To Study the Inception and Evolution of Environmental Impact Assessment in the World and in India and to Analyze and Comment upon the Environmental Clearance Process in the Country

Dissertation Submitted in Partial Fulfillment
of the requirements for the Degree of

MASTERS OF SCIENCE

IN

ENVIRONMENTAL STUDIES

Govind Singh

School of Environmental Studies
University of Delhi
Delhi

MAY 2007

CERTIFICATE

The present work embodied in this dissertation entitled “To study the inception and evolution of Environmental Impact Assessment in the World and in India and to analyze and comment upon the Environmental Clearance process in the country” is original and has not been submitted in part or full for any degree or diploma of this or any other University. This dissertation is being submitted towards partial fulfillment of the M.Sc. Degree in Environmental Studies, Delhi University.

Supervisor
Dr. Arun Bhaskar
Center for Interdisciplinary Studies of
Mountain & Hill Environment
University of Delhi

Govind Singh
(Student)

Prof. Mihir Deb
Director
School of Environmental Studies
University of Delhi

ACKNOWLEDGEMENT

There is always a sense of gratitude, which must be expressed to others for the helpful and needy services they render during all phases of life. I too would like to do it as I really wish to express my thanks to all those who have helped me in getting this mighty task of Dissertation to a successful end. I am highly indebted to my Supervisor **Dr. Arun Bhaskar** who played the most important role in providing valuable suggestions, support, encouragement and understanding required during the preparation of this dissertation. I also thank him for providing me with the infrastructure, facilities (in station and out station), and a conducive environment for my work.

I would also like to thank Dr. D.C. Nautiyal and Mr. Sanjay for their time and guidance throughout the field trip.

I extend my sincere gratitude to Kanchi Kohli of Kalpavriksh Environment Action Group and to Sunita Dubey for their meaningful and timely replies to my long mails.

I also take this opportunity to thank Prof. Mihir Deb for his much-needed support and concern in rejuvenating my spirits from time to time.

Last, but not the least, I would like to thank the entire staff of CISMHE for their unlimited support and cheerful cooperation throughout the tenure of my dissertation.

So once again I wish my humble thanks towards all of them.

CONTENTS

OBJECTIVE

The objective of this study is to understand the Environmental Clearance (EC) process in the world and in India, for initiating development projects or for expanding the existing ones. Since EC is almost synonymous to Environmental Impact Assessment (EIA), this study is focused on the inception and evolution of EIA world over. It tries to understand the need for an EIA and its relevance in today's world. The study further tries to highlight the EC process in India and compare the EIA Notification of 2006 with the previous (1994) Notification, and identify any vulnerability in the existing (2006) Notification.

The study also tries to emphasize upon the need to standardize EIAs for respective countries, in order to make it more effective and useful. Some components that can be and have been used to improve EIA in India are discussed vividly in this dissertation. The need for a comprehensive Strategic Environmental Assessment (SEA) even before projects are conceived and the importance of such a strategy, particularly for the developing countries is also discussed.

The dissertation is written and compiled in such a way that it can serve as a basic introduction to anyone who wants to understand, carry out or enquire into one of the most important environmental tools of all times - Environmental Impact Assessment.

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List of Abbreviations

ADB	Asian Development Bank
CEQ	Center for Environmental Quality
CISMHE	Center for Interdisciplinary Studies on Mountain & Hill Environment
DC	District Collector
DAC	Development Assistance Committee
DST	Department of Science & Technology
DoE	Department of Environment
EA	Environmental Assessment
EAC	Environmental Appraisal Committee
EC	Environmental Clearance
EES	Environmental Effects Statement
EPH	Environmental Public Hearing
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMP	Environment Management Programme
EPA	Environment (Protection) Act
ES	Environment Statement
EU	European Union
GC	General Conditions
GIS	Geographical Information System
IAIA	International Association of Impact Assessment
MoEF	Ministry of Environment & Forests
NCEPC	National Committee on Environmental Planning and Coordination
NGO	Non-Governmental Organization
NEPA	National Environmental Policy Act, 1969
OECD	Organization for Economic Cooperation and Development
OD	Operation Directive
SEA	Strategic Environmental Assessment
SEAC	State level Environmental Appraisal Committee
SDM	Sub-District Magistrate
SIA	Social Impact Assessment
SEIAA	State / Union Territory Environment Impact Assessment Authority
SPCB	State Pollution Control Board
ToR	Terms of Reference
TEKMS	Traditional Environmental Knowledge Management System
UNEP	United Nations Environment Programme
UN	United Nations
WB	World Bank

1. Environmental Impact Assessment

“Earth provides enough to satisfy every man's need, but not every man's greed”

- Mahatma Gandhi (1869 - 1948)

1.1 Introduction

Environmental degradation and the depletion of natural resources induced by human activities have attracted steadily growing concerns in the last decades. Such concerns made evident the necessity for the planning authorities to count on sound information about the possible environmental consequences of development actions. One of the tools available to satisfy this need is represented by the procedure of Environmental Impact Assessment (EIA). This procedure involves the systematic identification and evaluation of the impacts on the environment caused by a proposed project. EIA is now applied worldwide. Its potential role in attaining sustainable development objectives was explicitly recognized during the 1992 Earth Summit held in Rio de Janeiro (United Nations 1992).

Environmental Impact Assessment can be broadly defined as the systematic identification and evaluation of the potential impacts (effects) of proposed projects plans, programmes or legislative actions relative to the physical – chemical, biological, cultural and socioeconomic components of the total environment (*Canter*, 1996). EIA is a planning tool that is now generally accepted as an integral component of sound decision-making. The objective of EIA is to foresee and address potential environmental problems/concerns at an early stage of project planning and design. EIA systematically examines both beneficial and adverse consequences of the project and ensures that these effects are taken into account during project design.

It helps to identify possible environmental effects of the proposed project, proposes measures to mitigate adverse effects and predicts whether there will be significant adverse environmental effects, even after the mitigation is implemented.

Environment may be defined differently depending upon the perspective of the definer. In the case of EIA, environment is usually considered to constitute three main subsystems:

1. Physical Environment (geology, topology, climate, water, air).
2. Biological Environment (terrestrial and aquatic communities, rare and endangered species, sensitive habitats, significant natural sites).
3. Socio-cultural Environment (population, land use, development activities, goods and services, public health, recreation, cultural properties, customs, aspirations).

