ENVIRONMENTAL IMPACT ASSESSMENT IN DEVELOPING COUNTRIES: AN OVERVIEW

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Abstract

Developing country environmental impact assessment (EIA) dates back to the mid-1970s and, although it varies significantly from country to country, its performance generally falls far behind that of EIA in developed countries. It is crucial that this performance be improved in order to help to protect the environment of three quarters of the world's land area. This paper reviews developing country EIA against a set of robust evaluation criteria to determine its strengths and weaknesses. These relate to: legal basis; coverage; consideration of alternatives; screening; scoping; EIA report preparation; EIA report review; decision-making; impact monitoring; mitigation; consultation and participation; system monitoring; costs and benefits; and strategic environmental assessment. Because developing country EIA meets so few of the 14 evaluation criteria, several urgent generic issues need to be addressed if EIA is to fulfil its potential. These include legislation, organisational capacity, training, environmental information, participation, diffusion of experience, donor policy and political will.

Introduction

There is a danger that the advances in environmental protection and enhancement achieved through the use of EIA in developed nations will prove inadequate on a global scale unless a similar level of attention is given to the application of EIA in developing countries. About 110 low- and middle-income countries occupy 76% of the world's land area and contain 93% of its population but enjoy only about 19% of the world's 135 countries' gross domestic product (World Bank, 1997b; Lee and George, 2000, 2). In an era of rapid industrialization and population growth in some of these regions, and increasing recognition of the regional and global environmental impacts of certain development projects, the need to apply EIA in these countries effectively is apparent. Ebisemiju (1993) bemoaned the lack of developing country EIA systems but about two-thirds of the approximately 110 developing countries had enacted some form of EIA legislation by the mid-1990s (World Bank, 1997b; Donnelly et al., 1998; Glasson et al., 1999). Sadler (1996, 31) described this as, "…perhaps one of the most striking and possibly under-appreciated trends in the field".

This paper is concerned with reviewing the strengths and weaknesses of EIA in the 110 developing countries identified by the World Bank (1997b). Its objective is to indicate the weaknesses in current EIA practice and to suggest ways in which these might be overcome. This is crucial if performance is to be improved in order to help to protect the environment of three quarters of the world's land area.

Apart from reviewing the growing documentary and electronic literature (including many 'grey' literature documents), the interview was the main research method employed in this study. About 100 interviews were conducted with international agency officials and with government and agency officials, researchers in universities and research establishments, representatives of industry, lawyers, consultants and pressure group campaigners in Albania, Chile, the Czech Republic, Egypt, India, Jordan, Lesotho, Malaysia, South Africa, Swaziland, Tanzania and Zimbabwe over a seven year period. A structured approach was employed, interviews being conducted using questions derived from a set of evaluation criteria (below). Wherever possible an attempt was made to overcome potential inaccuracies by cross-checking participants' accounts with those of other participants in the EIA process and with documentary evidence. Drafts of parts of earlier versions of much of the material in this paper were reviewed by some of those interviewed. Generally, the approach adopted was in close accord with the principles for conducting EIA evaluations enunciated by Sadler (1998).

The next section of the paper discusses the evolution of developing country EIA systems. This is followed by a brief discussion of the use of evaluation criteria to analyse the main procedural features of EIA systems. The main part of the paper is concerned with the evaluation of the performance of EIA. Finally, conclusions are drawn and suggestions are made as to how EIA performance in developing countries can be improved.

Evolution of developing country EIA systems

Several international agencies have involved themselves with EIA. The Organisation for Economic Cooperation and Development (OECD) recommended that member governments adopt EIA procedures and methods in the process of granting aid to developing countries (OECD, 1992). In 1989 the World Bank ruled that EIA for major projects should normally be undertaken by the borrower country under the Bank's supervision. (The World Bank (1999) has recently updated its guidance on EIA.) The United Nations Environment Programme (UNEP) also made recommendations to member states regarding the establishment of EIA procedures and established goals and principles for EIA. It subsequently issued guidance on EIA in developing countries (UNEP, 1988). The 1992 Earth Summit provided additional momentum to these developments. Principle 17 of the Rio Declaration (in Sadler, 1996, 24) stated 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.

EIA is now practised in more than 100 countries world-wide (Donnelly et al., 1998).

Just as there are huge differences in EIA systems in the developed world, so there are between EIA systems in developing countries. Thus, there are enormous variations between the situations in central and eastern Europe (where some countries have implemented the European directive on EIA in readiness for accession to the European Union (Donnelly et al., 1998)), in Latin America and SE Asia (where many countries have developed EIA systems of varying effectiveness (Lohani et al., 1997; Donnelly et al., 1998)), and in Africa (where some have no EIA system (Kakonge, 1999)). Just as in Europe, however, the situation in different countries within continents varies considerably. Within Africa, for example, while the South African EIA system has many of the attributes of a sophisticated developed country EIA system (Wood, 2002) and EIA is becoming important in Ghana (Appiah-Opoku, 2001), as yet EIA is unimportant in Somalia. George (2000a, 35) gave a number of reasons for the variation in the extent, regulatory form and practical application of EIA in different

developing countries. These included "…resources, political and administrative systems, social and cultural systems, and the level and nature of economic development."

Despite these variations, it remains true that, on the whole, EIA in developing countries tends to be very different from EIA in the developed world. The most conspicuous difference relates to the fact that the first EIAs to be carried out in developing countries were usually demanded by development assistance agencies on a project-by-project basis, not as a response to a widespread indigenous demand for better environmental protection. However, Lohani et al. (1997) noted that the emergence of the sustainable development agenda was also an influential factor in the development of some Asian EIA systems.

Lee and George (2000, xi) noted that, in general, EIA has been introduced later and is less firmly embedded in the development process in low and middle income countries than in developed countries. Despite the legislative EIA requirements in, for example, Columbia (1974) and the Philippines (1977) pre-dating those in many developed countries, it is only over the past decade that many developing countries have established their own formal legislative bases for EIA (Donnelly et al., 1998). There are now many examples of EIA being undertaken in developing countries, by no means all as a result of donor agency pressure (Biswas and Agarwala, 1992; Hildebrand and Cannon, 1993; Sadler, 1996; Lohani et al., 1997; Briffett, 1999; Modak and Biswas, 1999; Glasson et al., 1999; Lee and George, 2000). These include EIAs in Brazil (Glasson and Salvador, 2000), Chile (de la Maza, 2001), China, Columbia, Egypt (Ahmad and Wood, 2002), Ghana (Appiah-Opoku, 2001), India (Banham and Brew, 1996; Ramanathan and Geetha, 1998; Selvam et al., 1999), Indonesia (Boyle, 1998), Lebanon (el-Fadel et al., 2000), Lesotho (Mokhehle and Diab, 2001), Malaysia (Memon, 2000), Pakistan, the Philippines (Lohani et al., 1997), South Africa (Wood, 2002), Sri Lanka, Swaziland, Tanzania (Mwalyosi and Hughes, 1997), Thailand (Boyle, 1998), Turkey (Ahmad and Wood, 2002) and Zimbabwe (Adger and Chigume, 1992).

