

**Profiles of Tools and Tactics  
for  
Environmental Mainstreaming**

**No. 1**

**ENVIRONMENTAL IMPACT ASSESSMENT (EIA)**

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([www.environmental-mainstreaming.org](http://www.environmental-mainstreaming.org))

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# ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

**Note:** We are grateful for review comments provided by Peter Nelson (Land Use Consultants, Bristol, UK)

<i>What is EIA for?</i>			<i>What issues does an EIA focus on?</i>	
Policy development			Environmental	√√√ (mainly)
Planning	√	Guides good decisions	Social	√ (sometimes)
Field work	√	For data collection	Economic	√ (sometimes)
Investment	√	For project approval	Institutional	√ (sometimes)
Assessment	√	Main focus		
Monitoring	√	Indicates what to monitor		
Campaigning				

## Purpose

EIA is intended to identify the impacts (both beneficial and adverse) of a proposed public and private development activities. Often, the focus is dominantly environmental (biophysical); but good practice also addresses social and economic aspects. EIA is mainly used at the level of specific developments and projects such as dams, industrial plants, transport infrastructure (eg airport runways and roads), farm enterprises, natural resource exploitation (eg sand extraction). Strategic environmental assessment (SEA) is a sister tool applied upstream at the level of policies, plans and programmes. Like SEA, EIA is most valuable when applied early in the planning process for a project as a support to decision-making. It provides a means to identify the most environmentally suitable option at an early stage, the best practicable environmental option, and alternatives to the proposed initiative; and thus avoid or minimise potentially damaging and costly negative impacts, and maximise positive impacts.

## Background facts

EIA was first introduced in the USA under the Environmental Policy Act (1969). Since then it has evolved and a variety of offshoot assessment techniques have emerged (focusing, for example on social, biodiversity, environmental health and cumulative effects and risk) acting as a broader impact assessment toolkit.

Most countries have now introduced formal EIA systems, usually under dedicated environmental legislation, and have introduced EIA regulations (and often regulatory bodies) specifying when and for which developments an EIA is required, institutional responsibilities and procedures, and specific steps and processes to be followed.

## Brief description of the main steps involved in application of the tool:

Key stages in the Environmental Assessment process include: screening, alternatives, preliminary assessment, scoping, mitigation, main EIA study and environmental impact statement, review and monitoring (Box 5.1 and Figure 5.1). These need to be managed so that they provide information to decision-makers at every stage of the project planning cycle (Figure 5.2).

### Box 1: Steps in EIA

(1) **Screening** (usually by an EIA Authority, or using published checklists) – to decide whether an EIA is required and focus resources on projects most likely to have significant impacts, those where impacts are uncertain and those where environmental management input is likely to be required. Official EIA guidelines usually contain lists or schedules specifying which developments require an EIA (eg always, or in particular circumstances).

(2) Consideration of possible **alternatives** (demand, activity, location, process & design, scheduling, inputs, 'no project') should be undertaken before a choice is made. Some projects can be site specific (eg in mining, extraction can only occur where a mineral is sited). In such cases the EIA might focus more on measures such as scale, mitigating measures and traffic management. Projects promoted by public sector agencies are more likely to consider alternative sites or routes for development than private sector initiatives where the early need to acquire options or purchase land strongly influences development location.

(3) **Preliminary assessment** - where screening suggests further assessment is needed or if there is uncertainty about the nature of potential impacts. Uses rapid assessment techniques, but provides sufficient detail to identify key impacts, their magnitude and significance, and evaluate their importance for decision-making. Indicates if a full EIA is needed. - involving the following steps.

(4) **Scoping** –a 'narrowing' process usually undertaken by an 'assessment team' to identify the key issues of concern at an early stage in the planning process and guide the development of terms of reference for the EIA. It aids site selection, identifies possible alternatives, and avoids delays due to having to assess previously unidentified possible impacts. Scoping should involve *all interested parties* such as the proponent and planning or environmental agencies and members of the public. The results determine the scope, depth and terms of reference to be addressed within an *Environmental Impact Statement* (see below). Once the site for development has been selected, the number of issues usually decreases and attention to detail increases.