Impact may be defined as the consequences of changes in the environment but it should not be confused with effect. For example, increase in river pollution due to the initiation of a new project is an effect while consequences of river pollution on human health, flora, fauna, etc. is the impact.

Assessment normally does not mean doing new science, but rather assembling, summarizing, organizing and interpreting pieces of existing knowledge, and communicating them so that an intelligent but inexpert policy-maker will find them relevant and helpful in their deliberations (*Munn*, 1979).

Environmental Impact Assessment can thus be defined as "the systematic process of identifying future consequences of a current or proposed action (IAIA).” EIA is both an art and a science. Management aspect in EIA is an art, whereas the technical analysis is based on the scientific principles.

EIA has been considered as a central management tool for achieving sustainable development supporting the notions of the **Brundtland Commission** (1987), which defined sustainable development as "development, which meets the needs of the present generation without compromising the ability of future generations to fulfill their needs." Consequently, the aims and objectives of EIA can be divided into two categories.

- The immediate aim of EIA is to inform the process of decision-making by identifying the potentially significant environmental effects and risks of development proposals.
- The ultimate (long term) aim of EIA is to promote sustainable development by ensuring that development proposals do not undermine critical resource and ecological functions or the well being, lifestyle and livelihood of the communities and peoples who depend on them.

Immediate objectives of EIA are to:

- Improve the environmental design of the proposal.
- Ensure that resources are used appropriately and efficiently.
- Identify appropriate measures for mitigating the potential impacts of the proposal.
- Facilitate informed decision making, including setting the environmental terms and conditions for implementing the proposal.

Long term objectives of EIA are to:

- Protect human health and safety.
- Avoid irreversible changes and serious damages to the environment.
- Safeguard valued resources, natural areas and ecosystem components.
- Enhance the social aspects of the proposal.

Environmental impacts are also often categorized as primary or secondary. Primary impacts are those that can be attributed directly to the proposed action. If the actions involve construction of a facility, such as a wastewater treatment plant or a residential colony, the primary impacts of the action would include the environmental impacts related to the construction and operation of the facility and land use changes at the facility site.

Secondary impacts are indirect or induced changes, typically including associated investments and changed patterns of social and economic activities likely to be stimulated or induced by the proposed action. If the action involves the construction of a facility, the secondary impacts would include the environmental impacts related to induced changes in the pattern of land use, population density, and related effects on air and water quality or other natural resources (*Rau*, 1980).

The three core values of any EIA study[1] that have been identified till date are:

1. **Integrity:** The EIA process should be fair, objective, unbiased and balanced.
2. **Utility:** The EIA process should provide balanced, credible information for decision-making.
3. **Sustainability:** The EIA process should result in environmental safeguards which are sufficient to mitigate serious adverse effects and avoid irreversible loss of resource and ecosystem functions.

[1] The Manual in Perspective, EIA Training Resource Manual, UNEP, 2002, p 110

1.2 Historical Background of EIA

Our understanding of the connections between human life and other elements of nature is limited. However, we also have the power to destroy the natural systems that sustain us. Our capacity for destruction is illustrated through the deterioration of the ozone layer, through the extinction of species, and through mass deforestation and desertification that has happened in the past few decades. To realize that all of this has happened unknowingly and unintentionally, only adds to our capacity to destroy the Earth System. In many parts of the world, economic development projects directed at improving levels of material comfort have had unintended detrimental effects on people and natural resources.

Water, land, and air have been degraded to the point where they can no longer sustain existing levels of development and quality of life. With inadequate environmental planning, human activities have resulted in the disruption of social and communal harmony, the loss of human livelihood and life, the introduction of new diseases, and the destruction of renewable resources. These and other consequences can negate the positive benefits of economic development.

This was realized by the people of United States (US), when such problems had first started affecting the quality of their life. Consequently, the environmental concerns of the present day are often attributed to the environmental movement that had taken shape in US, in the early sixties. Popular support apart, the success of the environmental movement in the US is reflected in the forests and wild areas it helped set aside as well as in the laws it got enacted. Having protected large chunks of wilderness from the threat of ‘development’, the American environmental movement had then turned its attention to controlling the hazardous by-products of industrialization: air and water pollution, and the production of toxic or radioactive wastes (Guha, 2000).

At this stage, the "*Silent Spring*" book was published by Rachel Carson – a marine biologist, which took social awareness towards environmental issues to its next level. Born in the wake of such elevated concern about environmental pollution, the U.S. Environmental Protection Agency opened its doors in Washington, D.C., on December 2, 1970. Even before this, the National Environmental Policy Act (NEPA, 1969) of the United States of America was constituted and for the first time, **EIA** requiring environmental consideration in large-scale projects was enforced as legislation. Since then, EIA has been one of the successful environmental policy innovations of the 20th century.

The phrase Environmental Impact Assessment comes from Sec. 102 (2) of the National Environmental Policy Act (NEPA) – 1969, USA. NEPA ushered in a new era of environmental awareness by requiring federal agencies to include environmental protection in all their plans and activities. And it created the environmental impact statement for assessing the likely effects of projects that agencies intend to build, finance or permit. NEPA also provided the interested and affected public with one of its most important tools – the right to bring a case to court.

Until NEPA was enacted, it was very difficult to persuade the courts to hear cases involving environmental issues such as land-use changes. Litigation during the 1960s and 1970s established that any adverse effect to even a non-economic value (viz. aesthetic, conservational, recreational, etc.) could be taken to court. Although the effectiveness of NEPA is often questioned, it is largely agreed that NEPA made a significant difference in environmental decision-making at the highest level.

The influence of NEPA (1969), which had the concept of 'EIA system' as its bedrock, was extended beyond the US and provoked the introduction of EIA policy in many countries in Europe, Asia and elsewhere.

Figure 1 NEPA Process

In the more than two decades since the passage of NEPA, nations around the world, international lending agencies, and multilateral development organizations have initiated similar requirements for assessing and managing impacts upon the environment of the developing activities. By the middle of the last decade, EIA had become a requirement in more than 100 countries (Canter 1996). In many European countries, it came into vogue with the introduction of the concept of sustainable development after the World Commission of Environment in 1987. In India, EIA came into existence around 1978-79 and was made mandatory only in 1994.

