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SUSTAINABILITY IN FOCUS: THE ROLE OF ENVIRONMENTAL IMPACT ASSESSMENT

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ABSTRACT

The development of Environmental Impact Assessment (EIA) has faced significant impediments, hindering its potential to effectively mitigate environmental degradation. However, EIA has emerged as a new commitment to environmental protection, playing a crucial role in integrating sustainability into development projects. Strategic Environmental Assessment (SEA) is essential for evaluating policies, plans, and programs, ensuring the implementation of the sustainable development principle. A tiered approach to EIA, encompassing both project-level and strategic assessments, enhances the effectiveness of environmental impact management. Guidelines for EIA preparation must be established and adhered to, ensuring that assessments are comprehensive, transparent, and participatory. By adopting a tiered approach and prioritizing SEA, EIA can become a powerful tool for achieving sustainable development and environmental protection. This paper explores the role of EIA in promoting sustainability, highlighting the importance of SEA, and discussing guidelines for effective EIA preparation.

Keywords: *Environmental Impact Assessment (EIA), Strategic Environmental Assessment (SEA), Sustainable Development, Environmental Protection, Impact Assessment*

1. INTRODUCTION

Reason dictates that man ought to look before he leaps. In environmental terms, this translates to knowing the environmental consequences of his actions before acting upon them. In environmental parlance, this is called Environmental Impact Assessment (EIA).

EIA is the process of predicting and evaluating an action's impacts on the environment, the conclusions to be used as a tool in decision making. EIA is an effort to anticipate, measure and weigh the socio-economic and bio-physical changes that may result from a proposed project. It assists and enables the decision makers in considering the proposed project's environmental costs

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and benefits, thus making the project justiciable if its proposed benefits sufficiently exceed its cost. But what must be properly understood here is that it cannot, by itself, achieve that prevention. In short, we can state, that EIA involves the process of reviewing the existing state of the environment and the characteristics of the proposed action (and possibly alternative actions); predicting the state of the future environment with and without the action (the difference between the two being the action's impacts); considering methods for reducing or eliminating any negative impact: preparing an environmental impact statement (EIS) that discusses these points; and after a decision is made about whether the action should proceed, possibly monitoring the actual impacts of the action. The EIA, as an approach to environmental issues, can be characterised as multidisciplinary and predictive.

The one area, which is a refined version of EIA, and which is growing and attracting considerable interest is the Strategic Environmental Assessment (SEA), which is the consideration of the environmental impacts of PPPs-policies, plans and programmes. The Netherland government set up a statutory SEA system in 1987. the New Zealand authorities have required its preparation since late 1991, and the European Community's (EC) Directorate General XI produced a proposed directive

The development of EIA started more than twenty years ago in the U.S. with the U.S. National Environmental Policy Act (NEPA) of 1969 (U.S. Govt. 1970) and rapidly spread to countries like Canada (1973), Australia (1974), West Germany (1975), France (1976) and later world-wide. In 1985, EC Directive 85/337 made EIA mandatory in certain circumstances, and more uniform throughout the European community than previously. In India, a new mechanism to protect environmental concerns has been initiated that requires the Planning Commission's approval of any major project, and a review report by the Department of Environment, which was established in November 1980. The EIA was introduced in 1984 to achieve a more comprehensive oversight of major projects.

Although no equivalent statutory mandate exists in India, an administrative requirement for minimal environmental impact reports based on departmental guidelines is applied to certain development projects. Under these guidelines, project authorities are required to submit environmental information to the Central Ministry of Environment and Forests, by filing out "questionnaires" or checklists along with their detailed project reports. Sometimes the ministry also insists that an EIS accompany an Environmental Management Plan. The task of environmental appraisal is carried out by a multi-disciplinary staff in the ministry's "impact

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statement divisions". After preliminary scrutiny of environmental impacts in one of these divisions, the project proposal is considered by the ministry's "environmental appraisal committee". These committees hold discussions with the project authorities and wherever necessary, visit the sites for on-the-spot assessment. On the basis of these deliberations and evaluations, the committees approve or reject the projects.

When projects are approved, the approval is usually conditional upon the implementation of specified safeguards.[1]

The African continent lags behind others in its implementation of ElAs, mainly due to its growing population, frequent and violent changes in government, environmental calamities, and its endemic corruption, which leaves few resources for preventive environmental management, in a continent that needs it probably more than any other.[2] Most of the EIAs in Africa and South America are carried out by development organisations such as the World Bank and USAID.[3]

2. IMPEDIMENTS TO THE DEVELOPMENT OF EIA

EIA, however, is neither a bed of roses nor is it unimpeachable. There are several hurdles to its development.

