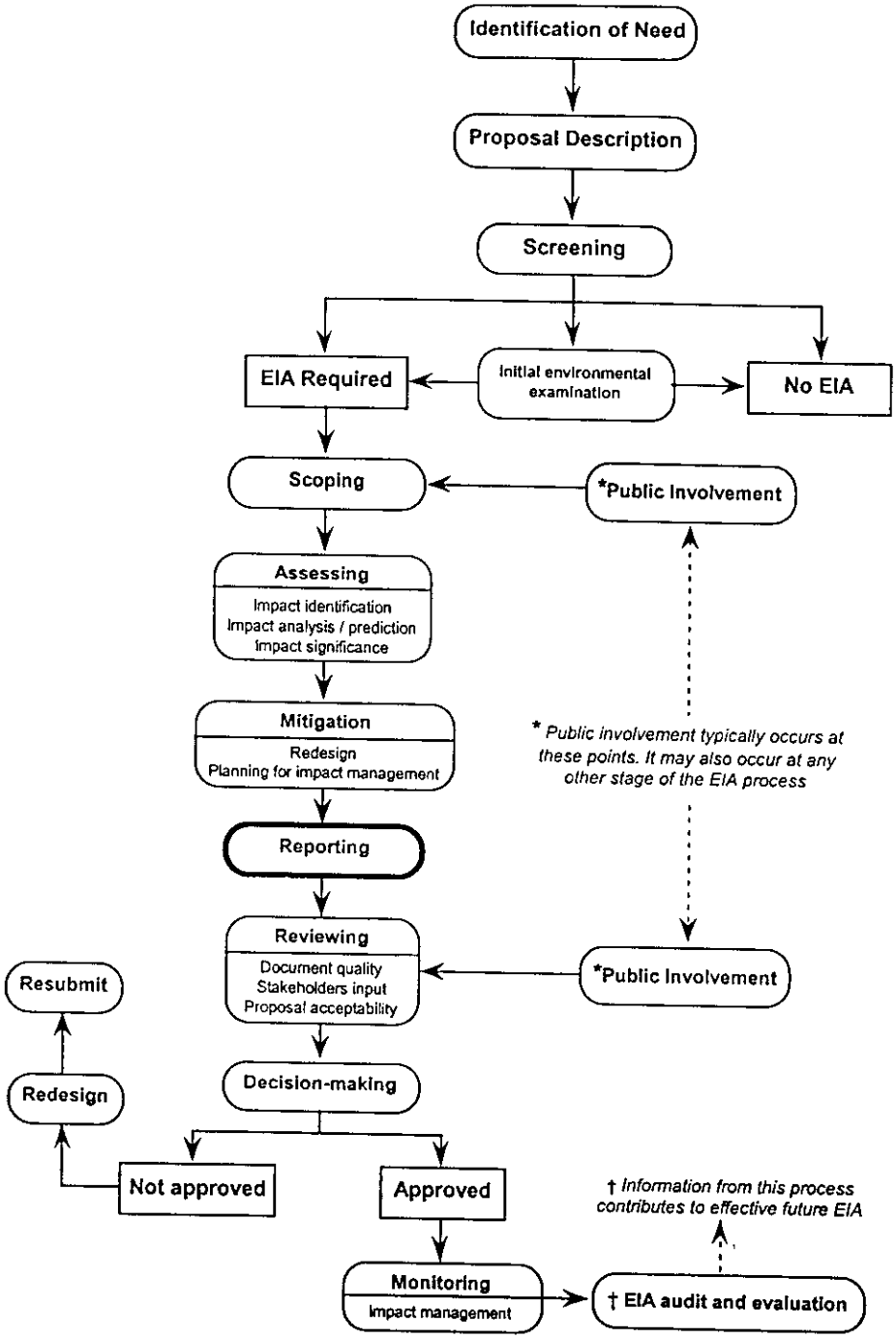

Figure H.1. Reporting in the EIA process

Introduction

EIA reports are designed to assist:

- The proponent to plan;
- The government to decide; and
- The public to understand the proposal and its impacts.

Terminology

A number of different names are used for the report produced at the end of an environmental assessment:

- Environmental Impact Statement (EIS),
- Environmental Impact Assessment report (EIA report),
- Environmental Assessment report (EA report),
- Environment Effects Statement (EES) etc.

The term '*EIA report*' is used here to denote this document.

In most cases, the project proponent is responsible for the preparation of the report that follows an EIA. Often the proponent hires consultants to manage the EIA and to produce the EIA report in compliance with the terms of reference (TOR) specified during the scoping phase of the process.

Function of Reports

Despite the range of names, all of these reports have the similar purpose of providing information (Biswas and Qu Geping, 1987; Boyle and Mubvami, 1995):

- To the proponent to plan, design and implement the proposal in a way that minimizes the negative effects on the biophysical and socio-economic environments and maximizes the benefits to all parties in the most cost effective manner;
- To the decision-maker (government or responsible authority) to decide whether or not a proposal should be approved and if so, the terms and conditions that should be applied; and
- To the public so that they can understand the proposal and its impacts on the community and environment.

In order to achieve this successfully EIA reports need to:

- Be proactive documents aimed at assisting the proponent achieve good environmental design;
- Have information arranged so that it is readily accessible and comprehensible to all parties; and
- Clearly state the issues in a non-technical way.

Main Elements of an EIA Report

An EIA report typically addresses the items listed below. It should have:

- An executive or non-technical summary (which may be used as a public involvement document);
- Description of the aims of the proposal;
- Description of the proposal and alternatives (including no development). This should be brief and attention should be paid to the major differences between the alternatives;
- Discussion of the relationship between the proposal and current land-use or other relevant policies for the area likely to be affected;
- Description of the expected conditions (biophysical, socio-economic etc) at the time of probable implementation;
- Evaluation of the impacts of each alternative with clear information on the criteria used to assign significance. Also, descriptions of the characteristics of each impact, the predictive methods and analytical techniques used, discussion of the uncertainties involved in interpreting the results and descriptions of gaps in the baseline data or other data used in the EIA work and included in the EIA report;
- Comparative evaluation of alternatives covering significant adverse and beneficial impact, mitigation and monitoring measures and identification of the environmentally preferred option if possible using a set of sustainability criteria;
- Impact management plan, monitoring plan and proposed training; and
- Appendices: all technical information and description of approaches/methods used to provide conclusions in the EIA report should be included in Appendices if they are not suitable for the main text.

Executive or non-technical summary
This is the part of the report that most people will read. It is often the **only** part of the report that people will read (including the decision-makers!). A two or three page executive summary should be written clearly and contain:

- ❑ Proposal title and location of the proposal
- ❑ Name of the proponent
- ❑ Name of the organization preparing the EIA report
- ❑ A brief outline of the proposal
- ❑ The major impacts
- ❑ Recommendations for mitigation/compensation
- ❑ Proposed monitoring

For major proposals the executive summary might extend to ten pages. The Executive Summary can often be distributed to the public as an information brochure.

Description of the aims of the proposal
This should outline the need for, or intended aims of, the proposal.

Description of the proposal and its alternatives
This more detailed description of the proposal indicates any reasonable alternatives that would meet the proposal's need, including the possibility of the 'do-nothing' alternative. Attention should be paid to the major differences between the alternatives. This section of the report should include:

- ❑ The status of the proposal in the project cycle such as pre-feasibility, feasibility, detailed engineering design;
- ❑ A description of planning/design and implementation strategies in only enough detail for impact forecasts and management measures to be understood and appreciated;
- ❑ The requirements for raw materials, water, energy, and equipment;
- ❑ The planned operational characteristics - its use, processes, products, etc;
- ❑ Visual aids such as maps, flow diagrams and photographs;
- ❑ A comparison of proposal options (such as size, siting, technology, layout, energy sources, source of raw materials) within existing economic, technical, environmental and social constraints; and
- ❑ A summary of the technical, economic and environmental features of the proposal.

Discussion of the proposal and current land use or policies
This section should show how the proposal fits into current systems, policies, strategies etc and whether or not it is consistent with them.

Description of the expected conditions
This is often covered in too much detail in an EIA report. Only enough detail should be given to allow an understanding of the impact analysis and assessment. It should contain a description of the following aspects of the proposal as they are predicted to be at the time of implementation of the proposal:

- ❑ The spatial and temporal boundaries adopted for the various aspects of the study;
- ❑ The existing (baseline) condition of the biophysical, socioeconomic etc environment as well as trends and the anticipated future
- ❑ Environmental conditions should the proposal not go ahead; and
- ❑ Environmentally-sensitive areas of special or unique value (such as scientific, socio-economic, cultural, visual etc).

Evaluation of the impacts for each alternative
The section should indicate how environmental data was gathered and the methods and criteria used to judge impact severity and significance. Wherever possible, information should be presented in summary form to help readers make a quick comparison between alternatives. One possible way to do this is to present a series of tables. For both the proposal and its alternatives, the EIA report requires a description of the potential beneficial and adverse environmental impacts, both direct and indirect, for each feature of the environment identified as important during the scoping of the study requirements. This should include:

- ❑ An assessment of any impact on the local population (including gender issues); the relevant environmental data and predictive methods used and any underlying assumptions made;
- ❑ Any gaps in knowledge and uncertainties encountered;

- Compliance with any relevant environmental standards and licensing procedures;
- The assessed significance of the impact, stating the standards or criteria used as the basis for judgement; and
- Possible measures for avoiding or mitigating the impact.

Possible cumulative or synergistic (multiplicative) effects should also be highlighted.

Comparative evaluation of alternatives and identification of the environmentally preferred option
In this section the alternative proposals should be compared, focusing on the significant adverse and beneficial impacts and mitigation and monitoring measures. The environmentally preferred option should be identified with a complete description of the following points:

- Those impacts considered to be of greatest significance and the measures proposed to avoid, reduce and/or manage them;
- The impacts the proponent is committed to managing during proposal implementation, and those impacts that are residual (that s, those that cannot be avoided or minimized);
- The distribution of costs and benefits locally and regionally;
- A statement of measures for the protection and/or resettlement of affected population groups, indicating their reactions to proposals on these issues; and
- Opportunities for environmental enhancement.