Table 1 History and Evolution of EIA[2]

Evolution of Environmental Impact Assessment	
Pre - 1970	• Projects review based on technical/engineering and economic analysis. • Limited consideration given to environmental consequences.
Early/Mid – 1970s	• EIA introduced by NEPA in 1970 in US. • Basic principle: Guidelines, procedures including public participation requirement instituted. • Standard methodologies for impact analysis developed (e.g. matrix, checklist and network). • Several other countries adopt NEPA-based approach (e.g., Canada, Australia, New Zealand) • Major public inquires (rather than court litigations) help shape the process's development.
Late 1970s to early 1980s	• More formalized guidance (e.g., CEQ guidelines) • Other industrial and developing countries introduced formal EIA requirements and began to use the process informally or experimentally. • Use of EA by developing countries (Brazil, Philippines, China, Indonesia) • Social Impact Assessment (SIA), risk analysis included in EA processes • Greater emphasis on ecological modeling, prediction and evaluation methods. • Environmental inquiries in several countries encompass policy review aspects.

[2] Sadler. B., '*International Study of the Effectiveness of Environmental Assessment*', Final Report, Environmental Assessment in a Changing World, June 1996.

	• Coordination of EA with land use planning processes.
Mid 1980s to end of decade	• EC Directive on EIA establishes basic principles and procedural requirements for all member states. • Increasing efforts to address cumulative effects. • Development of follow-up mechanisms (e.g., compliances and effects monitoring, auditing, impact management). • Ecosystem and landscape level approaches applied (e.g., to assess wetland losses). • World Bank and other international lending and aid agencies establish EA requirements. • Increasing number of developing countries carry out EAs (e.g., in Asia).
1990s	• Requirement to consider trans-boundary effects under Espoo Convention[3]. • EIA identified as implementing mechanism for UN conventions on climate change and biological diversity. • SEA systems established by increasing number of countries mediation incorporate into EA requirements (still limited). • Sustainability principles and global issues receive increased attention (some EA guidance but still limited) • Increasing use of GIS and other information technologies. • Application of EA to international development activities more widespread.

[3] Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991)

1990s (contd.)	• Greater corporate use of EA, including screening investment and loan decisions and undertaking site and property assessment to establish liabilities. • Rapid growth in EA training, networking and cooperation activities. • Enactment of EA legislation by many developing countries.

Evolution of EIA can thus be divided into four overlapping phases[4].

1) Introduction and early development (1970 -1975) – mandate and foundations of EIA established in the USA; then adopted by a few other countries (e.g. Australia, Canada, New Zealand); basic concept, procedure and methodology still apply.
2) Increasing scope and sophistication (mid '70s to early '80s) – more advanced techniques (e.g. risk assessment); guidance on process implementation (e.g. screening and scoping); social impacts considered; public inquiries and reviews drive innovations in leading countries; take up of EIA still limited but includes developing countries (e.g. China, Thailand and the Philippines).
3) Process strengthening and integration (early '80's to early '90s) – review of EIA practice and experience; scientific and institutional frameworks of EIA updated; coordination of EIA with other processes, (e.g. project appraisal, land use planning); ecosystem-level changes and cumulative effects begin to be addressed; attention given to monitoring and other follow-up mechanisms.

[4] EIA Training Resource Manual (UNEP) (Second Edition 2002)

Many more countries adopt EIA; the European Community and the World Bank respectively establish supra-national and international lending requirements.

4) Strategic and sustainability orientation (early ’90s to date) EIA aspects enshrined in international agreements; marked increase in international training, capacity building and networking activities; development of strategic environmental assessment (SEA) of policies and plans; inclusion of sustainability concepts and criteria in EIA and SEA practice; EIA applied in all OECD countries and large number of developing and transitional countries.

1.3 EIA and Some International Organizations

Once the concept of EIA and its importance in protecting the environment was realized, it soon became an essential requirement and was incorporated into the framework of several international organizations. Some of these organizations were directly involved in funding developmental projects in developing countries. Thus, with the advent of EIA, a direct policy based intervention in the developmental activities of the developing as well as developed countries could be made and official measures could be taken to stop or modify those projects which could lead to serious environmental problems; at the local level or at the global level.

International efforts are usually classified into the following four areas:

1. Legally binding international documents such as international treaty and protocol.
2. Non-legally binding international documents such as resolutions, recommendations and declarations by international organizations.
3. Guidelines for development assistance.
4. Guidelines for overseas projects.

Spurred by several recommendations by international organizations, particularly the Organization for Economic Cooperation and Development (OECD) and the European Union (EU), EIA had been prevailed throughout the world in 1980s. Apart from the United Nations Law of the Sea Treaty (adopted in 1982) many other international treaties and protocols with provisions relating to EIA were concluded in the 1990's e.g. Convention on Environmental Impact Assessment in a Trans-boundary context (the Espoo Convention of 1991), Protocol on Environmental Protection to the Antarctic Treaty (1991), Biodiversity Treaty (1992), United Nations Framework Convention on Climate Change (1992).

Following are some international organizations which first incorporated EIA as a mandatory requirement to carry out its activities.

1. Organization for Economic Co-operation and Development

The Organization for Economic Cooperation and Development (OECD) is an international organization that has been helping governments tackle the economic, social and governance challenges of a globalizing economy. The OECD "Declaration on Environmental Policy" (1974) was the first international document to incorporate EIA. This declaration was the follow up activities after the United Nations Conference on the Human Environment (1972) and it set the trend for environmental policy in OECD member countries. Article 9 of the declaration stated that it was critical that environmental impact of significant public or private activities be assessed prior to implementation. The oldest of recommendations and declarations concerning matters relating to EIA procedures was the OECD "Council Recommendation on Assessment of Projects which may have Significant Effects on the Environment" (1979).

In 1983, a special group “The Ad Hoc Committee on Environmental Assessment and Development Assistance” was established under the Environment Committee to examine EIA procedures, methods and implementation mechanisms while maintaining close relations with the Development Assistance Committee (DAC). In 1985, “Council Recommendation on Environmental Assessment of Development Assistance Projects and Programmes” which gave examples of EIA implementations and targets of EIA was adopted. In 1986, “Council Recommendations on Measures Required to Facilitate the Environmental Assessment of Development Assistance Projects and Programmes” concerning EIA procedures and organizational system were adopted. Then in 1989, checklist for possible use by high-level decision-makers in bilateral and multilateral development assistance institutions was drafted and was released as executive committee recommendations. Based on these three recommendations, DAC also adopted

- “Good Practices for Country Environmental Surveys and Strategies”,
- “Good Practices for Environmental Impact Assessment of Development Projects”,
- “Guidelines for Aid Agencies Involuntary Displacement and Resettlement in Developing Countries” , and
- “Guidelines for Aid Agencies on Global Environmental Problems” in 1991.