(5) **Main EIA study** – building on and deepening the preceding steps to predict the extent and magnitude of impacts and determine their significance. A variety of methods can be used including: checklists, questionnaires, matrices, overlays, networks, models and simulations. The study should incorporate consideration of **mitigating measures** - reviewing the action proposed/taken to prevent, avoid or minimise actual or potential significant adverse effects of a project, eg abandoning or modifying a proposal, or substituting techniques using BATNEEC (Best Available Technology Not Entailing Excessive Costs) such as pollution abatement techniques to reduce emissions to legal limits. If the uncertainties are great, with the possibility of grave consequences and no mitigating measures then the proposed development should be rejected. If there are uncertainties that might be reduced by further studies, then an application can be deferred pending until further studies. Where mitigation is inappropriate, compensation may be an option.

An **Environmental Impact Statement (EIS)** is a comprehensive document that reports the findings of the EIA and now often required by law before a new project can proceed. A typical EIS, usually prepared by the project on behalf of the proponent (usually by consultants), focuses on the issues most relevant to decision-making. It can be broken down into three parts with different levels of detail:

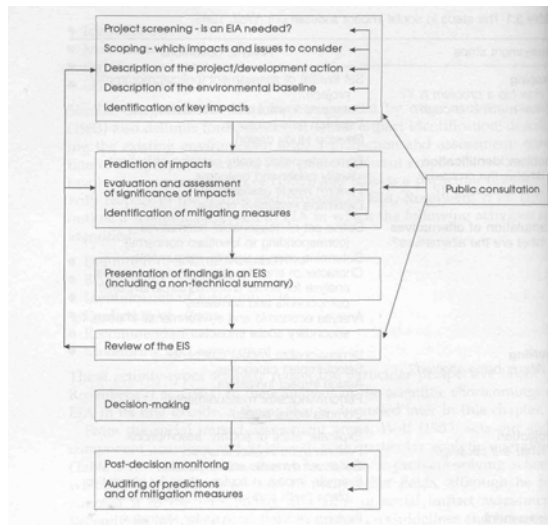
- Volume 1 - a comprehensive and concise document drawing together all relevant information regarding the development project;
- Non-Technical Summary (NTS) - a brief report of volume 1 in non-technical language that can easily be understood by the public;
- Volume 2 - a volume that contains a detailed assessment of the significant environmental effects.(not necessary when there are no significant effects either before or after mitigation).

Alternative communication approaches by also be appropriate where literacy or social/cultural barriers prevent local people accessing the EIS. (eg local language videos, presentations, radio programmes, meetings and workshops)

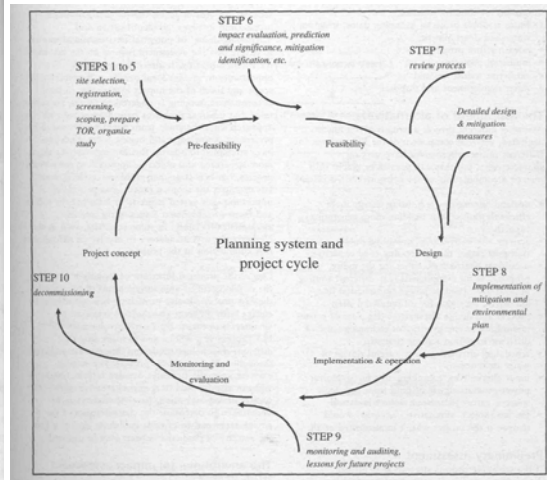
(6) **Review** – to assess the adequacy of the EIA to decision-making and consider its implications for project implementation (in some countries, such review is a formal and independent process)

(7) **Monitoring** of project implementation and operation (including decommissioning) , and eventually an **audit** of the project after its completion.

**Figure 1: The EIA process**



**Figure 2: The project planning cycle**



**Expected outputs**

- An Environmental Impact Statement that provides clear, understandable, relevant information to influence the final decision on the development project.
- A better development project (minimised negative impacts, maximised positive impacts, optimal location, best alternative selected, etc)

**Basic requirements**

For a major project, an EIA may take considerable time, manpower and resources. The first four stages (Box 1) are very important to determine the required extent and focus of the EIA.

**Data**

Prediction of impacts relies on data from a variety of sources: physical, biological and sociological. Its quality will often impose constraints on accuracy and reliability of predictions. Where data is limited, qualitative techniques will need to be used

**Cost** – usually less than 1% of overall project costs – the table shows example EIA costs for four World Bank projects.