Impact management plan, monitoring plan and proposed training
This is the 'action oriented' part of the EIA report. It summarizes the measures that have been adopted to ensure that the mitigation is implemented and the impacts are in accordance with predictions. It is a plan for monitoring and managing the impacts during implementation and operation, outlining which activities will be undertaken by the proponent and which should be the responsibility of government. Environmental management and monitoring plans should:

- Contain a description of the proposed mitigation actions;
- Contain a schedule for implementation;
- Assign responsibility for implementation (by name or position of responsibility);
- Present the monitoring program to assess performance; and
- Present the proposed reporting and review procedures.
- The plans should also outline any training needs that are required to ensure that the plans can be implemented successfully.

Appendices
Appendices contain information that may be needed for reference or for detailed review by technical experts. All technical information and description of approaches/methods used to provide conclusions in the EIA report should be included in Appendices when they are not suitable for the main text. Appendices should also contain:

- A glossary;
- An explanation of acronyms;
- Summary of the management of the EIA process and the public involvement including listings of individuals and agencies consulted during the EIA;
- Sources of data and information and a full list of all reference material used;
- A list of the names, qualifications and roles of the team members who carried out the study; and
- Terms of Reference for the EIA and those given to individual specialists.

Shortcomings of EIA Reports.
Common shortcomings of EIA reports include the following (Scholten, 1995):

- Object of activity 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
- Standards and legislation are not described or alternatives do not comply with them.
- Some mitigating measures not considered
- Best alternative not described (or insufficiently described)

- Serious impacts are not mentioned or not correctly described
- Outdated or ineffective prediction models used
- Impacts are not compared with standards or targets
- Incorrect conclusions drawn

Report Preparation Guidelines

EIA reports are most often the products of a team. This is because most proposals have a number of potential impacts (biophysical, socioeconomic, health etc) and require a range of expertise to analyze them. A team leader (usually identified as the Project Manager) has responsibility for bringing together this interdisciplinary team and for managing its work. If the report is to effectively communicate the conclusions and recommendations of the impact assessment it must be written in a way that makes it accessible to:

- Local people (and particularly those affected by the proposal);
- Interest groups; and
- Decision-makers.

It should be brief, with good quality maps, charts and diagrams and have these materials captioned so that their significance is obvious. The writing (particularly of summaries) should be clear and easily understood by people without a technical background. Summaries are important. They are often the only section of the report read by the public and they need to include all significant findings. They should not, however, attempt to summarize the whole content of the report. This poses the problem for the reporting team of finding clear, short expressions of often complex arguments and recommendations.

Report Distribution

The arrangements for making EIA reports available to the public and for encouraging public input differ according to legislative and administrative requirements. As a general guide, the report should go not only to proponents, government officials and decision-makers, but also to anyone who can register a legitimate interest in the proposal. In most cases the executive summary material is particularly useful to distribute to those who don't want to read the whole document. It can also be easily translated into other languages.

If formal public consultation has occurred in the time between scoping and the production of the report it may be useful to have a section showing comments received and responses to these comments.

Reference List

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

Biswas A and Qu Geping. 1987. *Environmental Impact Assessment for Developing Countries*. Tycooly.

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Scholten J. 1995. *Reviewing EISs/EIA Reports*. Report of the EIA Process Strengthening Workshop, Canberra.

Further Reading

Bendix, S. 1984. How to Write a Socially Useful EIS. In *Improving Impact Assessment: Increasing the Relevance and Utilization of Scientific and Technical Information*. S.L., Hart, Enk, G.A., Hornick, W.F., Jordan, J.J. and Perreault, P. eds., Westview Press, Boulder, Colorado. Chapter 13.

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I. Evaluation of an EIA Report (Reviewing) and Decision Making

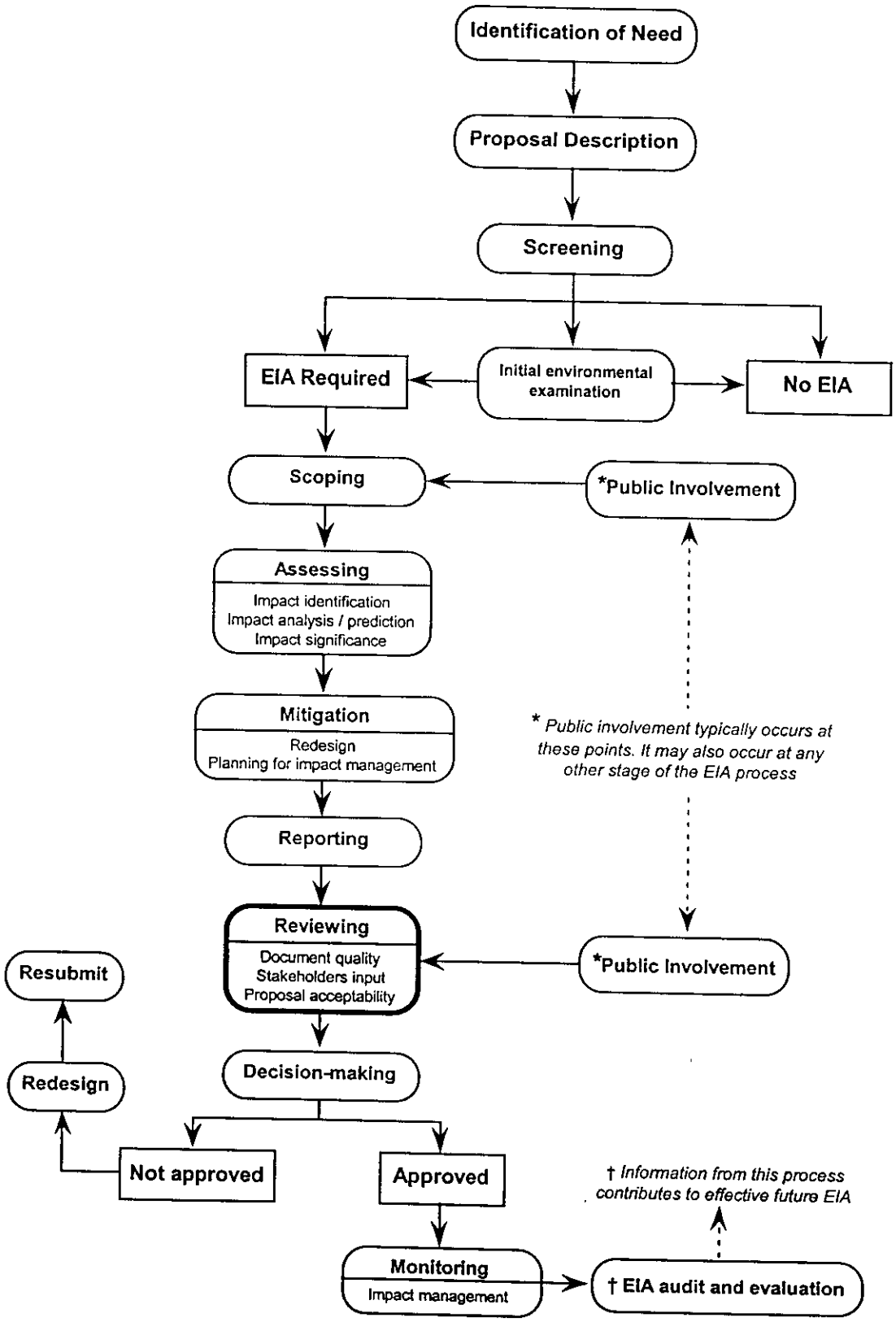

Figure I.1 Reviewing in the EIA process

Definition

Reviewing is the step in the EIA process that (Boyle and Mubvami, 1995):

- Determines whether the EIA report on a proposed activity is an adequate assessment of the environmental effects, and of sufficient relevance and quality for decision-making;
- Collects and collates the range of stakeholder opinion about the acceptability of the proposal and the quality of the EIA process that was used;
- Ensures that the EIA report and process complies with the Terms of Reference; and
- Determines whether the proposal complies with existing plans, policies and standards.

Note that the review process does not decide whether the proposal and its effects are acceptable.

Introduction

The purpose of the review is to provide the information that the decision-makers will require to decide upon the acceptability of the impacts. The review process can also be used to obtain an impartial judgement of the particular, and often conflicting, interests of parties involved and to avoid unnecessary costs and delays. Often a review will identify further information that is required or further mitigation measures that could be included. Review of EIA reports usually commences once the report has been completed. However, it can begin earlier and be used as a monitoring tool to ensure that progress is satisfactory and that the terms of reference are being complied with. It is therefore preferable for the review to be held before the final EIA report is submitted for consideration by the final decision-makers.

Members of such review panels should not be stakeholders in the proposal. When there are issues that may require further research, aspects of the proposal that require modification of the EIA report or where the report is inadequate, reviewing may be an iterative process, with the report being returned to the proponent for amendment to remedy inadequacies identified.

Review through stakeholder input can also be undertaken using information gathered in a range of ways. These include information obtained by the public display of the EIA report and the holding of meetings and briefings with affected or interested peoples. The results of this aspect of the review process need to be collated and summarized for the purposes of decision-making.

One important role of those reviewing a proposal is to check that the design complies with relevant standards and policies, or standards of good practice where official standards do not exist. For instance, proposed levels of discharges for a proposal from a multi-national company should not be greater than those allowed in the home country of the multi-national.

Review can also be carried out by proponents during the preparation of the EIA report, as part of a quality assurance process. In this way proponents can ensure that their work is of an appropriate standard before it is subject to external review. There are benefits to all stakeholders in proposals if a well-constructed, consistent and systematic set of criteria is used to review EIA reports. The general standard of EIA reports can be improved when proponents are made aware of government or agency expectations about report standard and coverage. Also, an assessment can be made of the success of the review criteria in achieving government'7s aims or in the demands that they place on proponents, and criteria can be revised as necessary.