2. United Nations Environment Programme

The United Nations Environment Programme (UNEP) is the voice for the environment in the United Nations system. Activities of the United Nations began in 1982, with the adoption of World Charter for Nature at the United Nations General Assembly.

The Charter stated that EIA should be ensured to minimize adverse effects on nature and nature assessments should be included in the fundamental elements of all planning and should be publicly disclosed and deliberated. These stipulations led to the setting up of an EIA expert committee and common guidelines for the promotion of EIA. Finally, in 1987 the "Goals and Principles of Environmental Impact Assessment" were adopted. The thirteen rules stipulated in this aimed at the facilitation of introduction and promotion of EIA systems in member countries as well as promote development of international EIA procedure in order to address significant trans-boundary impacts on other countries.

3. European Commission (now European Union)

The EIA Directive (EU legislation) on Environmental Impact Assessment of the effects of projects on the environment was first introduced in 1985. This directive required a defined EIA to be implemented prior to official authorization for projects with potential significant environmental impact and required member countries to introduce formal EIA systems by 1988 in order to realize the above. From 1985, the provision of EIA systems in European countries has been progressed centering on the EU member countries.

4. World Bank

The World Bank (WB) is an exponent multilateral development bank that provides loan and finance to the developing countries and development assistance projects. The World Bank's "Environmental Policy and Procedures" adopted in 1984 stated the integration of environmental consideration at the initial stages of defining and preparation of a project.

Furthermore, in 1989 the WB established the Operation Directive: OD relating to EIA in order to outline the methods and procedures for EIA implementation in proposed projects to WB staff, and the related guidelines "Environmental Assessment Source Book", with the aim of providing sector specific manuals. The OD became an independent operational directive 4.01 in 1991 and was further revised in 1998.

1.4 Worldwide spread of EIA

Some thirty-seven years ago, there was no Environmental Impact Assessment of any kind for any project or activity. It was a time when development plans and projects were put into place *ad hoc*; some of which were often destructive to the environment and thereby endangered the very basis on which continuity and sustainability of development depends. But today, EIA is a formal process and is currently practiced in more than 100 countries. The EIA is the most widespread example of statutory requirement for the consideration of environmental effects of projects. EIA as a mandatory regulatory procedure originated in the early 1970s, with the implementation of the National Environment Policy Act (NEPA, 1969) in the US. A large part of the initial development took place in a few high-income countries, like Canada, Australia, and New Zealand (1973-74). However, there were some developing countries as well, which introduced EIA relatively early - Columbia (1974), Philippines (1978).

Among developing countries, the Asian countries started taking environmental measures very early, with many countries having an EIA system in place by the 1980's. On the other hand, the Latin American countries did not start making legislation until the latter half of the 1980's. Legislative moves in the developing African countries have become popular only in the late 1990s.

Table 2: Project Level EIA Legislation Year (1969 – 1995)

COUNTRY	LEGISLATION YEAR
United States of America	1969
Japan	1972
Canada	1973
New Zealand	1974
Australia	1974
Columbia	1974
Germany	1975
Brazil	1976
France	1976
Korea, South	1977
Philippines	1978
Papua New Guinea	1978
Taiwan	1979
China	1979
Sri Lanka	1980
Kuwait	1980
Israel	1982
Indonesia	1982
South Africa	1982
Mexico	1982
Pakistan	1983
Switzerland	1983
Thailand	1984
Belgium	1985
Russia	1985
Malaysia	1985
Spain	1986
Netherlands	1986
India	**1986**
Greece	1986
Gambia	1987
Sweden	1987
Portugal	1987
Italy	1988
Turkey	1988
United Kingdom	1988
Ireland	1988
Norway	1989

Poland	1989
Denmark	1989
Luxembourg	1990
Finland	1990
Antarctica	1991
Czech Republic	1991
Slovakia	1991
Estonia	1992
Lithuania	1992
Nigeria	1992
Argentina	1993
Albania	1993
Hungary	1993
Bolivia	1994
Chile	1994
Austria	1994
Armenia	1995
Iceland	1995
Uganda	1995

- Canada enacted EIA law in 1995. However, EIA was operational since 1973 according to a Government Directive.
- New Zealand enacted a new EIA system in 1991.

With the start of 1990's, amidst a background of high recognition relating to global environmental problems such as depletion of ozone layer, global warming and acid rain, the UN Conference on Environment and Development (Earth Summit) was held in Rio de Janeiro, Brazil (1992) and the Agenda 21 which aims at the realization of sustainable development, was adopted. According to the definition provided in the Rio Declaration (United Nations, 1992) a development is considered sustainable if it equitably meets the needs of present and future generations. Such needs encompass both the socio-economic and the environmental sphere.

A framework of appropriate tools is required to help making the concept of sustainability operational (Dalal-Clayton, 1992). Agenda 21, which is the plan of actions endorsed during the Rio Summit, explicitly identifies EIA as one of such tool (United Nations, 1992). Consequently, the concept of EIA has been gathering momentum ever since and is one of the most popular environmental policy framework and tool of the present day.

1.5 Common Stages in an EIA Process

The stages in an EIA process depend upon the requirements of the country, or donor organization and may also depend on the type of Project under investigation. However, most EIA processes have a common structure and the application of the main stages is a basic standard of good practice. Also, while some authors may use it differently, terms like Environmental Impact Statement (EIS), Environmental Statement (ES), Environmental Assessment Report (EA Report), Environmental Effects Statement (EES) almost always refer to Environmental Impact Assessment (EIA).

For instance, according to Canter (1996), an EA is a concise public document that serves to briefly provide sufficient evidence and analysis for determining whether to prepare an EIS or not. An EIS, according to him is a detailed written statement which serves as an action-forcing device to ensure that the policies and goals defined in the NEPA are infused into the ongoing programmes and actions of the government. And this entire process is included under the broad term Environmental Impact Assessment (EIA).

The environment impact assessment is usually carried out in eight steps; each of which has an equal importance in determining the overall performance of the project.