Evaluation of EIA procedures

Much of the debate about the effectiveness of EIA centres on the factors that can be advanced to explain why EIA systems are effective, on which evaluation criteria are appropriate in judging the effectiveness of an EIA system and on how EIA can be improved (Glasson et al., 1999; Wood, 2002). Kennedy (1988, 262) concluded that "…EIA works best when … there is a specific legal requirement for its application, where an environmental impact statement is prepared, and where authorities are accountable for taking its results into consideration in decision-making". He emphasised that, for EIA to be successfully integrated

in the project planning process, "…procedures for screening, scoping, external review and public participation need to be a part of it".

While it is difficult to reach an objective overall judgement about any EIA system, there is a need for an evaluative framework for comparing the formal legal procedures, the arrangements for their application, and practice in their implementation in EIA systems. Various approaches for evaluating EIA systems have been advanced (for example, by Hollick (1986), Gibson (1993), Sadler (1996, 22) and Annandale (2001)). Evaluation criteria are, in effect, shorthand versions of principles for EIA and, carefully articulated, have considerable advantages in terms of brevity and clarity.

Table 1 presents a set of evaluation criteria that is based upon the stages in the EIA process (including the consideration of alternatives, project design, screening, scoping, report preparation, review, consultation and public participation, mitigation, decision-making and monitoring of project impacts), the aims of EIA, and the various evaluation frameworks advanced (Wood, 2002). The focus of the criteria is on the requirements and operation of the EIA process, i.e. mainly on procedural effectiveness, though they also encompass efficiency and equity considerations (Sadler, 1998). Assessing the substantive dimension, the effectiveness of EIA in delivering its desired outcome, the enhancement of environmental protection, is a different, and ultimately more difficult task. Consequently, only the penultimate criterion involves an overall comparison of the costs and benefits of EIA, relying mainly on the opinions of those involved in the EIA process. The 14 criteria can be employed to judge the effectiveness of any EIA system.

Table 1. Performance of developing country EIA systems

Criterion	Criterion Met	Comment
1. Is the EIA system based on clear and specific legal provisions?	No	Legislation rarely specifically provides for clearly defined EIA process integrated into other decision-making procedures.
2. Must the relevant environmental impacts of all significant actions be assessed?	No	Highly significant projects often covered but EIA not always implemented. Some direct and cumulative environmental impacts not covered.
3. Must evidence of the consideration, by the proponent, of the environmental impacts of reasonable alternative actions be demonstrated in the EIA process?	No	Alternatives, including the 'no-action' and the environmentally preferable alternatives, are often not considered.
4. Must screening of actions for environmental significance take place?	Partially	Lists of activities, thresholds and criteria often allow considerable discretion.
5. Must scoping of the environmental impacts of actions take place and specific guidelines be produced?	No	Scoping, especially involving public, rare.
6. Must EIA reports meet prescribed content requirements and do checks to prevent the release of inadequate EIA reports exist?	No	EIA reports often designed to meet development assistance agency requirements. Few checks exist.
7. Must EIA reports be publicly reviewed and the proponent respond to the points raised?	No	EIA report review is weak but improving. Rare for proponents to respond to points raised. Public often not involved.
8. Must the findings of the EIA report and the review be a central determinant of the decision on the action?	No	Although EIA theoretically influences decision, in practice this is rare.
9. Must monitoring of action impacts be undertaken and is it linked to the earlier stages of the EIA process?	No	Few specific requirements relating to monitoring and comparison with conditions exist. Practice infrequent.
10. Must the mitigation of action impacts be considered at the various stages of the EIA process?	Partially	Mitigation is the most important element of EIA in developing countries but implementation practice often unsatisfactory.
11. Must consultation and participation take place prior to, and following, EIA report publication?	No	Formal requirements for consultation and public participation in both scoping and review are almost always absent.
12. Must the EIA system be monitored and, if necessary, be amended to incorporate feedback from experience?	No	EIA system monitoring almost completely absent but modifications to EIA procedures take place as experience gained or under development assistance agency pressure.
13. Are the financial costs and time requirements of the EIA system acceptable to those involved and are they believed to be outweighed by discernible environmental benefits?	No	Probable majority belief that financial and time costs of EIA outweigh its benefits.
14. Does the EIA system apply to significant programmes, plans and policies, as well as to projects?	Partially	Some SEA practice as a result of development assistance agency encouragement.

If an EIA system fails to meet a significant proportion of evaluation criteria, it not only falls short of recognised international good practice but cannot deliver its intended environmental protection benefits. In this review the performance of the 'average' developing country EIA system is judged against each criterion and suggestions for improvement are made. It is vital to appreciate that there will always be exceptions to the inevitable generalisations involved in forming the judgements summarised in Table 1.

Legal basis of EIA systems

It is now well established that legislation is the essential pre-cursor to an effective EIA system, in developing countries just as it is in developed countries (Wood, 2002). However, the legal basis of EIA systems in many developing countries may be weak, non-mandatory or non-existent. For example, EIA is not mandatory in many African countries and the enactment of appropriate legislation there is now almost universally regarded as a crucial first step (Kakonge, 1999). While about 70 developing countries have enacted some form of EIA legislation (above), this usually forms one part of a general environmental law rather than being EIA-specific (Sadler, 1996). A common weakness of legal provisions for EIA in developing countries is that they are often expected, unrealistically, to resolve environmental problems resulting from the absence of, or shortcomings in, environmental planning and pollution control systems. An up-to-date data-base of EIA laws and regulations in developing countries would prevent the 'reinvention of the wheel' when preparing new EIA legislation.

Glasson et al. (1999, 352) identified weaknesses in many developing country's institutional structures to implement EIA. The organisations responsible for implementing EIA provisions in developing countries are frequently new, lacking in status and political clout, and working in a culture where an absence of information sharing considerably reduces their influence. Environment ministries are often 'bypassed' by other, more powerful, ministries. This lack of organisational capacity explains why EIA largely remains a 'top-down' requirement imposed by external agencies (Rayner, 1993). As in the developed world, it is clearly desirable to put in place not only the legal requirements for EIA but sufficient institutional and personnel capacity and resources to implement them effectively (Biswas, 1992). Fortunately, the development assistance agencies are turning their attention to the need to create not only the legal and institutional framework to administer EIA but to local centres of EIA expertise.

Coverage of EIA systems

The coverage of EIA systems in developing countries is markedly patchy in relation both to the projects covered and to the impacts assessed. In some developing countries, EIA systems are put in place purely to satisfy the development assistance agencies. In others, there may be little indigenous demand for EIA and it may therefore be applied only to grant-aided projects. This may be one reason why Bisset (1992, 217) reported that fewer EIAs are undertaken in developing countries than would be anticipated from the relevant legal and other requirements. It is not uncommon for certain impacts to be neglected in some developing country EIA reports (for example, landscape and visual impacts are not included in the Indian EIA regulations). Lohani et al. (1997) reported that the treatment of cumulative impacts in Asian EIA systems was unsatisfactory, a finding that frequently applies to developing country EIAs.