Firstly, the type of projects that tend to be subject to an imposed requirement for EIA are often limited. Those that are frequently excluded include defence and security related projects, agricultural and afforestation projects, small-scale projects, and projects under the remit of uncooperative government agencies or of particularly powerful lobby groups. Barrett and Therivel, in their book on Japan, have stated that the Japanese government requires a weaker form of EIA for power stations than for other forms of development, because the powerful Ministry of International Trade and Industry argues that energy production is a matter of national importance and thus should not be impeded.[4]

Secondly, the information required in an EIA is also often limited, as the regulations or guidelines may not require the full range of potential impacts to be addressed.

[1] *See,* A. Rosencranz *et al.. Environmental Law and Policy in India: Cases. Materials* & *Statutes* (1992).
[2] *See,* P. Harrison, *The Greening of Africa (1987).*
[3] P. Wathern, *Environmental Impact Assessment (1988).*
[4] B. Barett and R. Therivel, *Environmental Policy and Impact Assessment in Japan (1991).*

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Thirdly, the objectivity and thoroughness of an EIA is also influenced by the organisation that carries it out. Usually, the proponent, not an independent, local or a neutral government agency, carries it out. In the U.K. for instance, the EIAs have been shows to cost between .000025 and 5% of project cost.[5]

The participation by the public at the preparation of EIA also influences its effectiveness. Collections of environmental impact statements have been set up in many countries, both to improve public participation and as a way of improving the quality of future EIAS.[6]

The above, then, are not the only impediments. A project, for example, even though it passes the EIA test, may face other (sometimes totally unrelated) political, social and economic factors, which hamper its development. And finally, the techniques and procedures for monitoring and auditing of actual environmental impacts are still in their infancy.[7]

The predictions that are made in EIAs are rarely tested against what actually happens when the project is built and operated, so impact predictions have little chance of being improved.[8]

3. EIA - A NEW COMMITMENT TO ENVIRONMENTAL PROTECTION

EIA as an "enduring legacy" not only symbolised a new commitment to environmental protections but was an "affirmation of faith" in the use of science for planning and decision making.

The EIA is only one form of impact assessment, there are many others. However, the early versions of impact assessment were always prefaced by the adjective 'environmental'; as in environmental assessment or environmental impact assessment. As the field developed, additional prefixes surfaced such as technology assessment, social impact assessment, community assessment and so on.

However, according to Rossini and Porter, all forms of impact assessment ideally have several

[5] T.P. Coles *et ai., Environmental Assessment: Experiences in UK.* (Paper presented at first membership conference. Institute of Environmental Assessment. Birmingham) (1992).
[6] R. Therivel. *Directory of Environmental Statements* 1988-1991 (1991).
[7] R. Therivel *et al., Strategic Environmental Assessment (1992).*
[8] R. Bisset and P. Tomlinson. *Monitoring and Auditing of Impacts* in P. Wathem (Ed.) *Environmental Impact Assessment (1988).*

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key factors or features in common.[9] They should be effects- focussed, future-oriented; centred around technological developments, systematic, comprehensive and inter-disciplinary in approach, comparative and policy-oriented.

The EIA fits all the above, and emphasises the bio-physical sciences, providing a process whereby the principles and paradigms of ecological science can be applied to the consideration of the ecological effects of various forms of development on natural ecosystems.[10] EIA bases its foundation on Risk Assessment (RA). An environmental risk is a hazard or danger with adverse, probabilistic consequences. It is involved with how different societies evaluate risk.[11] According to L. Graham Smith, RA basically involves three elements:[12] risk identification, risk estimation and risk evaluation.

Impact assessment and risk assessment are mutually supportive concepts.[13] In most impact assessments, technical and economic factors are handled with clarity. Other factors, such as duration of impacts, uncertainty and public preferences, are usually less precise and controllable, remaining fuzzy and, ultimately, inconsequen- tial to the final assessment of impact. The present status has been succinctly stated by Clark & Herlington's[14] as: *"an excessive interest in methodologies and techniques has.... tended to direkt attention away from viewing the experience of EIA within the broad process of environmental planning"*. In other words good, in technique, but poor in process; for e.g., successive administrations in the United States have chosen to leave the interpretation and enforcement of the National Environmental Policy Act (NEPA) largely to the courts. This has resulted in an emphasis on the judicially enforceable aspects of NEPA to the neglect of its substantive provisions.[15] Its problems are *"less scientific and technical than political"*[16]

It is only through reconceptualization and consideration of process as well as methodology, that impact assessment will achieve its full promise.