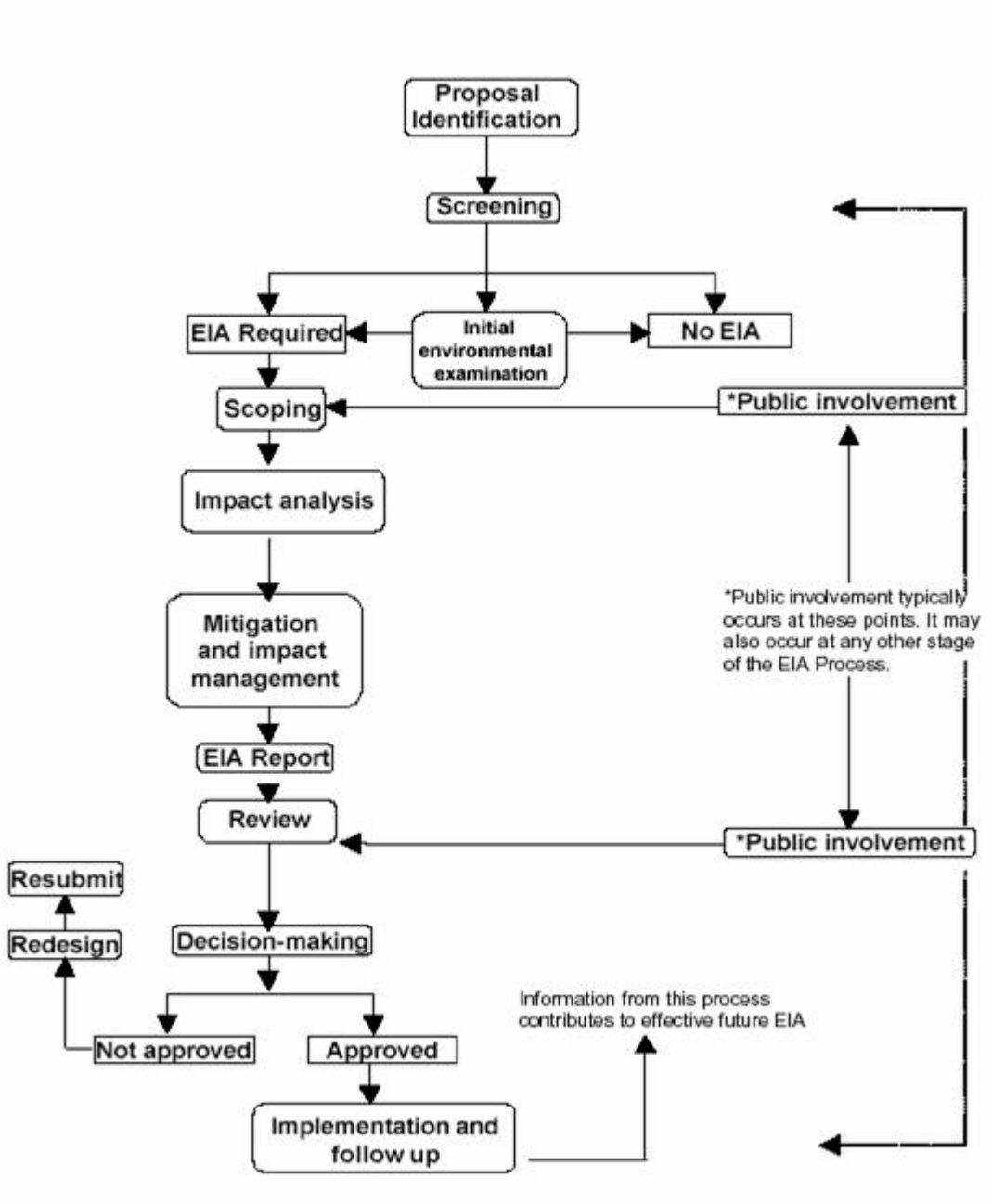


Figure 2 Flowchart showing the EIA Process

Typically, the EIA process begins with screening to ensure that time and resources are directed at the proposals that matter environmentally and end with some form of follow up on the implementation of the decisions and actions taken as a result of an EIA report. The eight steps of the EIA process are briefly presented below.

1) **Screening:** First stage of EIA, which determines whether the proposed project, requires an EIA and if it requires EIA, then the level of assessment required.
2) **Scoping:** This stage identifies the key issues and impact that should be further investigated. This stage also defines the boundary and time limit of the study.
3) **Impact analysis:** This stage of EIA identifies and predicts likely environmental and social impact of the proposed project and evaluates the significance.
4) **Mitigation:** This step in EIA recommends the actions to reduce and avoid the potential adverse environmental consequences of development activities.
5) **Reporting:** This stage presents the result of EIA in a form of a report to the decision-making body and other interested parties.
6) **Review of EIA:** It examines the adequacy and effectiveness of the EIA report and provides information necessary for the decision-making.
7) **Decision-making:** It decides whether the project is rejected, approved or needs further change.
8) **Post monitoring:** This stage comes into play once the project is commissioned. It checks whether the impacts of the project do not exceed the legal standards and implementation of the mitigation measures are in the manner as described in the EIA report.

1.6 EIA: Misconceptions and counter arguments

When the concept of EIA was first made a legal obligation it had encountered resistance on the part of many planners and engineers through out the world. Such resistance saw EIA as an unneeded change to traditional practices and was often ignorant of its intended role in improving the project planning process. EIA is still severely criticized in some parts of the developing world as being inappropriate for application there. Following are some of these fears and misconceptions pertaining to EIA.

1. "EIA is too complex"

This is not true. EIA is a simple process. Sometimes, however, the potential impacts can be complex and therefore difficult to quantify. The degree to which you must investigate these questions as part of the planning process must be relative to the overall significance of the impacts.

2. "EIA is too expensive"

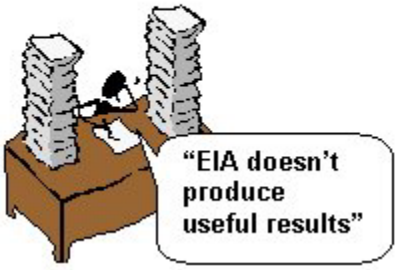
This is not true. Costs of EIA are commonly around 1%, sometimes up to 5% in complex cases of project costs, often within normal variability of project costs. In contrast, EIA often results in cost saving through reduced changes to the project at later stages, or through identification of easier and more efficient ways to meet project goals.

3. "EIA will be misused to stop development"

There have been cases where EIA has been misused to stop development. However, this does not invalidate the use of EIA; it indicates a problem with how it is being coordinated. A properly carried out EIA process is much more likely to generate support for development.

