Environmental Impact Assessment in Australia

Theory and Practice

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1.2 The Need for EIA

The speed, scope and magnitude of effect on the natural environment are determined by the level of technology available to a community. Using human and animal power, and the energy of water, wind and fire with the relatively simple tools and machines that had been invented, the ancient peoples constructed monuments that still impress us. But, as Hughes comments, their level of interaction with the natural environment was relatively low compared with that of modern industrial society. The changes wrought by ancient civilisations have been massive, but took centuries or millennia to accomplish. Today more significant changes take place in months or years (or seconds in the case of nuclear explosions).

Of all the ancient peoples the Romans possessed the most highly developed technology, and in this respect were closest to us. Hughes comments that their machines for war, construction and industry foreshadowed some that are still used today. The fact that ancient peoples absorbed and survived successive changes in the technology of war and peace cannot be much comfort to us, as the rapidity, size and power of changes today are of an entirely different order of magnitude from anything experienced in ancient times.

Another factor determining the way a community will interact with the natural environment is the degree of organisation and control the community possesses. This is because environmental ends desired for the good of the community may involve sacrifices on the part of its individual embers, sacrifices that they would not make without some degree of social encouragement or coercion. In this context Hughes notes how ancient civilisations were able to exert a considerable degree of social control because the vast majority of ancient people regarded themselves primarily as part of their societies, and only secondarily as individuals. Each person had a place in the social hierarchy which was rigidly defined and rarely changed.

The problems of human communities affecting the natural environment did not begin with the ecological awakening of the 1960s, or with the onset of the Industrial Revolution, or in the Christian Middle Ages. People have had to find a way of living with nature from the earliest times, and many of our answers to that habitual challenge would have received their first discussion within ancient societies. However, the personal freedom inherent in 20th-century Western democracies coupled with technology enable us to have a considerable effect on nature, which may well affect others in the community or be out of step with what the community wants. To avoid such unwanted effects we have to develop ways to curb the excesses.

1.3 Before EIA

EIA is an approach developed to afford greater consideration to nature and the environment. While in concept and scope EIA is very different from previous approaches to considering the environment, it has evolved from an increasing interest in the environment (and an increasing level of government control). In particular, there are three fields that have provided a background for EIA.

1.3. 1 Pollution

Pollution has been with human society wherever large groups of people have assembled together, and inevitably some law has been developed to try to control the problem.

A municipal law under Julius Caesar prohibited all wheeled vehicles in Rome between sunrise and two hours before sunset so as to improve the situation for pedestrians. This law, Hughes notes, fell into disuse in the third century AD and Roman writers complained about the level of noise pollution generated by traffic in the streets. Ashby points out that more recently, in 1810, Napoleon issued a decree that divided noxious occupations into categories: those to be removed from habitation; those permitted on the outskirts of towns; and those tolerated close to houses.

This was an early form of land use planning aimed at reducing odour and air pollution in some areas of Paris.

Australia's first pollution regulations related to the protection of water quality in the Tank Stream, Sydney's only water supply for the first 40 years. Within the first five years of. settlement, regulations were passed to forbid the felling of trees within 50 feet (15 metres) of the stream. Powell comments that this was insufficient to protect water quality, and so Governor King proclaimed that if any person were found "throwing any filth into the Stream of fresh water, cleaning fish, washing, erecting pigsties near it ... on conviction before a Magistrate, their houses will be taken down and forfeit five pounds for each offence to the Orphan Fund" (p 35). A year later King also announced a fine of 5 shillings per tree felled within two "rods" (approximately 10m) of the water line of the Hawkesbury River in an attempt to protect the banks from flood erosion.

The modern day equivalent of these actions are the policies and regulations associated with environmental protection legislation. Throughout Australia and in most other countries, governments have established agencies to enforce environmental protection to manage air, water and land contamination.

1.3.2 Public Health

Early pollution legislation probably was as concerned with smell and appearance as with health, while recent legislation concentrates on the health aspect, pollution control regulations being an obvious example. But, as Cullingworth discusses, there was also a strong element of concern about health in early town-planning laws, through the separation of noxious industries, the provision of parkland, and the arrangement of streets to provide light and fresh air to houses. More particularly, Factory Acts in the 19th century and recent occupational health and safety legislation, which regulate working conditions, were designed to mitigate the worst excesses of exploitation of human resources through control of (some) aspects of worker health.