It appears generally to be accepted that social as well as environmental impacts should be included in developing country EIAs and that positive as well as negative impacts should be emphasised (World Bank, 1991; Biswas, 1992; OECD, 1992). Each developing country EIA system should be designed to cover all the types of actions which have the potential to cause environmental damage in the local circumstances: there is no universally applicable model.

Consideration of alternatives

The consideration of alternatives in developing country EIAs is frequently weak. The no-action alternative is often not a viable choice in circumstances where the alleviation of poverty and starvation may be the predominant goal and, in practice, the environmentally preferable alternative may not be considered either. Bisset (1992, 217) suggested that the selection of the most environmentally favourable alternative was rarely achieved at an early stage of the project planning cycle in developing country EIA. However, the choice of an alternative which minimises damage to the environment is, in principle, as achievable in developing countries as in developed countries.

Screening of actions

The screening of actions for the applicability of EIA is not undertaken satisfactorily in many developing countries. In practice, screening in developing countries is weak because environmental agencies have little power, but overseas development agencies can be influential in insisting that EIA is undertaken to meet their aid requirements (Wood, 2000).

For example, the World Bank's (1999) good practice statement included a list of projects that will usually require environmental assessment. However, the list is discretionary because ultimately it is the significance of the impacts, and not the type of project, that determines whether EIA is necessary or not, and what type of EIA should be employed. Briffett (1999, 160) reported that screening criteria based on the sensitivity of the site worked better in east Asia than those based on the size of projects. In countries with the least advanced EIA systems, the inclusion or exclusion of a project may be at the discretion of senior government officials, with the degree of flexibility and discretion reducing as EIA systems become more entrenched (George, 2000a). A hybrid approach to screening, involving the use of a combination of lists and thresholds together with an element of discretion, tends to be most common (Wood, 2000). Unfortunately, development assistance agency EIA procedures designed for large and complex infrastructure projects are often applied to the assessment of smaller, more routine, projects.

To ensure that projects with significant impacts are assessed, and to avoid squandering scarce resources on the EIA of projects with minor impacts, it is even more essential in developing countries than in developed countries to have a simple and effective screening system, incorporating the use of simplified EIA for appropriate projects, in place (Jones, 1999). Increasing the coordination between the different development assistance agency EIA requirements would facilitate this. The development of unambiguous national screening lists and criteria in accordance with these donor requirements, with guidelines on their use, would improve screening practice in developing countries. Aid agencies can encourage proponents to provide the appropriate information for effective screening.

Scoping of impacts

It is generally agreed that scoping is as important a step in EIA systems in developing countries as in developed countries (Ahmad and Sammy, 1985; Bisset, 1992; OECD, 1992; Jones, 1999). It is, however, frequently missing, at least in so far as public consultation is concerned. Wood (2000) suggested that scoping is usually better utilised where it is a requirement of development assistance agencies such as the World Bank (which requires scoping as a condition of funding (World Bank, 1999)). George (2000a) noted that, where scoping does take place, it is often directed towards meeting developing country pollution control requirements, rather than addressing the full range of potential environmental impacts from a proposed development. Few EIAs in developing countries appear to be produced with the assistance of project-specific guidelines (World Bank, 1997a; George, 2000b). There is a

need to use interdisciplinary teams with indigenous expert input to overcome these difficulties.

EIA report preparation

EIA reports in developing countries are often confidential (Bisset, 1992). In particular, EIA reports are not user-friendly and were weak on alternatives, scoping, prediction, the attribution of significance, and the justification of proposals (Lee, 2000b). Some EIA reports in India have been bound like PhD theses, have been similarly indigestible, have been produced with similarly limited numbers of copies and have not even been available through inter-library loan (Banham and Brew, 1996; Selvam et al., 1999). To date, very few EIA reports have been made available to the public (or even for training purposes) in Egypt (Ahmad and Wood, 2002). Many developing country EIA reports are written in English, rather than in the endemic language, and seldom make concessions to the few lay readers able to review them. This is hardly an appropriate climate for EIA peer and public review.

There are several prominent difficulties in developing countries in relation to EIA report preparation:

1. There is a lack of trained human resources and of financial resources that often leads to the preparation of inadequate and irrelevant EIA reports in developing countries (Clark, 1999).
2. Environmental conditions in tropical or near-tropical areas render many of the environmental assumptions, models and standards derived in temperate zones inappropriate (George, 2000b).
3. Baseline socio-economic and environmental data may be inaccurate, difficult to obtain or non-existent in developing countries (Wilbanks et al., 1993).
4. The significance attached to particular environmental impacts may be either much less or much greater (especially where cultural effects are involved) in developing countries than in developed countries (Boyle, 1998).

Various means of addressing each of these four difficulties have been suggested.

First, the importance of assembling an appropriate interdisciplinary team to prepare EIA reports in developing countries has been stressed (United Nations Environment Programme - UNEP, 1988; Wood, 2000). In the past, many agencies have failed to recognise the importance of ensuring that skilled EIA personnel exist in environmental consultancies and research institutes in developing countries. George (2000b) and Kennedy (1999, 120)

have suggested that this local environmental experience should be more extensively utilized in the preparation of EIA reports to improve prediction practice. Abaza (2000) noted that, as EIAs in developing countries are often planned and undertaken by international consultants, the opportunity for capacity building in these countries is diminished. In addition, because international consultants may not be fully independent and may be constrained by fixed budgets, the exploratory nature of EIA might be compromised.

Second, there is a need to employ EIA methodologies appropriate to conditions in developing countries. George (2000b) stressed that factors such as climate, ecology, population density and social structure influence the choice of impact prediction techniques, the evaluation of significance and the design of mitigation measures in EIA. The danger of transposing methods and techniques used within the EIA systems of western nations without adaptation is therefore apparent. Biswas (1992, 240) blamed the use of inappropriate, imported, methodologies for EIA reports which are "too academic, bureaucratic, mechanistic and voluminous". George (2000b, 106) noted that prediction practice in low income countries is weak: "[t]here is often excessive reliance on expert opinion, with little use of more objective techniques or substantiating arguments". The World Bank (1991), the Overseas Development Administration (ODA, 1992), OECD (1992) and the Commission of the European Communities (1993a) have all produced valuable guides. In many ways, however, the principles enunciated by UNEP (1988) remain the clearest:

1. Focus on the main issues.
2. Involve the appropriate persons and groups.
3. Link information to decisions about the project.
4. Present clear options for the mitigation of impacts and for sound environmental management.
5. Provide information in a form useful to the decision-makers.

Methodologies, techniques and standards should be selected with the observance of these principles as the primary objective (UNEP, 1988).

Third, while the absence of reliable baseline data in developing countries is a hindrance, more data often exist than most people appreciate (Wilbanks et al., 1993). However, problems of poor or non-existent data retrieval and management systems (Briffett, 1999), inter-ministerial and/or inter-institutional rivalry, unnecessary classification of data as secret or confidential and inaccuracy of data, need to be overcome (Biswas, 1992). Improving the practice of EIA in developing countries demands that developers, consultants and, especially, government environment departments acquire and share both new and existing

environmental information to a greater extent than in the past (McCormick, 1993). Training, personal motivation and public pressure are the main keys to unlocking data sources in developing countries. Data collected by overseas organizations are an increasingly valuable resource as, ironically, it is often easier for an external expert to gain access to environmental data than an indigenous one. To overcome some of these problems, the World Bank (1995) has suggested that use of geographic information systems can be an effective and economical way of storing and presenting the data needed to undertake EIA.