4. "We are too poor to afford EIA"

This is never true. No country is "too poor" to do its planning properly. Bad planning means failing projects and these are often projects paid for by the country through development loans. Bad planning means lack of sustainability. Bad planning means extra costs to society. Poor countries can't afford such costs. May be wealthy, developed countries can arguably afford to waste and destroy resources, but poor ones definitely can't. EIA is therefore even more important for developing countries than for developed ones.



5. "EIA doesn't produce useful results"

Often this has been true. This can be due to lack of a practical focus, and/or poor training of practitioners. When carried out properly, EIA is a valuable part of project planning.

6. "EIA is just an add-on and occurs too late to do any good"

EIA certainly has less value if done too late in the project cycle; it must be done early enough so that results can be incorporated into the detailed design. If EIA is done too late, costs for redesign of the project can be high, and/or the EIA is ignored.

7. "EIA delays projects"

If carried out properly, EIA should no more delay projects than any part of the planning process. It should be done in parallel with other activities.

1.7 World Wide Effectiveness of EIA

"Has environmental (impact) assessment achieved its goal of helping…reach better decisions? This is the fundamental question that all practitioners must begin to address systematically."

- Dorais (1993)

Environmental Impact Assessment has become one of the most widely used tools for making development sustainable. It acts as a primary vector for introducing environmental considerations and a wider suite of environmental management tools into development planning and decision-making world wide. The effectiveness of EIA has therefore been an overreaching and integral theme of EIA theory and practice. Simply put, the term 'effectiveness' refers to whether something works as intended and meets the purpose(s) for which it is designed.

One of the first such EIA effectiveness study titled "International Study of the Effectiveness of Environmental Assessment (EA)" was carried out and formally concluded at the Annual Conference (1996) of International Association of Impact Assessment (IAIA) in Lisbon during June 18-22, 1996. A final report, together with companion documents on SEA and project EIA, were tabled as part of the information base for conference discussion. How well does EA work in practice? When and where has it made a difference to development planning and decision making? These and related issues of EA effectiveness and performance were addressed, beginning with a broad historical perspective. Various methods were used to take stock of the contemporary status of EA practice. These included a questionnaire survey of members of IAIA and other EIA networks. Case studies from all over the world were also taken into account.

The study looked back at the 25 years of EIA practice which revealed a record of considerable progress, overlooked in other critical analyses reports. The key developments that were declared in the concluding report of the International Study of the Effectiveness of Environmental Assessment (1996) were:

- The world-wide spread of EIA to over 100 countries;
- A progressive extension in the scope of EIA application;
- Continued innovations in law, procedure and method; and
- The recent specification of EIA as an implementing mechanism for international agreements related to global change.

Case studies confirmed that well founded assessments had helped realize a range of direct and indirect benefits; viz. early withdrawal of environmentally unsound proposals, 'greening' project design and planning, catalyzing policy and institutional reforms and serving as an educational and awareness raising mechanism. Public participation and scrutiny, as well as having well documented reports, helped guarantee that EIA reports were taken into account in political decision-making.

However, the EIA process was widely recognized as having areas of weakness and as falling short of realizing its potential as a tool for sustainability assurance. A critical limitation of EIA was realized in addressing cumulative effects and large scale changes - the ecological currency of unsustainable development. Ultimately, it was felt that these deficiencies can be addressed only by larger policy and planning reforms. Thus, policies such as Strategic Environmental Assessment (SEA), etc. are being researched and applied at different stages of development activities. However, EIA is still the most popular environmental impact assessment tool till the present day.

2. Environmental Impact Assessment (EIA) in India

2.1 Historical perspective

The concept of environmental protection and resource management has traditionally been given due emphasis and woven in all facets of life in India. These age-old practices teach people to live in perfect harmony with nature. Nevertheless, changing life styles, increasing pace of urbanization, industrialization and infrastructure development have caused environmental pollution and degradation (Chopra et al., 1993). This degradation of the natural environment has further been accelerated by the large number of developmental projects most of which are setup at considerable environmental costs. Consequently, rules, laws and policies on environmental protection had to be introduced.

It is desirable to ensure that the development options under consideration are sustainable. In doing so, environmental consequences must be characterised early in the project cycle and accounted for in the project design. This can be ensured by carrying out a proper Environmental Impact Assessment (EIA). An EIA is used to foresee the potential environmental problems that would arise out of a proposed development and address them in the project's planning and design stage. The EIA process should then allow for the communication of this information to

a) the project proponent;
b) the regulatory agencies; and
c) all stakeholders and interest groups.

so as to achieve the ultimate goal of ensuring sustainable development of a country’s industrial and development growth by taking the people along.

EIA integrates the environmental concerns in the developmental activities right at the time of initiating for preparing the feasibility report. In doing so it enables the integration of environmental concerns and mitigation measures in project development. EIA can often prevent future liabilities or expensive alterations in project design.

The foundation of environmental impact assessment (EIA) in India was laid in 1976-77 when the Planning Commission asked the then Department of Science and Technology (DST) to examine the river-valley projects from environmental angle. This was subsequently extended to cover those projects, which required approval of the Public Investment Board. However, these were administrative decisions, and lacked the legislative support. To fill this gap, the Government of India enacted the Environment (Protection) Act (EPA) on 23rd May 1986. To achieve the objectives of the Act, one of the decisions that were taken was to make EIA statutory. On 27 January 1994, the Union Ministry of Environment and Forests (MoEF), Government of India, under the Environmental (Protection) Act 1986, promulgated an EIA notification making Environmental Clearance (EC) mandatory for expansion or modernization of any activity or for setting up new projects listed in Schedule 1 of the notification. Since then there have been about twelve amendments made in the EIA notification of 1994.

The MoEF recently notified new EIA legislation in September 2006. The notification makes it mandatory for various projects such as mining, thermal power plants, river valley, infrastructure (road, highway, ports, harbours and airports) and industries including very small electroplating or foundry units to get environment clearance. However, unlike the EIA Notification of 1994, the new legislation has put the onus of clearing projects on the state government depending on the size/capacity of the project.