Factors Considered in an EIA Report Review Process

The process of reviewing involves establishing a set of criteria that are to be met and the minimum standards that are to be achieved for each one. These standards will vary with the relative importance of the particular criterion. Reviewing can be carried out to decide whether:

- The report has adequately addressed the Terms of Reference;
- There is sufficient information on the objectives of the proposal and its environmental setting, alternatives, impacts, mitigation and monitoring;
- The information is correct and is scientifically and technically sound;
- The EIA process was conducted appropriately, and the points of view of all parties involved have been taken into account;
- The information has been presented so that it can be understood by both the decision-makers and the public;
- The information is relevant to the parties involved in decision-making; and
- There is sufficient information for the implications of the environmental impacts to be assessed by the decision-makers.

Steps Involved in Reviewing EIA Report
The following steps can be adopted for a best practice approach to reviewing EIA reports (Scholten, 1995):

- ❑ Set the scale/depth of the review
- ❑ Select reviewer(s)
- ❑ Use input from public involvement
- ❑ Identify review criteria
- ❑ Carry out the review
- ❑ Determine the remedial options
- ❑ Publish the review report

Setting the scale
The questions that should be addressed at the start of each reviewing process are:

- ❑ How much time is available for the review?
- ❑ Are funds available to carry out the review?

The answers to these questions will depend mainly on the nature of the proposal and will determine the speed and intensity of the 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 number of people involved in a review can range from one, for a smaller project, through to a team where projects are large and where sufficient time and money are available. The expertise required for the team must be assessed on the basis of the most important environmental issues and aspects that govern the activity. For example, the ideal composition of a team reviewing the EIA of a proposal for a sanitary landfill would include a landfill engineer, a geohydrologist and an ecologist. The team of experts can only operate well if it receives coordinating support to arrange a site visit to the project, meetings, background information and secretarial backup.

Using input from public comment
Practical experience in a number of countries has shown that seeking comment from the public is very important to the quality of the review process. The input from the public proves to be very important in checking and determining the quality of the descriptions in the EIA report including existing quality of the environment, the importance of the effects to be expected from the proposed activity and the acceptability of possible alternatives.

In some countries organizing public comment in the reviewing stage is a responsibility of the review team. In others, the review team takes note of the results of public comment processes that have been organized by the competent authority.

Identifying the review criteria
Once the organizational aspects of the reviewing process have been dealt with, the review criteria have to be selected. This can be done by answering the following set of questions:

- ❑ *Are any terms of reference/scoping guidelines available for the review?*
  If scoping guidelines are available for the EIA report, it is clear that these should be included as part of the terms of reference in the review. When no scoping guidelines have been prepared prior to the preparation of the EIA report, the first task of the review is to scope the main aspects of the project to be addressed in the EIA report. This can, for example, be done with the help of general or generic checklists.

- ❑ *Are any existing reviews of EIA reports of comparable activities in similar settings available?*
  Existing reviews of EIA reports about comparable activities and settings provide useful reference material about the type of information that is considered significant for the activity and for the decision. These can be from the country concerned or elsewhere. It is useful to learn about problems experienced during the implementation and operation of the projects. These experiences may reveal important clues to the precise nature of impacts occurring during implementation and operation.

- ❑ *Which general review criteria should be observed?*
  In addition to the specific guidelines for an EIA as mentioned above, the following factors should form the basis of general review criteria:

- Legal EIA requirements (if any);
- National and regional environmental target values, standards, guidelines or criteria about emission levels and environmental
- Qualities (e.g. sulfur dioxide and nitrous oxide levels governing air quality, drinking water standards, etc) directly related to the activity;
- The state of the development of technological and environmental sciences involved in the EIA report;
- The quality of the scoping and screening;
- The quality of impact prediction;
- The quality of the evaluation of the impact significance;
- The assessment of alternative options;
- The quality of the mitigation proposed; the quality of the monitoring proposed;
- The involvement of the local people in the EIA process;
- The significance of impacts in view of the decision; and
- The clarity of statements and the presence of a concise executive summary.

How these criteria are reviewed depends very much on the time available and the expertise in the review team.

In the review, special attention must be given to the quality of the executive summary of the EIA report. In the summary, the significance of the impacts must be explained concisely in a non-technical manner. Decision-makers and most readers of the EIA report usually study only the summary. Hence, if the summary does not reflect the substance of the issues in the EIA report, the EIA report has not communicated an important part of its message to the decision-makers and to the public.

Carrying out the review
The actual execution of the review could progress through three steps:

Step 1: identify the deficiencies in the EIA report using the scoping guidelines, review criteria and a review of any comparable EIA reports and their reviews.

Step 2: focus on any crucial shortcomings observed in the EIA report and determine which shortcomings are so crucial that they directly influence the decision. In other words, the review must clearly separate the crucial shortcomings from the less important deficiencies. If no serious omissions are found, the review report must state this clearly. Remarks about less important deficiencies which have no crucial significance to the decision should be deleted from, or where appropriate be moved to an appendix of, the review report.

Step 3: Recommend to the appropriate authority how, and when, any serious shortcomings should be remedied to assist decision-making and improve its implementation.

Determining remedial options
Three remedial options are available when an EIA report fails to meet the standards required. These are based on the nature and extent of the inadequacies.

- *The shortcomings of the EIA report are so serious that they require immediate remedy in the form of a supplement to the EIA report or a new EIA being undertaken by a different, more competent team.*
  In this situation, the review report must give a clear statement as to how the additional information can be collected and presented. The review team must realize that the decision-making will be delayed by some time until the new report or supplement to the EIA report is completed.

- *The shortcomings can be rectified fairly easily by means of a set of explanations and conditions attached to the decision.*
  This situation has the advantage that the decision-making can proceed as planned without considerable delay in 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 may recommend monitoring shortcomings during the implementation and operation of the activity with possible corrective measures if impacts turn out to be worse than expected. In some rare cases the proposal or the EIA report can be so unacceptable that the proposal is rejected.

Publishing the review report

If the review concerns only a judgement of the quality and adequacy of the environmental information in the EIA report, the completion of the third step signals the end of the review. In this case, the reviewing report contains either a clear statement that no serious shortcomings are noted, or an overview of these shortcomings, including recommendations on how these could be remedied.

However, in some countries the result of the review process can also include advice on whether or not to proceed with the activity. Then an additional step must be added to the three steps mentioned above:

Step 4: give either the green or the red light to the activity. It may alternatively give a yellow light indicating a conditional decision.

If this extra step is required, it must be emphasized that the review should follow the three-step approach as outlined above and remain as objective as possible, before addressing the final question of whether to proceed with the proposed activity or not. If this is not done, the review runs the risk of being inclined too early towards a decision in favor of a certain solution without proper assessment of the quality of the information provided.

Methodologies for EIA Report Review

Just as in the impact analysis process itself, there is also a range of methods that can be used to review the adequacy of an EIA report. These methods include: general checklists, project specific checklists or guidelines, ad hoc processes, expert opinion, accredited reviewers, public review, panels of inquiry, independent commissions and legal approaches (Table I.1).

Table I.1. Methodologies for EIA report review

Methodologies	*Description*
General checklists	These can be developed using compliance with the local legislation or guidelines as the starting point. A range of criteria based on the points outlined in the section above can then be incorporated. Specific sectoral checklists can be developed from this to cover the consideration of impacts, mitigation, monitoring and scientific and technical adequacy
Project specific checklists and guidelines	These are much more successful if they are based on a general or sectoral checklist and then adapted to suit the requirements of the specific project and its terms of reference.
Ad hoc processes	Ad hoc processes are the most open to controversy and corruption. This approach greatly reduces the ability of government to set appropriate standards for documentation and reduces the opportunities for building local capacity.
Expert opinion, accredited reviewers	Reviews carried out by a consultant (of known ability), academic or other institutions, NGOs or an accredited reviewer.
Public review	Public opinion can be sought on the adequacy of the report. This opinion can then be given to the decision-maker for consideration in the decision-making process.
Panels of inquiry and independent commissions	This approach requires the availability of independent experts to review the EIA report and make recommendations to the decision-maker. Usually such inquiries can call for more technical analysis to be carried out and can seek public opinion on the proposal. This approach is generally regarded as being very fair and is well received by the stakeholders in the process.
Legal approaches	Some countries allow the adequacy of an EIA report to be challenged in a court of law. While this has beneficial effects in terms of proponent compliance, it can prove to be very expensive.

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.

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Commission of the European Communities, Directorate General for Environment, Nuclear Safety and Civil Protection. 1993. *Review Checklist.* Environmental Resources Management (ERM), London.

HANDOUT I-1

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 Center. 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.

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 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
- ❑ 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 in Figure I.

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 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.