Fourth, the different significance attached to impacts in different countries (Boyle, 1998), together with the lack of relevant baseline data (above), are two of the strongest reasons for ensuring that indigenous experts undertake EIA and that local people participate in the EIA process (Donnelly et al., 1998; Clark, 1999). Local people can assist not only by helping to determine significance but also by providing baseline environmental data.

EIA report review

Arrangements for the review of EIA reports vary widely between developing countries because of the differences in their administrative structures and consultation procedures (George, 2000a, 51). The review stage of the EIA process appears to be poorly undertaken in some developing countries (e.g., Egypt (Ahmad and Wood, 2002)) and to be missing altogether in others. Unsurprisingly, the quality of the limited number of developing country EIA reports subjected to independent review has generally been of a lower standard than in western nations (Lee, 2000b). There is real opportunity for improvement (Lee, 2000a). The initiative to set up the Southern African Institute for Environmental Assessment as an independent advisory body, similar to those in the Netherlands and the UK (Glasson et al., 1999), to overcome the staffing shortages which make effective scoping and review difficult in the countries of the region points to one way forward.

Decision-making

Decision making on projects may be made both by development assistance agencies and by governments, is frequently closed to external scrutiny, and may be influenced not only by economic and social factors but also by corruption (Boyle, 1998; Donnelly et al., 1998). Lee (2000a, 172) emphasised that the effectiveness of the EIA process is dependent on the "degree of success in integrating assessment findings into decision-making in the planning and project cycle" and that this is frequently low in developing countries, starting too late and resulting in poor links with project implementation. Glasson et al. (1999, 352) identified

weaknesses in the closed decision-making approaches and in the integration of EIA with development plans in many developing countries. Too many examples exist in developing countries of mechanistic EIA reports being produced that have little or no effect on decisions (see, for example, Mwalyosi and Hughes, 1997). As Bisset (1992, 217) stated, most EIAs seem to have been a function of justifying a decision (usually to develop) that has already been made and are concerned only with remedial measures.

Lohani et al (1997, 1-12) found one of the major limiting factors concerning the development of Asian EIA practice to be "…the lack of effective communication of EIA results and recommendations to decision makers." In some eastern Asian countries "EIA begins after the construction commences and is used only to confirm that the environmental consequences of the project are acceptable" (Briffett 1999, 161). Boyle (1998, 95) was blunter:

> In Thailand, Indonesia, and Malaysia, political and business support for environmental impact assessment (EIA) is low, and environmental agencies are virtually powerless compared with economic development agencies.

In South America, the influence of EIA on decisions is limited because environmental constraints to investment are considered to threaten current political stability which is seen as depending upon economic growth (Brito and Verocai, 1999, 201). Kakonge (1999) averred that EIA had not resulted in the cancellation of projects in Africa. Mwalyosi and Hughes (1997, 73) reported that EIA had very little impact on decision-making in Tanzania. In particular, there were few examples where dialogue between EIA practitioners and proponents led to project modification before the submission of the EIS.

There appear to be two principal problems: the lack of willingness to integrate EIA either into project planning or into decision making; and the secretive nature of EIA and of decision making. As Lee (2000a, 173) stated:

> To achieve the fullest benefits, changes within both the planning and project cycle and in the decision making context will be needed as well as changes in appraisal methods and procedures.

Two possible solutions to the inadequate integration of EIA into decision making in developing countries present themselves. First, the problem of top-down EIA can be partially overcome by a real (rather than a 'lip-service') commitment by leaders of developing countries to use EIAs in decision making (Ahmad and Sammy, 1985). However, countries are much more likely to use EIAs in decision making if the EIA system responds to their needs, is designed and implemented by their own nationals, and generates simple, easy to use, focussed

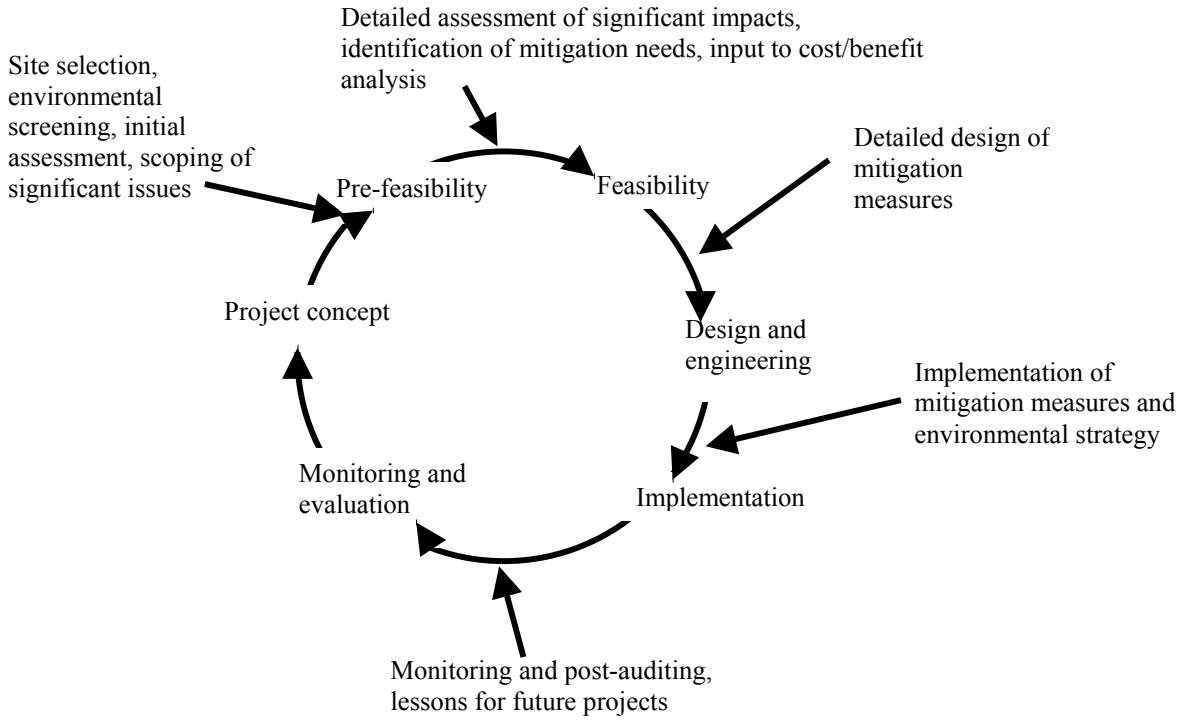
EIA reports (McCormick, 1993). In other words, the EIA process needs to be rooted in the indigenous culture of decision making (even if this is top-down rather than bottom-up)instead of being imposed by external aid agencies (Wilbanks et al., 1993).