Twentieth-century "health" Acts have extended the philosophy of earlier legislation to establish further protection of the human "resource". At the beginning of the 21st century the link between human health and

environmental conditions was made explicit in the National Environmental Health Strategy.

1.3.3 Naturalists

In the late 191h century a number of North Americans expressed concern over the reduction in the area of forests and in the number of native nimals in the United States. Marsh's book *Man and Nature* helped to mobilise support for a greater concern for the natural environment, resurrecting the concept of stewardship. In the Australian context, Dingle records that "defenders of the bush" and "nature lovers" appeared on the Victorian scene through 1860 to 1880. Leisure time available to urban dwellers and the improved transport of the time helped people to develop an interest in nature.

As a result of this interest, and no doubt the increasing wealth of the country, the "national parks movement" developed, largely to protect areas of bush for the enjoyment of people. Over the last 100 years we have also seen the passing of legislation that recognises the value of plants and animals; that is, national parks Acts, forestry Acts, and Acts to protect particular plants and animals.

1.4 Evolving Assessment Practices

An appreciation of our cultural and philosophical history provides an understanding of the origins of EIA. There is no single reason for the development of modern society's increasing concern for the environment, or for the importance of the assessment of impacts. However, the important point is that these concerns exist, and have been brought together in the design of impact assessment procedures.

Much legislation relating to aspects of the environment, such as pollution, has been enacted. This can be read as indicating a general environmental awareness. The problem has been that while the awareness may be real enough, these environmental aspects have not been considered to have been a high priority, and they have been evaluated individually. The result has been that they have not then been compared on an equal footing with (particularly) economic issues. EIA is an attempt to redress this imbalance.

The theory and practice of impact assessment, especially EIA, are addressed in detail in the following chapters. However, it should be remembered that these formalised procedures will be effective only if there is the will to apply them.

Ultimately, if there is a willingness to think about the consequences of actions, before they are undertaken, formal procedures will not be necessary. In other words, impact assessment can be done by anyone, at any time. Individuals can always accept the responsibility of reviewing the effects of a proposal; they do not have to rely on regulations and bureaucracies.

As a result, the focus of the discussion is not so much the intricacies of the techniques that have developed to serve EIA, although these issues will be covered as they provide some useful guides for someone embarking on an assessment task. Rather, the main emphasis will be given to two issues which are the basis for the ways in which EIA, and other assessment processes, will be applied in future. First, the political nature of EIA will be a recurring theme. EIA is political in terms of the way

in which governments legislate for EIA, and the ways in which value judgments and political decisions, at the level of the individual, permeate virtually every element of EIA. Secondly, EIA, and assessment processes in general, is intrinsically simple and requires neither great intelligence nor sophisticated understanding. It follows that anyone should be able to take and apply the ideas. This is to be encouraged so that this skill can be applied to the wide range of decisions we make about policies, projects and proposals which can change the environment. If everyone were empowered to undertake such assessments, we would not need formal EIA procedures, and the environment would inevitably be given a higher status.

To assist this empowerment, the following material has been designed to be accessible to the interested reader. While the language and terms of EIA cannot be avoided, the relatively simple concepts of assessment processes should be readily apparent. For those who wish to delve into the intricacies of the processes, particularly E1A, the material provides guidance to reference materials and Internet sites.

7.4.2 Scoping the Contents of a Particular EIS

Scoping is a method finding favour to determine the issues to be investigated in the EIS. This process has the ability to identify what the EIS should contain, and the extent to which each issue requires attention. A judgment about significance (see section 7.1) is frequently required to decide whether an EIA is undertaken; for example, "works having a significant effect on the environment" (Department of Planning and Development). The point of the scoping stage is to identify the important items to be included in the EIS, as most attention is given to those environmental effects that may be significantly affected. Tomlinson lists the aims of scoping as:

(i) to identify concerns and issues requiring consideration;

(ii) to facilitate an efficient EIS preparation process;

(iii) to enable those responsible for EIA to properly brief the study team on the alternatives and impacts to be considered at different depths of analysis;

(iv) to provide an opportunity for public involvement;

(v) to save time. (p 186)

Simply stated, scoping involves the bringing together of the ideas, for the contents of the EIS, held by a variety of people in the community - the proponent, government, non-government organisations and interested individuals. Tomlinson discusses the concept of scoping in terms of some methods for developing the scope, or terms of reference, of the assessment, and the responsibilities of those involved in the EIA process. Scoping is evolving and there is little documentation about it, but Tomlinson points out that with involvement of the public, acceptable terms of reference can be developed and the likelihood of major controversy about the EIS is reduced. Scoping relies on the exchange of information and concerns between the interested parties through an appropriate organisation. According to United Nations Environment Programme (1997), scoping can be used to:

- 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.