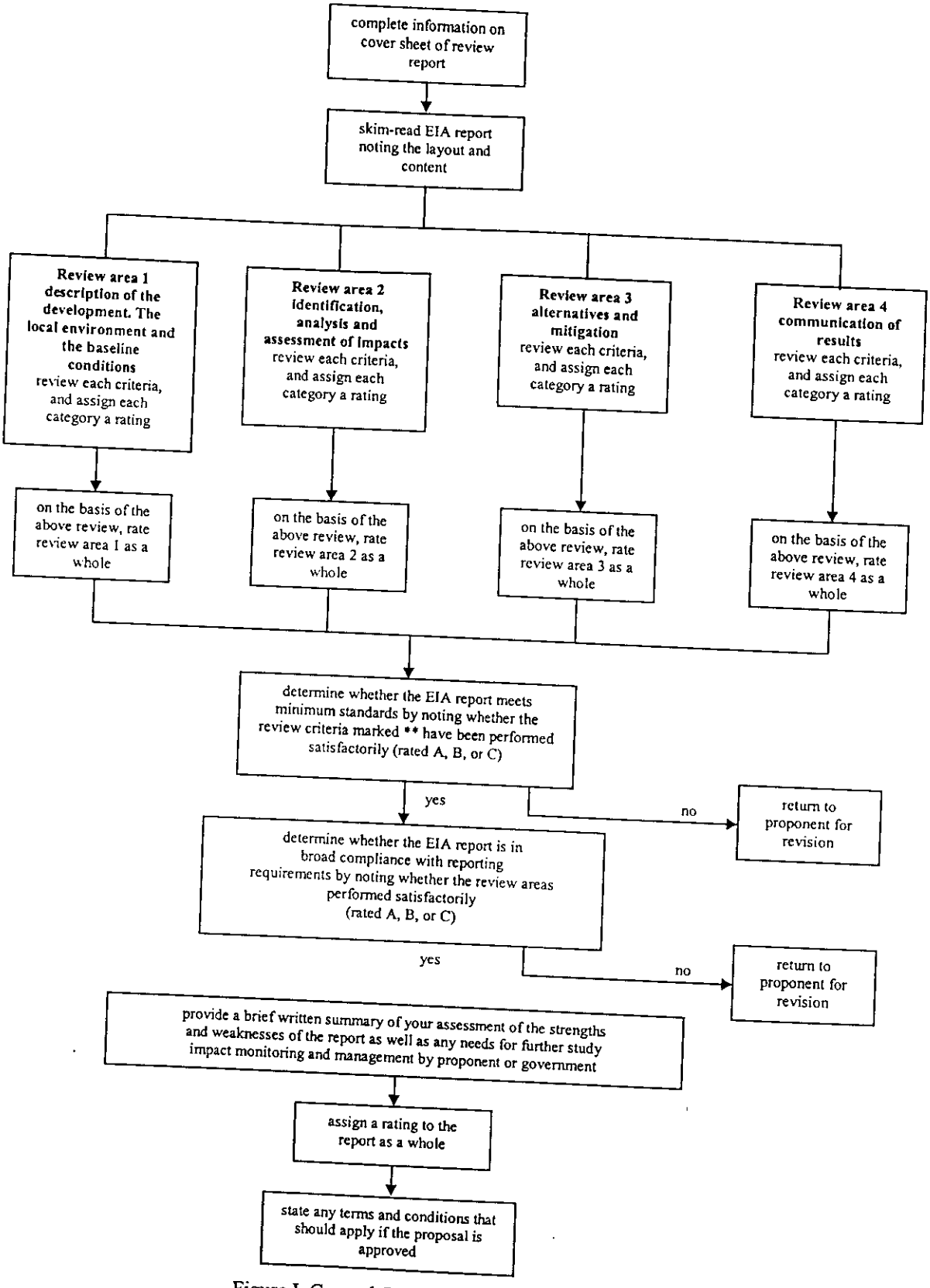

Figure I. General flow chart of review process

Review of EIA Report

EIA report title and date:

EIA report reviewed by:

Dates of review:

Table I. 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

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, ie rate A, B or C?

YES NO

(If not the report should be returned to the proponent for revision.)

2. Broad compliance

Did **all** four review areas perform satisfactorily, ie 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.

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 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 minimize 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**	
*(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		

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**	
*(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		

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**	
*(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		

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**	
*(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		

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 field work 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 organizations.	**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**	
*(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 1	**A B C D E F**
Comments	

Review Area 2
Identification, Analysis and Assessment of Impacts

2.1	**Identification of Impacts: all potentially significant impacts are identified. Key impacts are also identified and the main investigation centered 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 in methods are described and their use justified.	**rating****
Overall grade for category 2.1 *(note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)*	**A B C D E F**	
Comments		

2.2	**Analysis of Impact Severity: the likely impacts of the development on the environment are analyzed and described in as precise terms as possible.**	
2.2.1	Impacts are analyzed 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. An 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 (eg 'minor' means not perceptible from more than 100m distance).	**rating**
Overall grade for category 2.2 *(note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)*	**A B C D E F**	
Comments		

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 verity.	**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 *(note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)*		**A B C D E F**
Comments		
Overall evaluation of Review Area 2		**A B C D E F**
Comments		

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 labor) 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 program 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**
Comments

4.1	**Public Involvement: there were genuine and adequate consultations with concerned project stakeholders to appraise 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 in 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		
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 *(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		

4.5	**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** *(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 4 **A B C D E F**		
Comments		

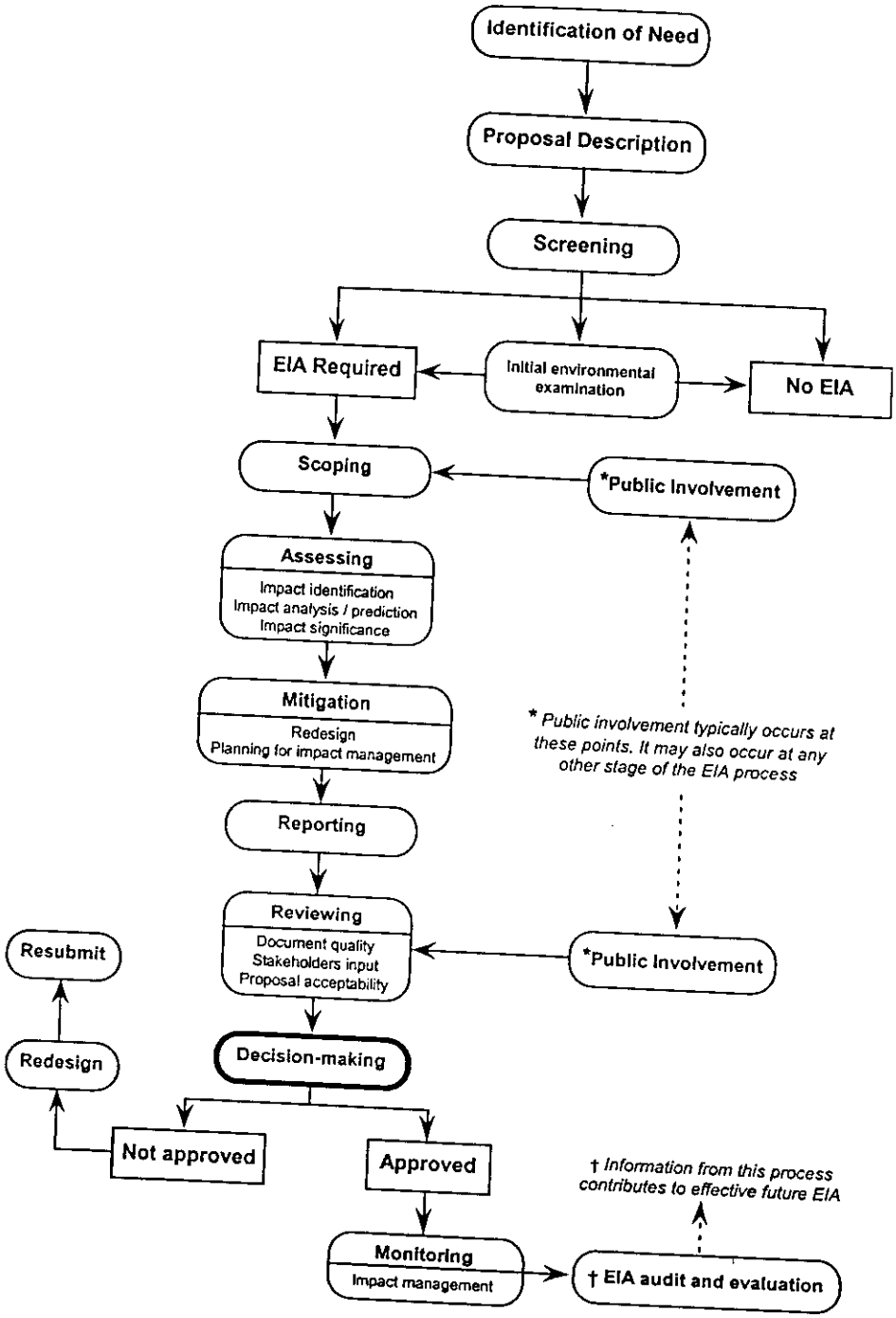

Figure I.2. Decision-making in the EIA process

Introduction

EIA is a process of review, negotiation and incremental decision-making. It culminates in an essentially political choice about whether or not the proposal is to proceed, and under what conditions. When the term 'decision-making' is used in EIA it is usually taken to mean the final approval or authorization of a proposal. In certain cases EIA review bodies have decision-making power; that is, their rulings are binding unless explicitly overturned by executive convention.

Because the policy and legislative basis for EIA differs from country to country, there are usually a number of smaller decisions made at each stage throughout the process. Each of these decisions may be made by a different person or group of people. For instance, some decisions, such as with screening and scoping, are made jointly by the proponent, the responsible Minister and the environmental authorities. Other decisions, such as the selection of a viable alternative, may be made by the proponent. As noted, the final approval of a proposal is usually political, typically one in which a broader range of trade-offs are made. Sustainable development requires striking a balance among ecological, equity and economic considerations.

Roles and Responsibilities of the Decision-maker

Decision-makers can no longer disregard the influence the environment has on people, business and quality of life. In a world of competing interests, diminishing resources and growing public involvement, a decision-maker needs to take advantage of EIA so that a common focus may be brought to bear on divergent agendas. Astute decision-makers can use EIA to create opportunity where none may have existed and still meet the corporate, governmental or public needs of their respective organizations.

It is important for decision-makers to be aware of the responsibility they have in ensuring that the EIA process is of benefit to a proposal. At a minimum a decision-maker needs to understand:

- The basic concepts and aims of EIA;
- How EIA is used around the world and in comparable organizations;
- EIA requirements as prescribed by corporate, national or international guidelines, policies, legislation or conventions;
- How EIA is being implemented within the organization responsible for the decision on the proposal and the implications of EIA;
- Procedures for this decision-making; and
- The political, legal and management implications of public review or challenge associated with an EIA.