UNEP has suggested that EIA must be integrated into the process of designing and implementing projects (i.e. into the 'project cycle') in the country concerned:

> The key seems to lie in the management of the EIA: by designing the process so that it provides useful information to decision-makers at just the right time in the project cycle, EIA can have a real effect on projects (UNEP, 1988, 5).

Figure 1 represents this process diagrammatically. The diversity of decision making contexts found in different developing countries supports UNEP's flexible EIA process, adaptable to local circumstances yet adhering to a number of core principles.

Figure.1 Integration of EIA into the project cycle



Source: United Nations Environment Programme (1988, 5).

Second, piercing the shroud of secrecy could begin if development assistance agencies took the lead in publicising the way in which EIA influenced their own decisions. This would involve considerable, but necessary, change in many cases. An agency could then reasonably demand, perhaps as a condition of aid for a project, that the government department published the EIA report and the reasons for its decision. There are some instances where this has happened (the World Bank made this a condition of funding a project in Egypt, for example (Tawfic, 2001)). As Wilbanks et al. (1993, 740) have stated, "rewards should be offered for doing the environmental impact assessment right". The best reward would be to relate further aid to EIA performance. However, as Abaza (2000, 274) has stated, the attitude of some developed countries and donor agencies can be interpreted as something approaching 'environmental imperialism' within some low and middle-income countries:

> Tying project approval or funding to their compliance to certain environmental conditions [such as the production of an EIA report] is unacceptable to many of these countries, particularly now that they are seeing the superficiality of the commitment by some developed countries to environmental goals.

Relating aid to EIA performance would require considerable political skill as well as close coordination and the sharing of EIA information between the various offices of the relevant development assistance organisation. In some instances, this would cut across development agencies' political agendas and alter the way their staff members operated. However, the World Bank has begun to make reforms in this area that have had a considerable effect. It is encouraging that all the major lending agencies and their staff (and, according to Kennedy (1999, 119), their borrowers) now recognise the need for EIA and have established their own EIA procedures.

Monitoring and auditing of impacts

As in the developed world, monitoring has been a missing step in EIA in developing countries. For example, Lohani et al. (1997) identified the lack of attention and commitment to follow up as a serious shortcoming in Asian EIA practice. EIA monitoring practice in Egypt, Turkey and Tunisia is almost non-existent (Ahmad and Wood, 2002). Projects in developing countries may change substantially between authorisation and implementation and environmental controls may not be observed or monitored. There is relatively little information about the accuracy of developing country EIA predictions.

Biswas (1992) suggested that appropriate compliance monitoring be made a condition of assistance to overcome these difficulties. He also believed that case studies involving post-

auditing the impacts of completed developments were urgently needed. George (2000c) recommended that an environmental management system, for example ISO 14001, be instigated to avoid negative impacts during the operation of projects. He believed that such a structured approach could place clear responsibilities on the stakeholders involved. However, the costs involved in implementing monitoring practices can be high, and although development assistance can initially provide funding, national governments will ultimately need to become more actively involved. In situations where inadequate funds are available for a comprehensive monitoring programme, resources should be targeted towards those impacts identified as being most significant (George, 2000c).

Mitigation of impacts

Mitigation of the impacts of some projects in developing countries is generally considered during the EIA process but is not always implemented. Too often, there is little opportunity for changes to be made to previously designed projects: mitigation is frequently an after-thought. This is certainly the case in, for example, Egypt (Ahmad and Wood, 2002) and in Tanzania (Mwalyosi and Hughes, 1997). Like the treatment of alternatives, mitigation is given less emphasis than in the developed world and, in many instances, mitigation measures remain on the unread pages of the EIA report (ODA, 1992). Remedying this situation must involve the development assistance agencies and government departments negotiating the inclusion of adequate mitigation measures in EIA reports and the subsequent enforcement of their implementation. Kennedy (1999, 120) suggested that the practice of EIA will improve as greater use is made of local environmental experts in implementing mitigation measures.

Consultation and participation

Although it is widely accepted in developed countries that the benefits of stakeholder involvement in EIA include development that delivers more environmental and social benefits and avoids conflict (Donnelly et al., 1998, 21; Wood, 2002, 275), there is no tradition of consultation and participation in many developing countries (Lee, 2000a). Indeed the notion of public participation in decision making is revolutionary in many developing countries (Wilbanks et al., 1993). Thus, Boyle (1998, 95) believed that "the public is effectively excluded from project planning and decision-making" in South East Asia. The same is effectively true in Egypt (Ahmad and Wood, 2002).

Lohani et al. (1997, 2-23) observed that:

> Fifteen years of EIA experience in the Philippines has shown that many problems associated with the EIA process are traceable to a lack of adequate communication and understanding…

They noted that developing countries generally have weak requirements for consultation and public participation, but that as community involvement is becoming more widely recognised as an important element of the success of the EIA process, its use is gradually increasing. However, according to Brito and Verocai (1999), society is still unaware of EIA and of its right to participate in South America. Similarly, Kakonge (1999, 181) reported that the involvement and participation of the African people in the EIA process left much to be desired, thus reducing its effectiveness.

Bisset (2000) observed that the influence of overseas development agencies, most of which have mandatory requirements for public participation, together with changes at the global political level, have been influential in initiating a trend towards more participatory approaches, but that these have perhaps been more discussed than practised. He identified a number of difficulties and constraints concerning effective stakeholder involvement in low-income countries:

- Illiteracy.
- Linguistic and cultural diversity that hinder mutually intelligible communication.
- Lack of local knowledge and understanding regarding the scale, nature and likely effects of certain types of development projects.
- Unequal access to consultative and participatory processes for certain social categories (for example, women).
- Remoteness of some stakeholders.
- Time/cost implications of dealing satisfactorily with these difficulties (Bisset, 2000, 154).

One of the most crucial steps in improving EIA in developing countries is the raising of public awareness and the increasing of opportunities for consultation with affected parties and other interested groups, as well as non-governmental organisations, throughout the EIA process (Glasson et al., 1999; Kennedy, 1999; Abaza, 2000). Appiah-Opoku (2001) stressed the importance of involving indigenous peoples in the EIA process (and incidentally benefiting from their knowledge). Useful first steps to improving consultation and participation might include donor agency encouragement to consult certain designated authorities, the establishment of one or more public interest environmental groups and the active involvement of local universities and research establishments in EIA. Identifying and involving an appropriate range of stakeholders is crucial to the success of the process.

Targeted overseas funding and the production of consultation and participation strategies appropriate to local circumstances may be necessary to facilitate effective stakeholder involvement. Encouragingly, the World Bank's (1999) disclosure requirements now address the issue of making EIA reports for projects it funds accessible.

Monitoring of EIA systems

There is very little EIA system monitoring in developing countries, though there are exceptions. Many environment departments do not keep a record of EIA documents or copies of EIA reports (e.g. South Africa – Wood, 2002). However, some limited informal system monitoring by environmental agencies has taken place in some countries, to try to improve practice by learning from experience. For example, several aspects of the Egyptian EIA system have been monitored, and the screening lists have been modified as a result (Ahmad and Wood, 2002). Not only is there little information about EIA but there is little interest in reviewing the operation of the system. This is beginning to change as EIA organisational capacity and regulatory requirements are expanded. However, motivation and external pressure are also necessary (Ahmad and Sammy, 1985). Making EIA reports widely available would be a useful first step.