The Terms of Reference for an EIA are, broadly, the outcome that would be sought from the scoping phase. These should clearly identify the work to be done and who is responsible for undertaking the stages of the EIA. Nonetheless, flexibility has to be built into the stages to allow the study to adapt to changes if necessary.

Tomlinson provides on overview of scoping procedures, many of which rely on some form of checklist. An example of this sort of list is ANZECC's (1996) *Guidelines and Criteria for Determining the Need for and Level of Environmental Impact Assessment in Australia.* (Table 7.1 and Appendix A reproduce these guidelines.) In essence, the guidelines provide a reminder to the person doing the scoping that there are many elements of the environment that potentially may be impacted upon. Answering the questions of the checklist with yes, no or maybe identifies those parts of the 'environment where there are likely to be impacts, thereby identifying those environmental effects which have to be covered in the EIS.

In section 8.3 examples of general checklists are presented which can provide a starting point for scoping, or thinking about the important elements of the EIS. More specific checklists have been developed for application to particular types of proposals, such as hydroelectric power plants, main roads and community facilities. Gilpin provides a comprehensive overview of the range of these checklists and their contents.

A potentially useful approach for determining the environmental factors to be included is the identification of Valued Ecosystem Components. Sadar explains that these can be drawn from the ecological context of the proposal, and those aspects perceived by the public to be important. Aspects to be considered include:

- the ecosystems that exist and their functional relationships;
- the carrying capacity of the bio-physical or social environment;
- the resilience of the environment when exposed to various stresses;
- the weakest links in the systems; the sensitivity of the environment to stress;
- the level of biodiversity in the ecosystem.

To determine the valued components Sadar identifies a number of questions to be

answered. These are closely related to the extent to which the components are considered to be important from the point of view of the law, the public, politics, the economy, the scientific and professional communities.

Clearly decisions about what is valued will depend on the experiences of those involved. In general, experience is at the base of most of the techniques that have been developed to assist with scoping. The personal and professional experience of the person planning the EIS is always going to be a starting point for development of the scope. This experience can be expanded by including the input of colleagues, and by calling on the experience of relevant experts. The content of previous EISs, for similar proposals, is another source of guidance along with that from the checklists discussed earlier.

Another approach, which may be used in conjunction with experience and checklists, has been used in several EIA procedures across Australia since the early 1980s. Preparation of EISs have frequently begun by the proponent publicising the intended contents of the study (and document), seeking suggestions from interested parties. Comment from relevant government agencies and community and conservation organisations has also been sought to help determine the range of issues. Since the late 1980s scoping, or consultative, committees have been established for some EIAs so that community representatives could directly participate in development of the elements of the investigation (see sections 4.5.3 and 6.10.1 for the experience in Victoria).

Boundaries are also an essential element of scoping. Sadar comments that this entails setting limits to what is to be included in subsequent steps in the assessment. Common sense and practical considerations guide the process which should:

- focus on the most important issues;
- limit the amount of information to be gathered to manageable levels;
- be able to propose realistic mitigative and monitoring measures.