With the new mandates of sustainable development and environmental stewardship, decision-makers need to have the knowledge and tools to allow them to:

- Broaden their perspectives of the environment and establish new values;
- Acknowledge and implement new mandates and responsibilities;
- Use new forms of information;
- Find more effective ways of sharing and communicating this information;
- Re-examine traditional ways of relating environmental concerns to proposals;
- Define new ways of measuring progress, status, change and profit;
- Become familiar with new ways of managing and accounting;
- Adopt more consultative and participatory planning and decision-making processes;
- Devise more effective means of influencing individuals and organizations to behave in more sustainable ways; and
- Learn about comprehensive, technical approaches to planning, evaluation, assessment, data management and problem solving.

Those who make the final decision about project approval are expected to use the information provided by environmental impact assessment, along with information obtained from other sources, to inform them of the environmental consequences of their decision-making. Wood (1995) notes that "the making of any decision will involve a large number of trade-offs in the information base: between simplification and the complexity of reality; between the urgency of the decision and the need for further information; between facts and values; between forecasts and evaluation; and between certainty and uncertainty. The people making the decision on a proposal involving EIA will frequently be elected central, state or local government politicians. They will seldom have time to read the EIA report and other EIA documentation and will therefore be dependent upon their officials for some sort of summary evaluation of the earlier stages of the EIA process."

Inputs to Decision-making

Figure I.3 shows that EIA is rarely the sole basis for decision-making, but that it should have a major influence. The decisions that are made may, or may not, be those that cause the least environmental damage. An important question, on which opinion varies, is whether EIA should be neutral or value free or make the case for the best practical environmental option as well as minimizing environmental damage - essentially providing 'contestable advice' based on disparate analysis. The predominant view is that "the role of the assessor is to estimate impacts, and then to report them in a form that makes them readily understandable to citizens and decision-makers. It is not the responsibility of the assessor to convince the decision-maker to cast his vote in favor of the environment. However, he is responsible for bringing environmental issues to the attention of decision-makers. (Folk, 1982)"

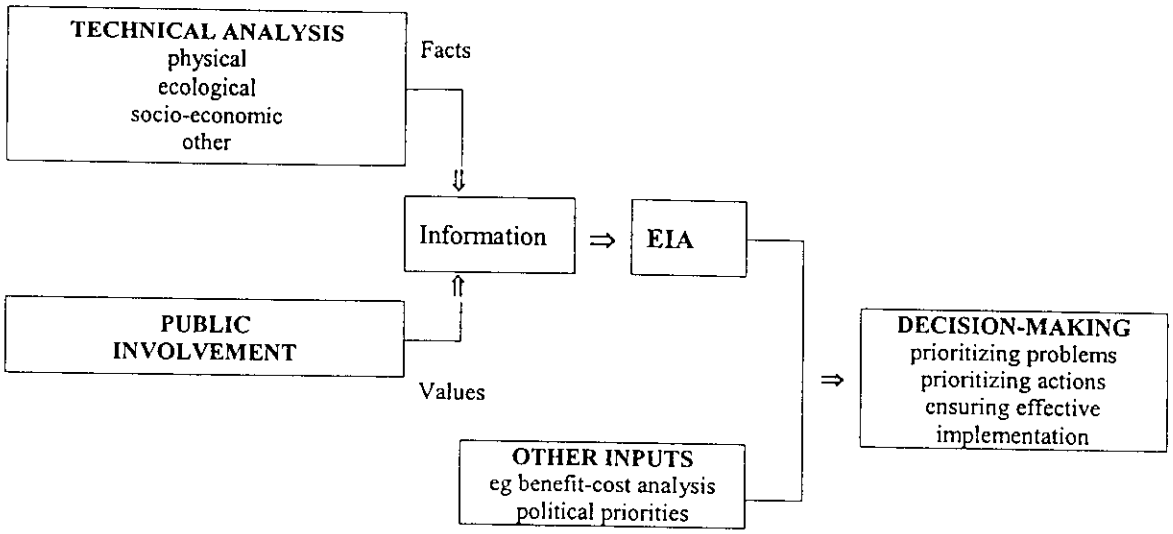

Figure I.3. Inputs to decision-making

Information Considered Important for Decision-Makers

Table I.2 lists basic requirements for EIA reports which will a decision-maker in order to make a final decision.[2]

Table I.2 Basic requirements for EIA reports

Information	*Description*
Background	❑ Background to the project and the most important environmental issues involved
Policy context	❑ The basic development issue or problem being addressed (e.g. 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	
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)

Possible Outcomes of EIA

The extent to which the decision-maker has to use or consider the findings and recommendations of an EIA varies from one jurisdiction to another. Usually there is a requirement for the decision-maker to take the findings into consideration during the decision-making process. Depending upon the legislation, the decision-maker may:

- Have complete discretion to make a decision without providing justification;
- Be able to make a decision that does not incorporate all of the recommendations of the EIA process but has to publicly explain the reasons why this has been done; or
- Have to act fully in accordance with the EIA recommendations.

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

- The proposal can be approved;
- The proposal can be approved with conditions;
- The proposal can be approved subject to on-going investigations;
- Further investigations of particular issues can be requested before the EIA report is reconsidered;
- A supplementary document or new EIA report can be requested if there are any significant problems with the original investigation or EIA report; and
- In a very small number of cases the proposal, as formulated, may be rejected.

Criteria for Decision-making

A number of checks and balances are built into EIA processes which help ensure accountability and transparency. At the most fundamental level, this means that the approvals for the proposal are made by a body other than the proponent, and that reasons for the decision and any conditions attached to it are made public. In some jurisdictions this goes as far as including an explanation of how the EIA report and review influenced the decision.

There may also be provision for public right of appeal against the decision. This can increase public confidence in the process, although it may raise costs and add to delays.

The following criteria for decision-making, adopted by major western EIA systems, suggest a number of effective checks and balances, Wood (1995):

- The findings of the EIA report and review are a central determinant of the decision on the action;
- The decision can be postponed until the EIA report has been prepared and reviewed;
- Permission can be refused, conditions imposed, or modifications demanded at the decision stage;
- The decision is made by a body other than the proponent;
- A summary evaluation is prepared prior to the decision being made public;
- The decision, the reasons for it, and the conditions attached are published;
- These reasons include an explanation of how the EIA report and review influenced the decision;
- Public guidance on the factors to be considered in the decision exists;
- Consultation and participation is required in decision-making;
- There is a right of appeal against decisions; and
- Decision-making functions effectively and efficiently.

Implementing the Decision

Most approvals made as a result of EIAs will require modifications to the original proposal and impose conditions and performance standards. Any conditions imposed should take into account the forecasts made in the EIA, but should realistically reflect any uncertainty in these forecasts. Decision-makers need to be told of any doubt about the reliability of data used in the EIA, any gaps in this information, and any limitations placed on the assessment because of these deficiencies. A variety of techniques exist to ensure that the imposed conditions are met including:

- Placing performance conditions into legally binding contracts of the builder;
- Making the approval conditional upon the production of a suitable impact management plan;
- Using quality assurance and environmental management systems to ISO standards; and
- Independent compliance monitoring to identify breaches of conditions and the provision of penalties for non-compliance.

Reference List

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

Folk, M. 1982. *A Review of Environmental Impact Assessment Methodologies in the United States.* Institut fur Orts – Regional and Landesplanung, Zurich.

Organization for Economic Cooperation and Development (OECD)/Development Assistance Committee (DAC). 1994. *Towards Coherence in Environmental Assessment: Results of the Project on Coherence of Environmental Assessment for International Bilateral Aid.* OECD/DAC, Canada.

Wood C.M. 1995. *Environmental Impact Assessment: A Comparative Review.* Longman Higher Education, Harlow.

Further Reading

Bisset R. 1996. *EIA: Issues, Trends and Practice.* The Environment and Economics Unit UNEP, Nairobi

Lawrence D.P. 1993. 'Quantitative versus Qualitative: A False Dichotomy?'. *Environmental Impact Assessment Review.* Vol. 13 pp. 3-11.

Resource Assessment Commission. 1992. *Multi Criteria Analysis as a Resource Assessment Tool.* Research Paper No. 6. pp. 1-11.

Sadler B. 1996. *Final Report of the International Study of the Effectiveness of Environmental Assessment.* Canadian Environmental Assessment Agency (CEAA) and International Impact Assessment Association (IAIA), Canada.