Benefits and costs of EIA systems

There is probably a majority view in developing countries that the costs of EIA systems exceed their benefits, though opinions vary from country to country and from stakeholder to stakeholder. In South Africa, for example, almost all stakeholders believe that EIA alters their behaviour and that of others (Wood, 2002). Overall, there was an almost unanimous view that the environmental quality and acceptability of decisions has been improved by EIA. As elsewhere, it is the possibility of delay engendered by EIA rather than the financial cost of EIA that disturbs developers most. The public and the environmental groups tend to see EIA as a means of delaying and improving projects though, while delays were common, stoppage or withdrawal are very rare. Consultants not unnaturally see EIA as a worthwhile process. The South African provincial authorities perceive EIA to be a valuable environmental management tool, though many believe that too many projects are being assessed (Wood, 2002).

It is noticeable that, though EIA has already been accepted in some developing countries, the same arguments about delays, financial resources, lack of expertise, lack of data and confidentiality, which were rehearsed in developed countries when project EIA was being

introduced, have surfaced again in developing countries. It is likely, given the firm encouragement and support of the international community for cost-effective EIA, that the outcome may be similar: that, as practice improves, EIA will come to be widely accepted as an essential part of the development process.

Strategic environmental assessment

Experience of SEA in developing countries is gradually increasing but George (2000a) confirmed that the use of SEA was uncommon in most low- and middle-income countries though there existed several examples of its use. However, he reported that formal provisions were fairly common in central and eastern Europe, though implementation was hampered by lack of screening processes and assessment methodologies. Nevertheless, there is considerable interest in the application of SEA, especially in relation to regional development plans and land use plans for developing areas. Work on the World Bank's national environmental action plans, and on its regional and sectoral environmental assessments means that this type of activity is probably more advanced in some developing countries than in some developed countries. Rees (2000, 249) cited the increasing use of programmatic loans, for example for roads or irrigation schemes, as contributing to the increased use of SEA by the World Bank.

While the various problems relating to the use of strategic environmental assessment (SEA) in developed countries (e.g. skills and data shortages, absence of public participation in policy and plan making) are more acute in developing countries, the potential advantages of using SEA are all the greater precisely because development is taking place so quickly in many areas. Kennedy (1999, 120) was adamant that, for environmental concerns to become truly integrated into investment decision-making, more attention needed to be given to SEA. However, there remains much to be achieved in the implementation of SEA in developing countries (Donnelly et al., 1998; Selvam et al., 1999). Almost all the recommendations for improving EIA advanced in this paper could be applied to the different stages of the SEA process. The need for external support in this endeavour is apparent.

Conclusions

It is not surprising that most developing country EIA systems, which are generally at an early stage in their development, fail to meet the evaluation criteria employed in this review (Table 1), since they were designed to test international good practice. While there are many variations between developing countries (Glasson et al., 1999), these weaknesses are

similar to those reported in the EIA systems in South Africa (Wood, 2002), in various Mediterranean countries (George et al., 2001) and in Egypt, Tunisia and Turkey (Ahmad and Wood, 2002).

Despite the establishment and refinement of EIA systems, and the emergence of SEA, the achievement of sustainable development goals remains elusive. Of course, EIA cannot achieve sustainable development without parallel activities such as enacting legislation, implementing wider environmental controls, awareness raising, improving data systems, counteracting corruption and providing opportunities for public participation. Nevertheless, Rayner (1993, 678), rather depressingly, concluded that, for developing countries:

> EIA remains, at best, a Band-Aid to mitigate the worst consequences of rapid industrial development because it is wealth, not legislation, that leads to indigenous demands for clean energy, stable populations, and stewardship of the land and water.

While the importance of wealth in determining environmental awareness can hardly be exaggerated and the EIA systems in many developing countries have many shortcomings (Table 1), Glasson et al. (1999, 353) have optimistically noted that, "…emerging EIA systems are developing rapidly, learning from existing systems, and adapting EIA techniques to their own needs." Abaza (2000, 275) felt that the development of EIA in developing countries should not be seen in isolation. Improving EIA practice was only one element of the way forward, because actions such as developing legislation, awareness raising, improving data systems and providing opportunities for public participation were also crucial. Spooner (in Donnelly et al., 1998) believed that the priority for improvement in EIA lay not in the production of further EIA guidelines but in training, institutional re-organisation and improved communication. Sankoh (1996) and Briffett (1999, 163) felt that developing country EIA had to be simplified to become more flexible. There are therefore several urgent issues to be addressed, in addition to those suggested in the above evaluation of various stages of the EIA process and the continuing need for research on both substantive (methodological) and procedural (including effectiveness) issues of EIA:

- Training and capacity building in EIA
- Diffusion of EIA experience
- Appropriate donor EIA policy and integration of requirements
- Increased political will.

Numerous commentators have stressed the importance of training to increase the human resource capacity to undertake and review EIAs in developing countries (Ahmad and

Sammy, 1985; Biswas, 1992; Wilbanks et al., 1993; Briffett, 1999; Clark, 1999). As Lohani et al. (1997, 2-20) have noted, "The number of skilled EIA professionals in Asia is severely limited, and human resource development is the top priority." In practice, courses have often failed to be sufficiently practically orientated. There is considerable agreement that training should be provided within individual developing countries. As McCormick (1993, 726) put it:

> Training in the home country makes it nearly impossible for trainers to ignore cultural differences that influence the effectiveness of training ... To provide training for those from developing countries, go there.

Trainers from developed countries themselves require some familiarisation with the cultural norms, as well as the legal procedures, of the countries in which the training takes place. EIA training needs to relate not just to government officials (including senior officials who require an understanding of the EIA process) but also to personnel in environmental consultancies, universities and research institutes. Both longer-term and specialised short courses are necessary. Courses, as in the developed world, need to be multidisciplinary and focused on the practical and operational aspects of EIA rather than on the theoretical aspects of EIA (Biswas, 1992).

In order to diffuse good developing country EIA practice, there is a need for a database of EIA regulations (above), organisations, guidance and experience in developing countries to enable countries to adapt proven examples in designing their EIA systems. Such a database (which could build on the work of Donnelly et al., 1998) would aid communication, which is often very poor, between environmental agencies in developing countries. The lessons learned in one developing country (and by one development assistance agency) could then more easily be passed on to others (Kakonge, 1999).

Ortolano (1993, 361) has stressed how important the role of development assistance agencies is in improving EIA in developing countries:

> Development aid agency control has great potential for bringing about effective EIA in developing countries, particularly those without national EIA requirements. ... However, this potential has not yet been fully realised because aid agencies have been slow to impose EIA requirements on recipients and even slower to enforce consistently nontrivial compliance with their own requirements. Under these circumstances, project proponents receiving development aid have often been able to get by with token compliance with the EIA requirements of donors.