Table 3 Comparison of EIAs world over

EIA in Developed Countries	EIA in Developing Countries	EIA in India
Well-framed EIA legislation in place. For instance, in Canada, Canadian Environmental Assessment Act regulates EIA while EU countries are guided by Directive on EIA (1985).	Lack of formal EIA legislation in many developing countries. For instance, EIA is still not mandatory in many African countries	Formal legislation for EIA. It has been enacted by making an amendment in the Environment Protection Act 1986.
In developed countries, active involvement of all participants including competent authority, government agencies and affected people at early stages of the EIA. This makes the process more robust and gives a fair idea of issues, which need to be addressed in the initial phase of EIA.	Limited involvement of public and government agencies in the initial phases. This often results in poor representation of the issues and impacts in the report, adversely affecting the quality of the report.	Limited involvement of public and government agencies in the initial phases.
Integrated approach to EIA followed. All aspects including social and health taken into account.	Mainly environmental aspects considered. Poor on social or health aspects.	No provision in place to cover landscape and visual impacts in the Indian EIA regulations

Expertise in EIA: The International Association for Impact Assessment (IAIA) and other organizations demonstrate that there are a large number of individuals with the capability to design, conduct, review and evaluate EIAs from countries of the North. The major portion of teaching about environmental assessment also takes place in industrial countries.	The expertise in EIA is slowly developing. In most cases, students from the developing countries go to the developed countries to gain knowledge of the subject.	Expertise in this area is developing.
The process of screening is well defined. For instance, in EU countries competent authorities decide whether EIA is required after seeking advice from developer, NGO and statutory consultees. In Japan, screening decision is made by the authorizing agency with respect to certain criteria.	In developing countries, screening practice in EIA is weak. In most cases, there is a list of activities that require EIA but without any threshold values.	Screening done on the basis of a defined list. Threshold values on the size of the project has been used to decide whether the project will be cleared by the state government or the central government.

A multi-disciplinary approach. Involvement of expert with expertise in different areas.	Lack of trained EIA professionals often leads to the preparation of inadequate and irrelevant EIA reports in developing countries	Same in India. Preparation of EIA is done by consultants. Therefore, the selection criterion for the organization is fees/cost rather than the expertise of EIA team.
Scoping process is comprehensive and involves consultation with all the stakeholders. In many countries like US, Netherlands, Canada and Europe, the involvement of the public and their concern are addressed in the scoping exercise. Besides this, funding organizations such as World Bank, ADB and ERDB have provision for consultation with the affected people and NGOs during identification of issues in scoping exercise.	Scoping process in most developing countries is very poorly defined. In many countries including China, Pakistan, etc. there is no provision for scoping. In countries where it is undertaken, there is no public consultation during scoping. Moreover, in most developing countries, scoping is often directed towards meeting pollution control requirements, rather than addressing the full range of potential environmental impacts from a proposed development.	Earlier scoping was done by consultant or proponent with an inclination towards meeting pollution control requirements, rather than addressing the full range of potential environmental impacts from a proposed development. However, the new notification has put the onus of scoping on the expert committee based on the information provided by the proponent. Consultation with public is optional and depends on the discretion of the expert committee.

Proper consideration of alternatives in EIA	The consideration of alternatives in developing countries is more or less absent.	Same as developing countries
Most reports in local language	Most reports in English and not in the local language.	Most reports in English and not in the local language. In some case, executive summary is translated into local language.

2.2 Evolution of EIA in India

Environmental issues in India were center staged immediately after the Stockholm conference of 1972 and the National Committee on Environmental Planning and Coordination (NCEPC) was constituted, under the Department of Science and Technology (DST) (Valappil et al., 1994). The then Planning Commission had directed the NCEPC to undertake EIA of major development projects to weigh the pros and cons of these activities on the environment. Later, the Department of Environment (DoE) was established as per the recommendation of the NCEPC, in 1980, which was finally converted to a full-fledged Ministry of Environment and Forests (MoEF) five years later (Rao, 1997). The MoEF first enacted the EPA in 1986, which was understood to be an umbrella act covering various environmental aspects. Under EPA (1986) an EIA notification was brought out, making EIA mandatory for a particular group of activities.

This notification not only specified the type of activities requiring EIA but also fixes a time schedule for the whole process. It also went on to define the role of the MoEF in the whole process. The formal EIA notification was promulgated on 27 January, 1994. One of the major amendments was made in 1997 with the introduction of the public hearing procedure. It outlined the process of conducting public hearing, from submission of report to State Pollution Control Board (SPCB) to the specification for public hearing notice, composition of the hearing panel and time period for the completion of public hearing process.

The EC process is also subjected to the stipulated standards in the Water (Prevention and Control of Pollution) Act, 1974; Air (Prevention and Control of Pollution) Act, 1981; Noise Pollution (Regulation and Control) Rules, 2000, to provide prescribed limit of the pollutants which a particular activity may release to the environment. The Hazardous Wastes (Management and Handling) Rules, 1989 and Forest (Conservation) Act, 1980, are other major acts that have bearings on EC practice. In addition, state governments may have stringent regulations based on their local conditions, but these should be consistent with national laws, regulations and standards. The existing EC process is a two-tier system involving both central and state authorities. At central level, Impact Assessment division (IA) under MoEF, regional offices of MoEF and Central Pollution Control Board (CPCB) are three important institutions, whereas SPCBs and state Departments of Environment (DoE) are working at the province level.

2.3 EIA in Action

The EIA process is now well established and EC has been provided to over 2800 development projects till date (Table 3). The India of today is on the expressway to development. Such is country's economy today that India is often thought to be developing among developed countries but developed among developing countries. Consequently, the number of projects that are received by the MoEF for obtaining clearance have also increased over the years. Thus, this transition from developing to a developed nation that India is trying to bring about has considerable environmental and social costs.

Realizing this changing paradigm, the MoEF recently notified a new EIA legislation in September 2006. The notification makes it mandatory for various projects such as mining, thermal power plants, river valley, infrastructure (road, highway, ports, harbours and airports) and industries including very small electroplating or foundry units to get environment clearance. However, unlike the EIA Notification of 1994, the new legislation has put the onus of clearing projects on the state government depending on the size/capacity of the project. Certain activities permissible under the Coastal Regulation Zone Act, 1991 also require similar clearance. Additionally, donor agencies operating in India like the World Bank and the Asian Development Bank (ADB) have a different set of requirements for giving environmental clearance to projects that are funded by them.

Apart from this, any project located in a critically polluted area, within a radius of 15 kilometers of the boundary of reserved forests, ecologically sensitive areas, which include national parks, sanctuaries, biosphere reserves; and any State, has to obtain environmental clearance directly from the Central Government irrespective of its project categorization.