J. PUBLIC PARTICIPATION IN THE EIA PROCESS

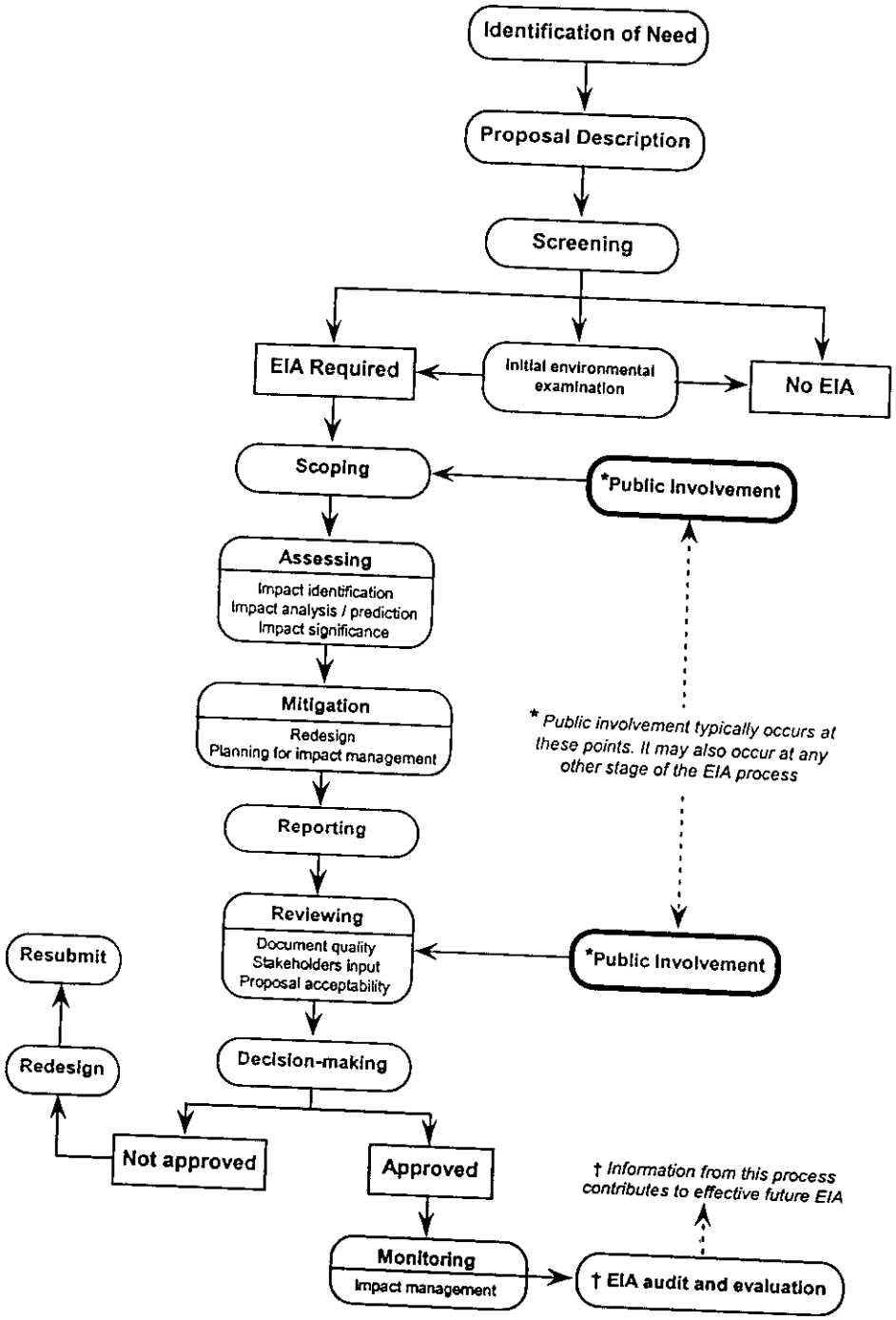

Figure J.1. Public Participation in the EIA process

Introduction

Public involvement is a feature of nearly all EIA systems and can lead to better and more acceptable decision-making. It can be time consuming and demanding, yet without it, proposals are seldom soundly based, and there is likely to be antagonism from people affected by them. Public involvement, undertaken in a positive manner and supported by a real desire to use the information gained to improve the proposal, will lead to better outcomes, and lay the basis for ongoing positive relationships between the participants.

Typical Stakeholders

The public involvement of stakeholders in EIA is widely recognized as a fundamental element of the process. Timely, well planned and well implemented public involvement programs have contributed to the successful design, implementation, operation and management of proposals. The range of stakeholders involved in an EIA typically includes:

- The people, individuals or groups in the local community;
- The proponent and other project beneficiaries;
- Government agencies;
- NGOs; and
- Others, such as donors, the private sector, academics etc.

Local people

Individuals or groups in the local community will want to know what is proposed; what the likely impacts are; that their values are known, understood and taken into account; and that the suggestions they may offer will be carefully considered on their merits. They will want proponents to listen to their concerns and address them. They will also have local knowledge that can be tapped (Scott, 1991).

Proponents

Many proponents will share some of the above objectives, and will have others as well. Proponents will wish to shape the proposal to give it the best chance of success. This often involves achieving increased public understanding and acceptance of the proposal through the open provision of information. The design can also often be improved through the use of local knowledge and an understanding of local values.

Government agencies

For administrators and decision-makers, an effective public involvement program can mean that the project is less likely to become controversial in the later stages of the process.

NGOs

Comments from NGOs often provide a useful broader public perspective on a proposal. Their views can also be very helpful when there are difficulties with involving the local people (although these can never fully replace those solicited directly from the people themselves).

Others

Other interested groups such as those working in tertiary institutions and experts in particular fields can also make a significant contribution. The advice and knowledge of government agencies and utility service providers should also be sought.

Objectives of Public Involvement

The objectives of public involvement can be summarized as follows:

- Informing the stakeholders about what is proposed and providing the opportunity for creating a sense of ownership of the proposal;
- Providing an opportunity for those otherwise unrepresented to present their views and values, therefore allowing more sensitive consideration of mitigative measures and trade-offs;
- Providing those involved with planning the proposal with an opportunity to ensure that the benefits are maximized and that no major impacts have been overlooked;
- Providing an opportunity for the public to influence project design in a positive manner;
- Obtaining local and traditional knowledge (corrective and creative), before decision-making;
- Increasing public confidence in the reviewers and decision-makers;
- Providing better transparency and accountability in decision-making; and
- Reducing conflict through the early identification of contentious issues.

More intangible benefits flow from public involvement as participants see that their ideas can help to improve proposals. People gain confidence and self-esteem through taking part in the process and perceptions are expanded by meeting, and exchanging ideas and information with, people who have different values and views.

Identifying EIA stakeholders

People who may be directly or indirectly affected by a proposal will clearly be a focus for public involvement. Those directly affected can often be easily identified. They may be project beneficiaries, those likely to be adversely affected, or other stakeholders. The identification of those indirectly affected is more difficult, and to some extent it will be a subjective judgement. For this reason it is good practice to have a very wide definition of who should be involved, and to include any person or group who thinks that they have an interest. Sometimes it may be easier to consult with a representative from a particular interest group. In this case the choice of group representative should be left to the group itself.

Care is required to ensure that a fair and balanced representation of views is sought and that the views of the poor or minority groups are not overwhelmed by those of the more influential or wealthy.

Terminology

There is no consistent set of definitions of the terms used to describe the different types of public involvement in EIA. For instance it is common to find the terms 'consultation' and 'participation' used interchangeably by some organizations whilst being taken to mean quite different things by others. In practice these subtle differences in terminology would usually be clarified by the detailed requirements of any public involvement program. However, it is useful to be sensitive to them when interacting with others who may have a different experience or perspective.

Levels of Public Involvement in EIA

The level of public involvement required for a particular proposal will depend on its social and political context. Public involvement can vary from merely informing the public about what is proposed, through consultation, to full participatory decision-making (Table J.1). While the various levels of public involvement seem quite discrete, in most EIAs the distinctions between the levels will be blurred. The processes of public consultation and public participation provide many opportunities and paths through which decision-makers become aware of the concerns of the participants, and can have a major influence on decision-making through informal means. The extreme case of full public participation in decision-making is rare because most decision-makers have a reluctance to share their decision-making power with the affected community, feeling that they (the decision-makers) have a responsibility to make decisions on behalf of the wider community.

Table J.1. Levels of public involvement in the EIA process (adapted from Bass *et al.*, 1995)

Level	*Description*
Informing	❑ One way flow of information from the proponent to the public
Consulting	❑ Two way flow of information between the proponent and the public ❑ Opportunities for the public to express views on the proposal
Participating	❑ Proponent and the public involved in shared analysis and agenda setting involved in decision-making through reaching consensus on the main elements

Table J.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.

There are a number of basic principles that can be followed to help ensure a successful outcome when using public involvement techniques:

- Sufficient relevant information must be provided in a form that is easily understood by non-experts (without being simplistic or insulting);
- Sufficient time must be allowed for stakeholders to read, discuss and consider the information and its implications;
- Sufficient time must be allowed to enable stakeholders to present their views;
- Responses should be provided to issues/problems raised or comments made by stakeholders. This enables public confidence in the public involvement and the EIA process to be maintained; and
- The selection of venues and the timing of events should encourage maximum attendance and a free exchange of views by all stakeholders (including those that may feel less confident about expressing their views).

Early Planning for Public Involvement Program

Planning by the proponent for a public involvement program needs to begin before any other work is carried out on the EIA. Otherwise, once work commences on the technical aspects of the process it can be difficult for the EIA team to focus on other aspects (even when there is a social scientist on the team). Where there are Terms of Reference (TOR) for the proposal they should include an outline of the proposed program detailing the scope, timing, techniques and resources for the interaction. If there are no TOR, or it is not possible to integrate a program into them, then it is best if a separate document is prepared by the EIA

team leader with advice and input from a social scientist who has knowledge of the local cultures and participation techniques.

The plan will detail means of informing the public about the study process, objectives and proposals at an early stage; ways in which the public will be informed about progress with the study and feedback on community concerns; and ways in which the public will be encouraged to become involved in sharing their knowledge, values and concerns. It will also detail the resources (people and money) available to support the plan. In this respect, some money may be allocated specifically to assist the community to contribute to the study (e.g. to defray travelling costs, to recompense community representatives for time spent on their involvement, and to allow representatives to report back to their constituents). Money should also be provided to hold meetings and inquiries within the local community. The development of a public involvement program would typically involve consideration of the following issues:

- The objectives of the EIA;
- Identification of interested and affected parties (stakeholders);
- Budgetary/time constraints and opportunities;
- Identification of appropriate techniques to involve or consult with the stakeholders;
- Traditional authority structures and decision-making processes;
- Identification of approaches to ensure feedback to the involved stakeholders; and
- Identification of mechanisms to ensure consideration of stakeholders' views, opinions and suggestions.

Public Involvement in the EIA Process

Ideally, the public involvement program should commence at the screening stage of a proposal and then continue throughout the whole EIA process. This is represented in Figure J.2 and produced by The World Bank to show how public involvement is incorporated into its procedures.