[9] F.A. Rossini and AL Porter, *Why Impact Assessment?* in F.A. Rossini and A.L. Porter (Eds.) *Integrated Impact Assessment (1983).*
[10] S.M. Hirst, *Applied Ecology and the Real World* 18, 189-213 (1984).
[11] A.Y. Whyte and 1. Burton (Eds.) *Environmental Risk Assessment* (1980). John Wiley, *Analysing Technological Risks in Federal Regulatory Agencies* in M.E. Kraft & N.S. Yig. (Eds.) *Technology & Politics* 184-207 (1988).
[12] L. Graham Smith, *Impact Assessment and Sustainable Resource Management, Themes in Resource Management (1993).*
[13] A.P. Grima *et al.* (Eds.) *Risk Perspectives on Environmental Impact Assessment (1989).*
[14] Clark *et al.* (Eds.) *The Role of Environmental Impact Assessment in the Planning Process (1988).*
[15] L.K. Caldwell, *Environmental Impact Analysis (ElA). Origins, Evolution and Future Directions, Impact Assessment Bulletin* 6, 75-83 (1988).
[16] *Id.*

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4. IMPORTANCE OF STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)

SEA can be defined as the formalised, systematic and comprehensive process of evaluating the environmental impacts of a policy, plan, or programme and its alternatives, including the preparation of a written report on the findings of that evaluation, and using the findings in publicly accountable decision-making.[17]

SEA is an improvement over project EIA. There are some important differences between the EIA and SEA -

1) EIA cannot by itself lead to a comprehensive protection of the environment for the simple reason that the EIA reacts to development proposals rather than anticipating them;
2) EIA does not consider the cumulative impacts of more than a single project. It does not, for example, consider whether the environment may be resilient up to a certain level and whether it may degrade subsequently; whether the total impacts of several projects exceed the sum of their individual impacts (synergistic impacts); the cases where additive impacts of developments that do not require EIA according to existing legislation; where one development project can stimulate secondary developments and infrastructure; where the environment does not have time or space to recover from one impact before it is subject to the next one, otherwise called time-crowded or space-crowded impacts.

The consideration of cumulative impacts in project EIA is often limited by the lack of knowledge concerning other development proposals and lack of control over these proposals.[18]

Further, project EIA discusses alternatives to the proposed project in a limited manner. This is primarily due to the fact that a project's details are already drawn up with irreversible decisions by the time an EIA is prepared, and also partly due to the reason of lack of guidance and emphasis meted out to alternatives in EIA legislations. The United States provides a good lead wherein USCEQ[19] states that EIAs must rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated. This, however, does not allow for an assessment of

[17] R. Therivel *et al., Strategic Environmental Assessment (1992).*
[18] T. Montgomery, *An Introduction to the Concept of Tiered Environmental Assessment (1990).*
[19] U.S. Council on Environmental Quality *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* 40 (1978).

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alternatives in earlier stages of planning, as would be provided for by SEA. Another factor that is similarly limited is the measures for mitigation of impacts proposed in project EIA.

3) Another fundamental difference between an EIA and a SEA is the public participation. Public consultation is often brought into a project too late to make an adequate contribution. A strategic approach would enable relevant experts to be more fully involved at early stages of planning. A similar view has been expressed by Contant and Wiggins, and by Montgomery.[20]

5. SEA THE IMPLEMENTOR OF THE 'SUSTAINABLE PRINCIPLE'

SEA has been defined by Jacobs, as meaning that, the environment should be protected in such a condition and to such a degree that environmental capacities (the ability of the environment to perform its various functions) are maintained over time: at least at levels sufficient to avoid future catastrophe, and at most at levels which give future generations the opportunity to enjoy an equal measure of environmental consumption.[21] SEA is needed as a way of implementing the above concept.

The Netherlands, which is the front runner of the above National Environmen- tal Policy Plan (NEPP) of 1990, aims to carry out the requirement of an EIA for all policies, plans and programmes that have significant environmental impacts. Thus, we see that SEA would not only overcome the worst limitation of the existing system of project EIA, but it would be a proactive step towards attaining sustainability.