Further, the various approaches and regulations used by the numerous development assistance agencies can lead to confusion and contradiction with national EIA requirements. While the

situation is improving, as the development assistance agencies have increasingly become aware of the major role they should be playing (Kennedy, 1999), the need for greater co-ordination between different donor requirements remains acute. Thus, Scholten and Post (1999) noted that the variety of appraisals sometimes required by overseas development agencies, including EIAs, social impact assessments and cost benefit analyses, can result in a cumbersome and ineffective project development process. They suggested that:

> the need for the integration of impact assessments has arisen in order to overcome the difficulties in synthesizing the results of a number of aspect by aspect impact assessments (Scholten and Post, 1999, 236).

In addition, the effectiveness of EIA (and SEA) has not, to date, been assisted by the emergence of integrated impact assessment (IIA). The integration of economic, social and environmental factors in IIA has sometimes been to the disadvantage of the environment. The subordination of EIA and SEA to IIA may ignore the lessons of history. After all, EIA was originally developed to ensure that environmental costs - previously neglected - were adequately considered in decisions. It is **environmentally** sustainable development that EIA and SEA strive to achieve. The effectiveness of EIA and SEA (and of IIA) would be bolstered if their bottom line goal were to be 'no net environmental deterioration'.

Lack of political will and vision is undoubtedly the biggest constraint to making EIA effective in developing countries (Briffett, 1999, 163). There is insufficient political priority accorded to the environment in general, and EIA in particular, in many developing countries. While many officials in environmental ministries, and others, may appreciate the relationship between rational management of the environment and long-term economic development (and thus be enthusiastic about EIA), most politicians either do not or choose to ignore it in favour of more immediate goals. This lack of political will is allied both to existing systems, in which pressing environmental concerns (frequently fuelled by severe environmental degradation) often cannot be effectively represented politically, and to widespread corruption. Abaza (2000) believed that the political resistance and scepticism towards EIA in developing countries owed much to the perception of EIA as being intrinsically anti-development, an unpopular notion in countries currently locked into patterns of rapid economic development.

As in the developed world, only widespread popular demand for environmental improvement will ensure that effective EIA systems are introduced in developing countries. Since the pace of change is so much greater in developing countries, it would be appropriate

for a greater proportion of the world's EIA expertise (appropriately adapted) and resources to be devoted to them if real progress towards sustainable development is to be made.

References

ABAZA, H. (2000), 'Strengthening future environmental assessment practice: an international perspective', in N. Lee and C. George (eds*) Environmental Assessment in Developing and Transitional Countries,* Chichester, John Wiley and Sons.

ADGER, W. N. and CHIGUME, S. (1992), 'Methodologies and institutions in Zimbabwe's evolving environmental assessment framework', *Third World Planning Review,* **14**, 283-295.

AHMAD, B. and WOOD, C. M. (2002), 'Environmental impact assessment in Egypt, Turkey and Tunisia', *Environmental Impact Assessment Review*, **22**, 213-234.

AHMAD. Y. J. and SAMMY, G. K. (1985), *Guidelines to Environmental Impact Assessment in Developing Countries,* London, Hodder and Stoughton.

ANNANDALE, D. (2001), 'Developing and evaluating environmental impact assessment systems for small developing countries', *Impact Assessment and Project Appraisal*, **19,** 187-193.

APPIAH-OPOKU, S. (2001), 'Environmental impact assessment in developing countries: the case of Ghana', *Environmental Impact Assessment Review,* **21**, 59-71.

BANHAM, W. and BREW, D. (1996), 'A review of the development of environmental impact assessment in India', *Project Appraisal*, **11**, 195-202.

BISSET, R. (1992), 'Devising an effective environmental assessment system for a developing country: the case of the Turks and Caicos Islands', in A. K. Biswas and S. B. C. Agarwala (eds.) *Environmental Impact Assessment for Developing Countries*, Oxford, Butterworth-Heinemann.

BISSET, R. (2000), 'Methods of consultation and public participation', in N. Lee and C. George (eds.) *Environmental Assessment in Developing and Transitional Countries*, Chichester, John Wiley and Sons.

BISWAS, A. K. (1992), 'Summary and recommendations', in A. K. Biswas and S. B. C. AGARWALA (eds.) *Environmental Impact Assessment for Developing Countries,* Oxford, Butterworth-Heinemann.

BISWAS, A. K. and AGARWALA, S. B. C. (eds.) (1992), *Environmental Impact Assessment for Developing Countries*, Oxford, Butterworth-Heinemann.

BOYLE, J. (1998), 'Cultural influences on implementing environmental impact assessment: insights from Thailand, Indonesia, and Malaysia', *Environmental Impact Assessment Review*, **18**, 95-132.

BRIFFETT, C. (1999), 'Environmental impact assessment in east Asia', in J. Petts (ed.) *Handbook of Environmental Impact Assessment, Volume 2*, Oxford, Blackwell.

BRITO, E. and VEROCAI, I. (1999), 'Environmental impact assessment in south and central America', in J. Petts (ed.) *Handbook of Environmental Impact Assessment, Volume 2*, Oxford, Blackwell.

CLARK, B. D. (1999), 'Capacity building', in J. Petts (ed.) *Handbook of Environmental Impact Assessment, Volume 2*, Oxford, Blackwell.

COMMISSION OF THE EUROPEAN COMMUNITIES (1993a), *Environmental Manual: Environmental Procedures and Methodology Governing Lome IV Development Cooperation Projects,* Brussels, DGVII, CEC.

DE LA MAZA, C. L. (2001), 'NEPA's influence in developing countries: the Chilean case', *Environmental Impact Assessment Review* **21**, 169-179.

DONNELLY, A., DALAL-CLAYTON, B. and HUGHES, R. (1998), *A Directory of Impact Assessment Guidelines*, London, International Institute for Environment and Development, 2nd edition.

EBISEMIJU, F. S. (1993), 'Environmental impact assessment: making it work in developing countries', *Journal of Environmental Management*, **38**, 247-273.

El-FADEL, M., ZEINATI, M. and JAMALI, D. (2000), 'Framework for environmental impact assessment in Lebanon', *Environmental Impact Assessment Review*, **20**, 579-604.

GEORGE, C. (2000a), 'Comparative review of environmental assessment procedures and practice', in N. Lee and C. George (eds*.) Environmental Assessment in Developing and Transitional Countries*, Chichester, John Wiley and Sons.

GEORGE, C. (2000b), 'Environmental impact prediction and evaluation', in N. Lee and C. George (eds.) *Environmental Assessment in Developing and Transitional Countries*, Chichester, John Wiley and Sons.

GEORGE, C. (2000c), 'Environmental monitoring, management and auditing', in N. Lee and C. George (eds.) *Environmental Assessment in Developing and Transitional Countries*, Chichester, John Wiley and Sons.

GEORGE, C., NAFTI, R. and CURRAN, J. (2001), 'Capacity building for trade impact assessment: lessons from the development of environmental impact assessment', *Impact Assessment and Project Appraisal*, **19**, 311-319.