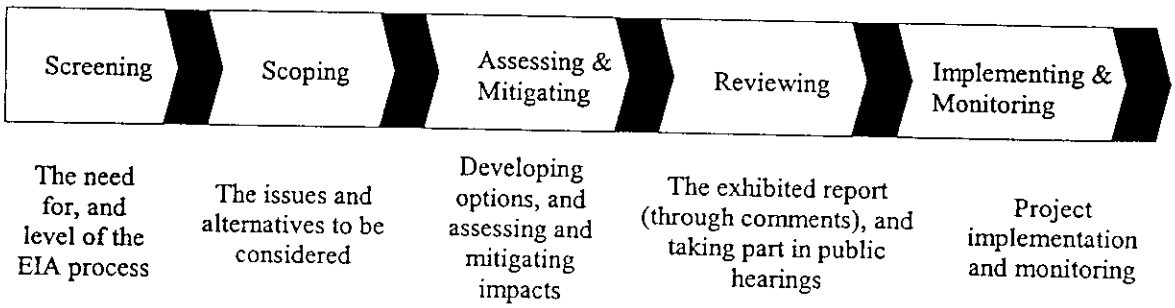

Figure J.2. Public Involvement in the World Bank's EIA Process (World Bank, 1995)

Screening — EIA authorities may consult with people likely to be affected by a proposal in order to understand more clearly the nature and significance of the likely impacts. This information will assist in screening to determine if EIA is required and, where there are a range of levels within the EIA system, the appropriate level.

Scoping — Public involvement is commonly undertaken at the scoping stage, in order 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.

Assessing and mitigating — The further involvement of the public in these phases of the EIA preparation (which are often iterative in nature) can help to avoid biases and inaccuracies in the analysis, can reveal local values and preferences (allowing a more informed analysis of impacts and options), and can assist in the consideration of mitigating measures which will be incorporated into the favored alternative(s).

Exhibition and reviewing — When EIA reports are exhibited for comment, a further opportunity for public involvement is provided. Making written comments is daunting to all but the most educated and articulate, and other means of achieving responses should be provided. Public hearings are often held at this stage, and can be structured in a formal or informal manner to enable affected people to have their say.

Implementing and monitoring

Following project approval, the detailed design, construction and operating phases proceed. Increasingly, it is realized that the evolution of projects through these phases, and in combination with other changes and developments, can present environmental challenges which require adaptive management. An emphasis on environmental management, and the participation of local representatives in the monitoring process, can assist proponents and approval agencies to respond to problems as they arise. Such interaction with local communities will also promote good relations between a development and its neighbors, to the benefit of all.

Factors Ensuring Effective Public Involvement

There are a number of potential constraints to effective public participation (Table J.3):

Table J.3. Potential constraints to effective public participation (Boyle and Mubvami, 1995)

Constraints	*Description*
Poverty	Involvement means time spent away from income-producing tasks, and favors the wealthy.
Rural settings	Increased distances make communication more difficult and expensive.
Illiteracy	May be combined with the lack of command of non-local languages, can inhibit representative involvement if print media is used.
Local values/ culture	Behavioral norms or cultural practice can inhibit involvement of some groups, who may not feel free to disagree publicly with dominant groups.
Languages	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 for resources.
Interest groups	May have conflicting or divergent views, and vested interests.
Confidentiality	Can be important for the proponent, and may militate against early involvement and consideration of alternatives.

Consensus Building and Dispute Resolution Mechanisms

Conflict management and resolution approaches 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. (World Bank, 1995)

It may be possible to plan and implement a proposal without conflict, providing the involvement of all stakeholders is sought at the earliest stage of the proposal, and their interests are understood and met. Identification of the various stakeholders and sensitivity to their interests will assist in finding consensus. In most cases, however, the range of interests and the different values of the participants will mean that consensus is unlikely. There are some general principles which, if applied, can minimize the areas of dispute, and focus attention on those key issues that cannot be resolved. Resolution in these areas will then involve 'winners' and 'losers', through a decision-making process which may be political, or may involve arbitration.

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

- Involving all those likely to be affected, or have a stake in the matter;
- Communicating the 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 those concerns;
- Treating people honestly and fairly, establishing trust through a consistency of behavior;
- 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;
- Where others' interests cannot be accommodated, mitigating impacts to the greatest extent possible, and looking for ways to compensate for detriment;

- Establishing and maintaining open two-way channels of communication throughout the planning phase, and beyond into implementation; and
- Acknowledging the concerns and suggestions of others, and providing feed-back on the way these matters have been followed up and evaluated.

Where 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 satisfactory outcomes. 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.

Reasons for Avoiding Public Involvement
Most of the risks associated with public involvement can be avoided with sound planning. Perhaps more importantly, the lack of consultation and participation may pose a much greater risk to projects in the long term. Some of the common 'reasons' that are put forward as justification for avoiding public involvement are given in Table J.4.

Table J.4 Common reasons put forward for avoiding public involvement

Reason	*Explanation*
It's too early; we haven't yet got a firm proposal	The early provision of information to the public will minimize the risk of untrue and damaging rumors about the proposals. Even though the proponent may not have a clear idea of project details, communicating the objectives of the proposals will start to build trust with the community, and can allow useful public input on site constraints and alternatives. The trend in EIA is to undertake public involvement in the feasibility stage when options are still being considered, so that the community concerns 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, 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, and projects which do not achieve their aims.
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 program. Such a program can, however, 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, and the project is considered necessary for other compelling reasons, the public involvement program should demonstrate to all that the concerns of segments of the community have been fairly treated.
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 programs 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 program to ensure that unreasonable expectations are not raised. Decisions which have already been made, and which foreclose options, should be communicated at the earliest possible date. The purpose of the community involvement, the study process, and the decision-making process, should all be clearly communicated.
The local community won't understand the issues involved.	Lack of technical education does not negate intelligence and the understanding people have of their own surroundings. Often people's knowledge of their environment and how it will react to change can be more accurate than that predicted by models.

Conclusion
No public involvement program will be effective unless the proponent genuinely wishes to engage in a two-way dialogue with the community. This spirit of openness needs to embrace a willingness to listen to the information, values and concerns of the community, to amend the proposal so as to minimize community concerns, and to acknowledge the value of community input.

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

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Further Reading

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K. Monitoring and Performance Assessment

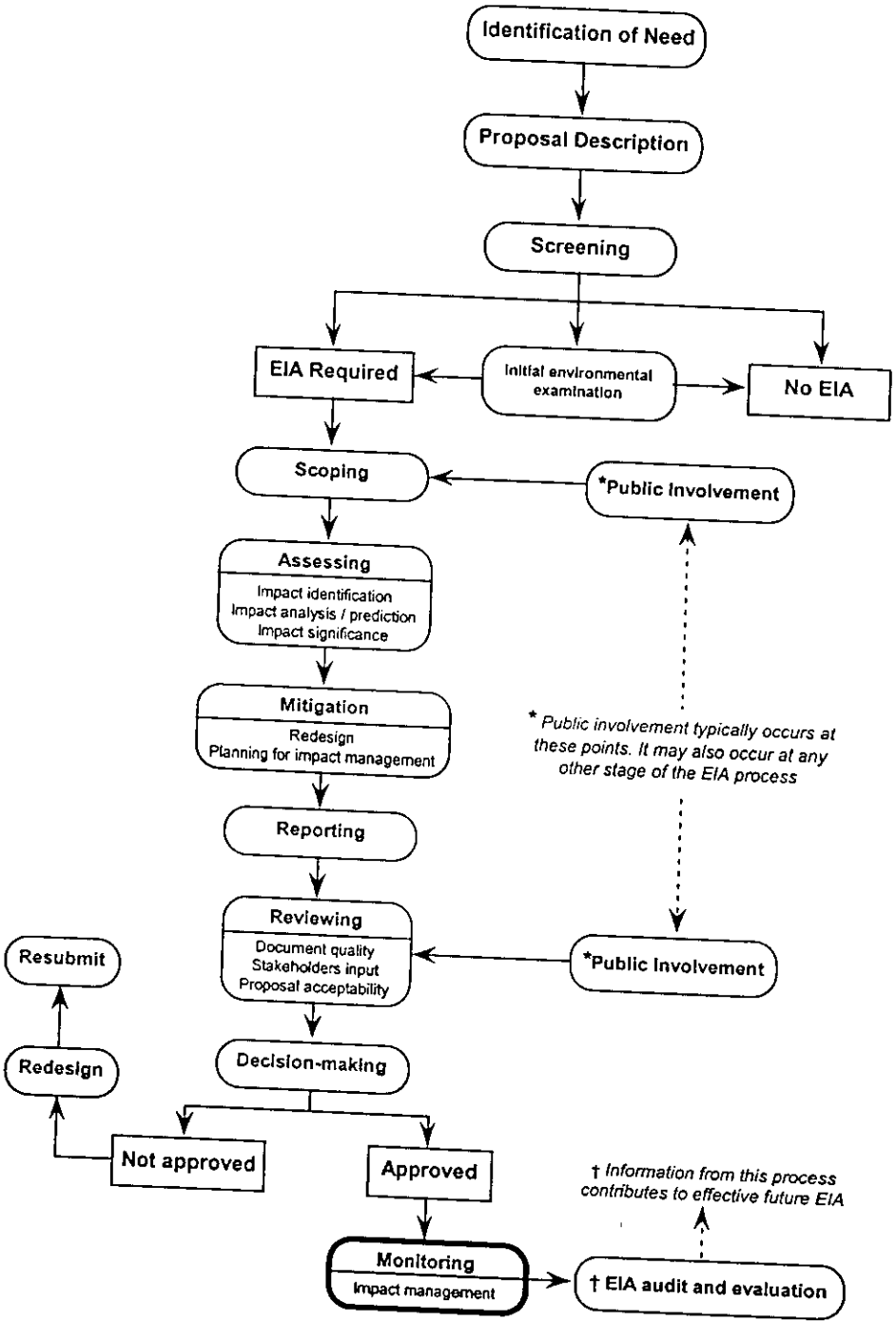

Figure K.1. Diagram showing monitoring as one part of impact management

Introduction

Monitoring and auditing are used to see what actually occurs and to ensure that the anticipated impacts are maintained within the levels predicted, unanticipated impacts are managed or mitigated before they become a problem and the benefits expected from the EIA are achieved as the project proceeds. EIA monitoring is the planned, systematic collection of environmental data to meet specific objectives and environmental needs (ECE, 1990). Monitoring can be used to ensure that the benefits anticipated as a result of the EIA are effectively achieved as the project proceeds (EPA, 1995). Monitoring involves the planning of a monitoring program, the collection and analysis of samples and the interpretation and reporting of data. Data compiled from monitoring can be used to:

- Document the baseline conditions at the start of the EIA;
- Assess performance and monitor compliance with agreed conditions specified in construction permits and operating licenses and modify activities or mitigation measures if there are unpredicted harmful effects on the environment;
- Review predicted environmental impacts for the effective management of risks and uncertainties;
- Identify trends in impacts;
- Periodically review and alter impact management plans or activities;
- Verify the accuracy of past predictions of impacts and the effectiveness of mitigation measures, in order to transfer this experience to future activities of the same type; and
- Review the effectiveness of the environmental management.