SEA is nothing but an extension of the EIA. If EIA can be considered as a 'solid rock', SEA can be viewed as a beautiful structure that has taken final shape. SEA helps in chopping of irregularities of and smoothening out the rough edges in the functioning of EIA, It requires institutions to consider the consequences of a range of actions early on in the planning process; to choose the most beneficial action on the environmental as well as on the socio-economic grounds, and to minimise any harmful environmental impacts. It is characterised by its strategic nature and its emphasis on preventing environmental damage. Its role is thus akin to the "precautionary principle".

[20] C. Contant and L. Wiggens, *Defining and Analysing Cumulative Environmental Impacts: Environmental Impact Assessment Review* 11(4), 297-309 (1991): Montgomery, *supra* n. 18.
[21] M. Jacobs, *The Green Economy (1991).*

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The methodologies for SEA are not yet fully developed. They are, however, likely to include elements of cost-benefit and monetary valuation, cope with the high levels of uncertainty, encourage the development of precautionary methodologies as well as the collection and interpretation of baseline environmental data. It thus allows the principle of sustainability to be implemented in a phased way from policies to plans, programmes and the projects.

6. THE TIERED APPROACH TO EIA

Several academicians and governmental agencies have suggested that EIA be carried out in "overlapping tiers".[22]

7. GUIDELINES FOR THE PREPARATION OF EIA

A number of guidelines for the preparation of EIAs have been published by international organisations.[23] The following outline summaries the basic elements included in most of them:

1) Environmental impacts should be identified before the completion of the preliminary design of the project. This process identifies problem likely to be significant and to require special study. If no significant impacts are found, a decision may be made that no EIA is necessary, or that a full EIA need not be performed.
2) A baseline study should be prepared, projecting environmental changes likely to occur in the absence of the project and those likely to occur with the project.
3) An evaluation of the environmental impacts on humans, natural resources, production, ecology, social organisations, and cultures should be prepared and to the maximum extent possible converted into monetary costs.
4) Mitigation measures should be determined for the environmental impacts indicated in (3), together with cost estimates of mitigation measures.
5) Comparison of the costs of alternative measures for mitigating environmental impacts with the benefits of those measures should be made, using benefit-cost analysis, in preparation of the final project design. The alternatives should include entirely different projects with less harmful environmental impacts or no project.
6) An EIA should be made available to officials responsible for the final approval of the project or for a loan for the project. A detailed summary (if not the entire EIA) should be made available to the public well before approval of the project of loan.

[22] For example, see, *The California Environmental Quality Act,* State of California (1986).
[23] See, for example, UNESCAP *Environmental Impact Assessment: Guidelinl!s for Planners and Decision Makers,* UN Economic and Social Commission for Asia and the Pacific (1985).

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8. CONCLUSION

According to Raymond F. Mikesell, many projects have few adverse environmental impacts and hence, do not require EIAs. However, this must be determined by careful identification, for example, education of medical projects may be regarded as harmless to the environment until it is discovered that the buildings required are to be erected on wetlands, or that the chemical wastes from the laboratories are to be dumped in a river. It is important, however, that the mitigation measures be allowed for in the project design. [24]

Mining projects, for example, do definitely require an EIA. But the completion of an EIA, may run into several millions of dollars sometimes requiring as high as 20% of the capital costs of the mine, thereby making it highly unprofitable or uninviting to the government of private foreign investors. A case study example can be found in the OK Jedi Copper and Gold mining project in Papua New Guinea, where the Government of Papua New Guinea decided to allow the private mining company to go ahead with the project, despite the fact that no proper EIA was conducted for environmental safeguards. This was due to the fact that the company was unwilling to spend exorbitant amounts on environmental planning of the projects without the assurance of a mining agreement. Also note that no comprehensive EIA for the Sardar Sarovar project was conducted before the world bank loan was made in 1985.

Thus, the EIA may identify all the environmental impacts of a project, provide reliable estimates of their full social costs, and yet not embody the principle of sustainability.

EIA is an ever-increasing, ever-expanding and popular concept. Its importance in present day life is not to be underestimated. In UNCED parlance, the importance of information is captured in the principle of transparency. The EIA of projects is widely carried out, but its effectiveness is constrained by socio-political and economic factors. It is also limited by the fact that it generally applies only to the lowest project tier of assessment, which in turn is heavily influenced by the higher strategic tiers that give rise to the projects.

[24] Raymond F. Mikesell, *Economic Development and the Environment - A Comparison of Sustainable Development with Conventional Development Economics* 96-97 (1992).