Type of project	Cost of EIA (000, US\$)	Project cost (000, US\$)	% of total project costs
Thermal power generation, Ghana	250	400,000	0.06
Forest management, Tanzania	131	26,000	0.50
Energy sector development, Kenya	510	1,000,000	0.05
Energy sector development, Malawi	180	231,300	0.08

**Skills and capacity** – often a multidisciplinary team is required – particularly where scoping indicates the existence of multiple or complex issues.

### **Pros (main advantages) and Cons (main constraints in use and results)**

- EIA often focuses on biophysical issues (often a fault of poor terms of reference);
- Where environment, social and economic aspects are addressed, they are not always addressed in an integrated way (EIA reports tend to present as separate chapters)
- EIA provides an opportunity to learn from experience of similar projects and avoids the (often high) costs of subsequently mitigating unforeseen negative and damaging impacts.
- EIA Improves long-term viability of many projects

#### **Box 5.2: Case Study: EIA Mkuze River Crossing to Phelendaba, South Africa**

A relatively small EIA of a proposed road development in Maputaland, South Africa was conducted in 1999 for the South African Roads Agency, Department of Transport. The road formed a key infrastructural component of a Spatial Development Initiative aiming to provide a direct link between northern KwaZulu-Natal and Mozambique to encourage rapid investment and convert the area into an internationally competitive zone of economic activity and growth. The project aimed to tar the road, upgrade river crossings and construct a new crossing over a swamp. The undeveloped area dominated by subsistence agriculture had high levels of poverty and unemployment but high bio-diversity value and high eco-tourism potential.

An extended scoping study proved adequate for decision-making, despite the complexity of the issues. It proved unnecessary to undertake an intensive, detailed EIA that would have had significant time and resource implications.

The study involved extensive stakeholder participation. Because of the eco-tourism potential of pans in the area, the KwaZulu-Natal Nature Conservation Service (KZNNCS) proposed an alternative routing for the roadway (the western alignment), arguing that this would provide greater access to the Kwa-Jobe Tribal Authority – an extremely poor community.

The existing route was shorter and therefore cheaper, and most of its alignment was already cleared - so linear developments and other disturbances already existed. But it passed through a state forest with hazards to game and game hazards to traffic, opportunistic poaching and noise from the road.

The alternative western alignment required clearing 140 ha of mature Sand Forest and could open access to uncontrolled woodcutting. But benefits included expanding the width of a migration corridor between the Mkuze Game Reserve and the Sodwana State Forest. This route would also have eliminated the need to cross the Mozi Swamp.

The proposed upgrading of the swamp crossing would result in several positive impacts including removing barriers to fish migration, improving access to Kwa-Jobe, increase the frequency of water exchanges, reducing the hyper-salinity in Lake St Lucia and improved fish yields. Negative impacts included constricting water movement, possible embankment collapse during heavy floods and a reduction in hydrologic pressure on the Mkuze Swamp during floods.

The scoping study concluded that the eastern (existing) alignment was preferable especially given the vehement opposition expressed by Tribal authorities to the western (alternative) alignment. A stringent Environmental Management Programme (EMP) was recommended to govern all construction practises.

*Source:* Millard R and S le Hanie (1999). Mkuze River Crossing to Phelendaba, Environmental Scoping. Report Project SAPR S58-040-01/1. Johannesburg: Environmental Impact Management Services.

### **Key sources of further information and useful web-links**

Donnelly A, Dalal-Clayton D.B. & Hughes R. (1998): *A Directory of Impact Assessment Guidelines*. 2nd edition. Environmental Planning Group, IIED (available at [www.iied.org](http://www.iied.org)).

Petts J, (Ed) (1999). *Handbook of Environmental Impact Assessment* (2 volumes), Blackwell, Oxford

Wood C. (2003) *Environmental Impact Assessment : A Comparative Review*. 2<sup>nd</sup> ed. Prentice Hall, Harlow

Glasson, J; Therivel, R; Chadwick A, *Introduction to Environmental Impact Assessment*, (2005) Routledge, London

An index of useful EIA websites is available at: <http://www.iaia.org/eialist.html>

### **Acknowledgements**

IIED is grateful to Pter Nelson (Land Use Consultants) for helpful comments on a draft of this profile.