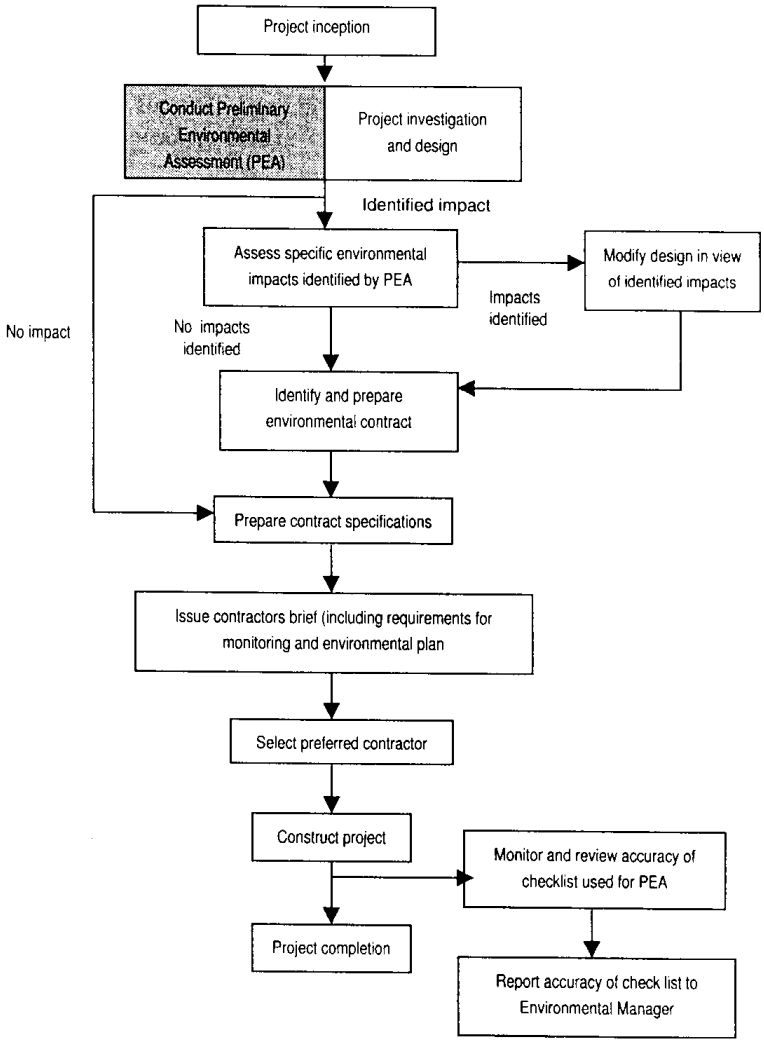
He also suggests that the relevant boundaries relate to spatial, temporal and jurisdictional limits. As importantly, the ecosystems and social components to be excluded should be identified along with those that will be included in the EIS.

10.4 Assessment Activity Outside the Formal Processes of Government

In discussing the current directions of assessment (see section 2.3) we looked briefly at the extension of EIA into the internal planning processes of organisations (businesses, corporations, local governments, non-government groups, and the like). These organisations are not relying on the formal government procedures, such as those outlined in Chapter 6, to tell them when an environmental assessment is needed. Rather they have developed "in-house" arrangements to identify when their activities may have environmental impacts, and the safeguards needed to reduce significant impacts. Encouragement for the development of informal arrangements is given by the increasing adoption of Environmental Management Systems (see section 10.5) where the organisation has to identify the environmental impacts that result from its operations. Yet other organisations have developed their approaches to satisfy internal environmental requirements.

As an example of an informal EIA procedure, City West Water uses a Preliminary Environmental Assessment (PEA) that is integrated into its overall management procedures (see Figure 10.2). The substance of the PEA is:

Figure 10.2 – City West Water Management Procedures with Integrated Environment Assessment



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- communities, and typical environmental matters like amenity and air quality;
- a tabular checklist that identifies issues associated with specific environmental matters, such as sites of identified floral significance;
- an Environmental Assessment/Summary sheet which itemises: a description of the project; options considered; description of environmental impacts and costs; evaluation process and expert advice obtained; actions to minimise impacts and further actions; formal approvals required; consultation process - this sheet ends with an assurance statement that all reasonable steps have been taken to recognise and reduce impacts, and is signed by the Project, Business Function and Environmental Programs Managers.

The emphasis of this assessment process is the projects that are initiated and developed by City West Water. A similar form of informal EIA has been considered by the City of Melbourne to identify environmental impacts arising from the decisions made by the council regarding planning applications (Leeson, 2000). These applications relate to projects that are initiated by individuals and organisations with no connection to the City, and where there may be implications for the overall environmental quality of the council's area (such as the implications for energy use and Greenhouse gas emissions of allowing residential development that is not based on public transport). Here a process based on general checklists has been tested, alongside a process similar to that of City West Water to assess the impacts of projects initiated by the council (eg road construction).

In addition to informal processes that provide for the direct assessment of environmental impacts, and which largely follow very similar stages to formal EIA procedures, over the last decade several procedures have evolved to identify environmental impacts. Often these are used along side other procedures, or are associated with broad environmental management and associated systems (particularly discussed in section 10.5).