GIBSON, R. B. (1993), 'Environmental assessment design: lessons from the Canadian experience', *The Environmental Professional* 15: 12-24.

GLASSON, J. and SALVADOR, N. N. B. (2000), 'EIA in Brazil: a procedures – practice gap. A comparative study with reference to the European Union, and especially the UK', *Environmental Impact Assessment Review*, **20**, 191-225.

GLASSON, J., THERIVEL, R. and CHADWICK, A. (1999), *Introduction to Environmental Impact Assessment*, London, UCL Press, 2nd edition.

HILDEBRAND, S. G. and CANNON, J. B. (eds.) (1993), *Environmental Analysis: the NEPA Experience,* Lewis, Boca Raton, FL.

HOLLICK, M. (1986), 'Environmental impact assessment: an international evaluation', *Environmental Management* **10**: 157-178.

JONES, C. E. (1999) 'Screening, scoping and consideration of alternatives', in J. Petts (ed.) *Handbook of Environmental Impact Assessment, Volume 1*, Oxford, Blackwell.

KAKONGE, J. O. (1999), 'Environmental impact assessment in Africa', in J. Petts (ed.) *Handbook of Environmental Impact Assessment, Volume 2,* Oxford, Blackwell.

KENNEDY, W. V. (1988), 'Environmental impact assessment in North America, Western Europe: what has worked where, how and why?' *International Environment Reporter* **11**: 257-262.

KENNEDY, W. V. (1999), 'Environmental impact assessment and multilateral financial institutions', in J. Petts (ed.) *Handbook of Environmental Impact Assessment, Volume 2*, Oxford, Blackwell.

LEE, N. (2000a), 'Integrating appraisals and decision making', in N. Lee and C. George (eds.) *Environmental Assessment in Developing and Transitional Countries*, Chichester, John Wiley and Sons.

LEE, N. (2000b), 'Reviewing the quality of environmental assessments', in N. Lee and C. George (eds.) *Environmental Assessment in Developing and Transitional Countries*, Chichester, John Wiley and Sons.

LEE, N. and GEORGE, C. (eds.) *Environmental Assessment in Developing and Transitional Countries,* Chichester, John Wiley and Sons.

LOHANI, B. N., EVANS, J. W., EVERITT, R. R., LUDWIG, H., CARPENTER, R. A. and TU, S-L. (1997), *Environmental Impact Assessment for Developing Countries in Asia,* Manila, Asian Development Bank.

McCORMICK, J. F. (1993), 'Implementation of NEPA and environmental impact assessment in developing countries', in S. G. Hildebrand and J. B. Cannon (eds.) *Environmental Analysis: The NEPA Experience*, Lewis, Boca Raton, FL.

MEMON, P. A. (2000), 'Devolution of environmental regulation: environmental impact assessment in Malaysia', *Impact Assessment and Project Appraisal*, **18**, 283-293.

MODAK, P. and BISWAS, A. K. (1999), *Conducting Environmental Impact Assessment for Developing Countries,* Tokyo, United Nations University Press.

MOKHEHLE, L. and DIAB, R. (2001), 'Evolution of environmental impact assessment in a small developing country: a review of Lesotho case studies from 1980 to 1999', *Impact Assessment and Project Appraisal*, **19**, 9-11.

MWALYOSI, R. and HUGHES, R. (1997), *The Performance of EIA in Tanzania: an Assessment,* London, Environmental Planning Issues 14, International Institute for Environment and Development.

ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT (1992), *Good Practices for Environmental Impact Assessment of Development Projects,* Paris, Development Assistance Committee, OECD.

ORTOLANO, L. (1993), 'Controls on project proponents and environmental impact assessment effectiveness', *The Environmental Professional*, **15**, 352-63.

OVERSEAS DEVELOPMENT ADMINISTRATION (1992), *Manual of Environmental Appraisal*, London, ODA, 2nd edition.

RAMANATHAN, R. and GEETHA, S. (1998), 'Socio-economic assessment of industrial projects in India', *Impact Assessment and Project Appraisal*, **16**, 27-32.

RAYNER, S. (1993), 'Introduction: the international influence of NEPA', in S. G. Hildebrand and J. B. Cannon (eds.) *Environmental Analysis: the NEPA Experience*, Lewis, Boca Raton, FL.

REES, C. (2000), 'EA procedures and practice in the World Bank', in N. Lee and C. George (eds.) *Environmental Assessment in Developing and Transitional Countries,* Chichester, John Wiley and Sons.

SADLER, B. (1996), *International Study of the Effectiveness of Environmental Assessment*, Hull, Quebec, Canadian Environmental Assessment Agency.

Sadler B (1998) Ex-post evaluation of the effectiveness of environmental assessment. In Porter A L and Fittipaldi J J (eds.) (1998) *Environmental Methods Review: Retooling Impact Assessment for the New Century*. Atlanta, GA, Army Environmental Policy Institute.

SANKOH, O. A. (1996), 'Making environmental impact assessment convincible to developing countries', *Journal of Environmental Management*, **47**, 185-189.

SCHOLTEN, J. J. and POST, R. A. M. (1999), 'Strengthening the integrated approach to impact assessments in development cooperation', *Environmental Impact Assessment Review*, **19**, 233-243.

SELVAM, L. P., KAPOOR, S., MODAK, P. and GOPALAN, R. (1999), *India: Review of the Effectiveness of Environmental Assessments in World Bank-Assisted Projects,* Washington, DC, World Bank.

TAWFIC, M., Director, Suez Canal University Environmental Impact Assessment Unit (2001) 'Personal communication'.

UNITED NATIONS ENVIRONMENT PROGRAMME (1988), *Environmental Impact Assessment: Basic Procedures for Developing Countries,* Bangkok, UNEP Regional Office for Asia and the Pacific.

WILBANKS, T. J., HUNSAKER, D. B. Jr., PETRICH, C. H. and WRIGHT, S. B. (1993), 'Potential to transfer the US NEPA experience in developing countries', in S. G. Hildebrand and J B Cannon (eds.) *Environmental Analysis: the NEPA Experience*, Lewis, Boca Raton, FL.

WOOD, C. (2000), 'Screening and scoping', in N. Lee and C. George (eds.) *Environmental Assessment in Developing and Transitional Countries*, Chichester, John Wiley and Sons.

WOOD, C. (2002), *Environmental Impact Assessment: a Comparative Review*, Harlow, Prentice Hall, 2nd edition.

WORLD BANK (1991), *Environmental Assessment Sourcebook*, Washington, DC, World Bank (3 volumes).

WORLD BANK (1995), 'Implementing geographic information systems in environmental assessment', in *Environmental Assessment Sourcebook: Update No 9*, Washington, DC, World Bank.

WORLD BANK (1997a), *The Impact of Environmental Assessment: the World Bank's Experience,* Washington, DC, World Bank.

WORLD BANK (1997b), *World Development Report 1997: the State in a Changing World,* Oxford, Oxford University Press.

WORLD BANK (1999), *Environmental Assessment*. Operational Policy, Bank Procedure and Good Practice 4.01, Washington, DC, World Bank.