Responsibility for the following points needs to be agreed before the project is given any approval to proceed:

- Undertaking and paying for monitoring;
- The management of the information gained from monitoring; and
- Implementation of any action that might be required as a result of the monitoring.

Monitoring is expensive. It needs to be aimed at the level required to successfully manage the project or review the adequacy of the EIA without wasting money by unnecessarily monitoring impacts. Monitoring should be focused on the impacts that are either significant or not well understood (requiring further analysis). It is not necessarily required for all impacts. The collection of information needs to be optimized so that enough is collected to be useful, but not so much that it is wasted. The monitoring program should also include action or emergency plans so that appropriate action can be taken in the event of adverse monitoring results or trends. It should be linked to impact prediction so that there is information on the impact nature, magnitude, geographical extent, timescale, probability of occurrence, significance, and prediction confidence (Bisset, 1988).

Objectives

The aim of the monitoring is to detect trends and changes so that remedial measures may be taken to achieve good environmental performance. Best practice monitoring for a site is determined by the physical and social factors involved. The environmental issues usually cover the environmental values to be protected, potential hazards, potential impacts, level of acceptable change, level of risk and the impact sites. Specific monitoring is often required for biophysical, socioeconomic, health and other factors.

Table K.1 Environment monitoring and performance assessment

Purpose	*Examples of available tools*
❑ Systematic approaches to business or organizational management	❑ Environmental management systems ISO 14000 series and BS 7750, quality assurance ISO 9000 series
❑ Assessing and designing environmentally sound projects and products	❑ Environmental impact assessment, risk assessment, life-cycle analysis, technology assessment, total environmental cost assessment
❑ Predictive analysis of individual impacts	❑ Specific and often highly technical techniques such as modeling of predicted noise levels or changed hydrological conditions
❑ Monitoring progress	❑ Testing specific parameters to a predefined plan and for a predefined purpose e.g. suspended solids, BOD etc for water quality

Purpose	*Examples of available tools*
❑ Audit, evaluation and review	❑ Often a 'one off' picture of the current environmental conditions used to indicate past or current status e.g. compliance audits, EIA audits, contaminated site audit, State of the Environment Reporting

Effective Monitoring Programs
Features of a monitoring program required to ensure effective information management should have:

- ❑ A realistic sampling program (temporal and spatial).
- ❑ Sampling methods relevant to source (point source, aerial, 3D).
- ❑ Collection of quality data.
- ❑ Compatibility of new data with other relevant data.
- ❑ Cost-effective data collection.
- ❑ Quality control in measurement and analysis.
- ❑ Innovations (e.g. in tracing contaminants and automated stations).
- ❑ Appropriate databases.
- ❑ Multi-disciplinary data interpretation to provide useful information.
- ❑ Reporting for internal management and external checks.
- ❑ Allowance for, and response to, input from third parties.
- ❑ Presentation in the public arena (external assessment).

Representation
Monitoring information once gathered is analyzed by assembling monitoring data in the form of maps, photographic records, data tables and graphs. Maps of the scale 1:5000 are normally sufficient for data presentation and a scale of 1:10,000 is adequate for catchment maps and general site maps. There is an increasing use of computers to analyze and present data and to check for ongoing compliance. Monitoring programs should provide time series data which can be analyzed from time series graphs. This can be done by:

- ❑ Visual qualitative assessment of the graphs;
- ❑ Testing statistical significance of variations;
- ❑ Determining rates and directions of change; and
- ❑ Noting the approach to, or exceeding of, critical levels (e.g. water quality guideline levels).

Monitoring Program Steps
The following steps in designing a monitoring program reflect these features of effective monitoring and are appropriate for a number of development proposals:

- ❑ Identify the scope of the monitoring and the aspects such as social dislocation, water quality, disease vectors etc that require monitoring;
- ❑ Define the objectives for the monitoring of each of these aspects;
- ❑ Decide how the information collected will be used in decision-making;
- ❑ Define the boundaries and select maps and plans, and sites for observation, measurement and sampling;
- ❑ Select the key indicators for direct measurement or observation;
- ❑ Define how the data will be analyzed and how the analysis will be presented;
- ❑ Make decisions on the level of accuracy required in the data;
- ❑ Consider how new data can be used to enhance existing data and make sure that it is in a format that will enable it to be used in conjunction with existing data;
- ❑ Establish a system for recording and responding to data (anecdotal or otherwise) provided by the community; and
- ❑ Set minimum requirements for monitoring of air, water quality, social change etc.

Environmental Performance
Because the monitoring program usually reflects the objectives of an impact management plan, data compiled can contribute to a systematic and comprehensive report on environmental performance. An annual cycle of reporting and review is often necessary to meet external regulatory requirements and to identify the need (if any) for further intensive studies or for remedial action.

Environmental Auditing
Environmental auditing is a review process similar to that carried out in financial auditing and can be done on a regular or irregular basis. It usually takes the form of an independent 'one off' examination and

assessment of past performance such as for the audit of a contaminated site. One special type of environmental auditing is the EIA audit which can provide an evaluation of compliance with the conditions of approval along with an assessment of the effectiveness of a particular EIA at predicting impact type and characteristics. Feedback from this type of audit can be used to improve the effectiveness and efficiency of other EIAs in the future. Environmental impact assessment auditing is a management tools that:

- Determines the actual impacts and outcomes of projects or decisions that have been subjected to an EIA;
- Assesses whether the conditions established by statutory bodies for mitigating the environmental impacts of developments have been implemented and enforced, and whether they ensured that the environment was protected;
- Identifies the nature and accuracy of impact predictions, and evaluates the role of impact prediction in the management of environmental impacts of developments;
- Evaluates the effectiveness of the EIA process in order to identify areas that could usefully be revised or refocused; and
- Examines the effectiveness of an individual EIA in an attempt to identify ways of improving the utility and efficiency of future assessments.

Auditing can also result in:

- An improved image for the product as environmentally sound;
- Reduction in public opposition to operations; and
- Avoidance of penalties which could result from non-compliance with stricter environmental controls.

Feedback

Findings of the audit and other less formal reviews need to be fed back into the monitoring plan and into management systems. In this way strengths will be highlighted, weaknesses acknowledged and remedied, and gaps in information required for effective reporting defined. Both the impact management plan and the monitoring program may need to be amended.

Parties Involved

Different stakeholders can be involved in different aspects of monitoring and follow-up activities. For instance:

- Responsible authorities make decisions on, and inspect or check implementation of, the terms of the conditions;
- Proponents or their agents are responsible for implementing the projects by monitoring the actual effects, implementing remedial measures, and verifying the accuracy of predictions;
- Environmental protection agencies as regulatory authorities check compliance with regulations, and verify the effectiveness of mitigation measures; and
- The public can be formally or informally involved in monitoring activities and may highlight inadequacies in monitoring programs. They may also have practical suggestions to help solve problems as they arise.

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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L. USEFUL EIA CONTACTS

LEBANESE GOVERNMENT MINISTRIES AND INSTITUTIONS OF RELEVANCE TO EIA

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http://www.moe.gov.lb/

Ministry of Public Works and Transport
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Ministry of Interior and Municipalities
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00100 Rome
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International Labor Office (ILO)
Focal Point for Environment and Sustainable Development
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The World Health Organization (WHO)
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Switzerland
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2. **Organization for Economic Co-operation and Development (OECD)**
   - Development Co-operation Directorate; and
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   both at:
   2 rue Andre Pascal
   75775 Paris Cedex 16
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   Telephone: 33 1 45 24 8200 Fax: 33 1 45 24 1996
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3. **Multi-National Aid Agencies and Development Banks**

African Development Bank
B.P.V. 316
Abidjan
Cote D'Ivoire
Telephone: 225 20 4199 Fax: 225 20 4907
Email: adbabjacos.gn.apc.org

Asian Development Bank
Office of the Environment
PO Box 789
1099 Manilla
The Philippines
Telephone: 632 711 3851 Fax: 632 741 7961
Email: www@mail.asiandevbank.org

European Bank for Reconstruction and Development
Public Infrastructure
Energy and Environment Department (1992)
One Exchange Square
London EC2A 2EH
Telephone: 44 71 338 6000 Fax: 44 71 338 6100

Inter-American Development Bank
Environment Division
Department of Social Programs & Sustainable Development
1300 New York Avenue
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Telephone: 1 202 623 1000 Fax: 1 202 623 3096
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2. Pollution standards: asomani@worldbank.org
3. EA implementation: rjedwood@worldbank.org
4. EA internal training: rrobelus@worldbank.org
5. EA external training: pharou@worldbank.org
6. EA Sourcebook Updates: okjorven@worldbank.org

For country & project specific EA summaries etc:
7. Public Information Center (PIC)
Room G, C1-310
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Electronic networks

Canadian Environmental Assessment Agency
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Department of Environmental Quality Promotion, Thailand
http://www.rectec.or.th/bureaux/moote.html

Department of the Environment, UK
http://www.open.gov.uk/doe/

Environment Australia
http://www.erin.gov.au/net/eianet.html

Hong Kong Environment Protection Department
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http://www.statkart.no/md

Ministry of the Environment, Singapore
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http://www.oecd.org

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For details or copies, refer to the Impact Assessment Center listed in section 4 of the EIA contact list.

EIA Center, University of Manchester *EIA leaflet series*

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