Like EIA, the concept of life cycle analysis (LCA) has developed from the need to take a holistic view of a project or activity, but with particular emphasis on industrial activity. LCA has been applied to industrial processes, such as the production of steel, to determine the environmental implications of all stages of the process. According to Flood, the analysis is a means of assessing the effects of a business's products aswell as the effects of obtaining the raw materials and components purchased from suppliers. Hence, LCA would take into consideration the impacts of procuring the basic materials (eg mining), transport, manufacture, distribution and, ultimately, disposal of the used items.

Rubik notes that another term for LCA is the "eco-balance approach", which has been used in a number of contexts: the eco-labelling of products; eco-marketing of products; design of new products; investment and purchasing decisions; determining future development strategies; and designing environmental policy instruments. In all these situations the desire is to be able to provide an overview of the impacts to guide decisions-makers, whether they be shoppers deciding to buy a product, directors choosing between production processes or bureaucrats considering planning alternatives.

As with other forms of impact assessment, the difficulty with LCA is in defining what

is to be included in the analysis and obtaining relevant data. In this vein, Rubik has identified several areas requiring further research: scope of the study; system description; comparison of alternatives; quality and comparability of data; and appropriate aggregation and validation methods.

Unlike EIA, the assessments undertaken within the framework of LCA are not currently required by legislation, nor are they always available for investigation by the public. Nonetheless, the LCA "tool" is essentially a procedure for assisting decision-making, and ensuring that environmental considerations are a main aspect. As with EIA, there is no way of ensuring that the environmentally best activity is undertaken, but LCA has the potential for alerting designers and planners to environmental considerations, and highlighting the impacts of particular decisions. Consequently, it has a strong educational element, which could ultimately lead decision-makers to aim for reductions in resource consumption and pollution loads.

In this respect LCA, and the broad philosophy of EIA, have a close association with the notion of cleaner production. Cleaner production is "the continuous application of an integrated preventative environmental strategy to processes and products so as to reduce the risks to humans and the environment" (United Nations Environment Programme, p 2). However, no matter what title is given to the processes, each involves the basics of EIA, being to identify the environmental issues (eg use of resources, or pollution), forecast the impacts, consider alternatives and present the information in a way that aids the decision-makers.

An initial stage in cleaner production and similar assessment procedures is that of environmental auditing. The Institute of

Environmental Assessment comments that environmental auditing has emerged as an important instrument for environmental protection. This is the term "given to the process for evaluating the environmental impacts during the operational phase of existing developments" (p 5). Now there are individuals accredited as environmental auditors, but the process of an audit is fairly clear and is discussed in many manuals and texts, such as those published by the International Chamber of Commerce. Auditing typically involves three steps: pre-audit activities (obtaining background data); activities at the site (observation of what is happening and discussions with operational personnel); and developing the report with its action plan.

In many respects, auditing complements EIA. While EIA typically focuses on the potential environmental effects during the planning stage, before operations begin, environmental auditing undertakes a monitoring role during the operational stages, to provide feedback for improvement. According to the Institute of Environmental Assessment, links between EIA and environmental auditing should become firmly established within the next decade, providing an "integrated approach to facility steward-ship" (p 5). In other words, EIA coupled with environmental auditing support the principles of sustainable development.

Our impact assessment team in Australia and New Zealand (ANZ) comprises highly regarded professionals with a proven track record in managing a broad range of complex multidisciplinary environmental impact assessments. We are trusted experts in our field, both domestically and globally. Our team brings extensive and diverse experience, with careers spanning from two to 45 years in the management of environmental projects across all major and emerging sectors Environmental Impact Assessment approvals. Home. About Antarctica. Environmental management. Environmental Impact Assessment approvals.Â If you are an Australian citizen, organisation or expeditioner that wishes to conduct scientific, management or recreational and other non-government activities in the Antarctic or sub-Antarctic you will need to be aware of and comply with all national and state legislative requirements. The information contained within this section is provided as general guidance only on the environmental protection requirements under Australian law. You will still need to ensure that you are aware of all other legal requirements and that these have been satisfied before you depart for the Antarctic or sub-An 5.11 There was some concern about the lack of national standards in environmental impact assessment, in part, a consequence of having different EIA laws and processes across all jurisdictions. Dr Alexander Webster, the Chief Executive of the Institution of Engineers, suggested to the Committee that there should be clear understanding between jurisdictions over environmental matters and that national standards for environmental management should be compatible internationallyÂ The Commonwealth should use its powers to adopt national standards for environmental impact assessment of a project proposal likely to have a significant impact on biological diversity in Australia. National approvals -- requirements and standards.