Table 4 EIAs cleared by MoEF in different sectors since 1994 till mid 2006

PROJECTS → / ↓ YEAR	River Valley Projects	Industrial Projects	Thermal Power Projects	Mining Projects[α]	Other Sectors[β]	Total
1994	8	20	15	13+24	24	104
1995	13	55	13	19+51	29	180
1996	6	54	26	39+15	30	170
1997	4	98	39	7+17	21	186
1998	9	34	17	9	11	80
1999	5	45	17	25	12	104
2000	5	52	15	17	36	125
2001	12	63	14	9	23	121
2002	12	83	7	31	25	158
2003	16	220	5	19	55	315
2004	8	165	27	62	24	286
2004-06	30	559	42	302	89	1022
					Total	**2851**

Source: MoEF, Annual reports (1994–2006).

α Environmental clearance + site clearance.

β Include transport, ports, harbours, airports, highways and communication projects.

2.4 Environmental Impact Assessment Notification, 2006

India, as already stated is on the expressway to development. Rapid industrialization and an upsurge in the number of development projects all over the country is often accompanied with massive environmental and social burdens, principally borne by communities living in the vicinity of project sites. Monitoring tools like Environment Impact Assessment (EIA), therefore, assume great significance in ensuring sound economic development without compromising on environmental and social costs.

It is believed that everybody, from the Prime Minister of the country to a local villager in some remote part of the country is interested in the Environmental Clearance (EC) process, since everyone is directly and indirectly affected by it. With this at the backdrop, the Planning Commission's Approach Paper on the 11th Five-Year Plan had stated that 'the country's environmental clearance regulations are beginning to resemble the old license-permit raj and were in need of urgent reform'. The concern expressed by this policy formulating body reflected the governmental apathy towards such a critical issue in the last few years. To address this issue and to address the limitations in the old EIA Notification (1994), the Union Ministry of Environment and Forests (MoEF) notified the new EIA Notification in September 2006 after putting up the draft notification for public comment for a year.

The new notification has brought in more number of projects within the purview of the environmental clearance process. As a result, a revised list of those projects and activities has been prepared which require prior environmental clearance. Most importantly, the categorization of projects requiring EIA is now no longer based on investment. Instead, the size or capacity of the project, according to the new notification, determines whether it is to be cleared by the central or state government.

2.4.1 EIA Notification, 1994

As already stated, the environment impact process was integrated into the Indian legal system in 1994 when Environment Impact Assessment (EIA) Notification had first come into existence. The objective of the Notification was to push for more sustainable industrialization process in the country after giving due consideration to environmental and social impacts. For doing so, the notification imposed restrictions on setting up, modernizing or expanding any new project or proposal without getting an environmental clearance from the government.

The notification specified the type of project/proposal that needed environmental clearance and thus would have to conduct the EIA. The Act also made it mandatory for all projects listed in Schedule 1 to get an environmental clearance directly from the Central Government for setting or expanding any plant in any state in the country. It also listed a number of projects/proposals, which were exempted from the environment clearance process or public hearing.

The notification had also made provisions for formation of an Impact Assessment Agency (IAA), to comprise experts for review of the documents submitted to the MoEF for clearance. It defined the roles and responsibilities of the IAA and fixed time frame for various stages of the environmental clearance process. The notification also made the provision for the proponent to reapply in case its EIA report was rejected due to lack of data. It, however, placed a penalty of automatic rejection in case of misrepresentation and concealing of factual data. However still, the notification was largely thought to be **cumbersome** and **time consuming**. To investigate such drawbacks in the 1994 EIA Notification, MoEF conducted a comprehensive review of the EC process laid down in the said notification, under the Environmental Management Capacity Building Project in 2001. This study by the MoEF brought out the need for immediate reforms.

A Committee was also set up by the then Cabinet Secretariat, with Shri V. Govindarajan as convener, to examine extant procedures for investment approvals and implementation of projects and to suggest measures to simplify and expedite the process of both public and private projects. The committee pointed that the then Environment Clearance perhaps takes the longest time and causes maximum delay to projects.

Some of the constraints identified in the EC Process under the EIA Notification, 1994 by the Govindarajan Committee are as under:

- Cumbersome procedure
- Disproportionate details sought with applications
- Delay in appraisal meetings
- Time consuming and requiring undue effort
- Reopening of technical issues during various stages of appraisal
- Poor quality of EIA studies by consultants
- Delays by other concerned agencies

As against the EIA Notification of 1994, the objectives of the proposed Notification were to formulate a **transparent, decentralized and efficient regulatory mechanism** which would further:

- Incorporate necessary environmental safeguards at planning stage
- Involve stakeholders in the public consultation process
- Identify developmental projects based on impact potential instead of the investment criteria

2.4.2 Amendments in the EIA Notification, 1994

Even before it was thought to completely revise the EIA Notification of 1994, the latter was amended twelve times in eleven years of its existence. While most of the amendments were blamed to have diluted the process of environmental clearance, there were some, which also strengthened the process. Some of the key amendments are discussed as follows:

- **Amendment on April 10, 1997:** The process of environmental public hearing (EPH) was introduced in the environmental clearance process. The SPCBs were entrusted to conduct public hearing to get the views and concerns of the affected community and interested parties for the proposed project. The SPCBs were entrusted with forming an EPH committee to ensure fair representation in the public hearing process. This amendment also made some changes with reference to the environmental clearance required for power plants.

- **Amendment on June 13, 2002:** This amendment diluted the purpose of the notification exempting many industries from the EIA process or from the entire environment clearance process on the basis of level of investment.
    - It exempted pipeline and highway projects from preparing the EIA report, but these projects would have to conduct public hearings in all the districts through which the pipeline or highway passes.
    - A number of projects were totally exempted from the Notification if the investment was less than Rs. 100 crore for new projects and less than Rs. 50 crore for expansion/modernization projects.
    - Most of the industries exempted from the clearance process had a very high social and environmental impact even if the investment was less than Rs 100 crore.

For example, in case of hydel power projects, irrespective of the investment, there will be social impacts due to displacement.

- No EIA was required for modernization projects in irrigation sector if additional command area was less than 10,000 hectares or project cost was less than Rs. 100 crore.

- **Amendment on 28th February, 2003:** This amendment added a little tooth to the notification. It took into consideration location-sensitivity into the environment clearance process. This amendment prohibited certain processes and operations in specified areas of the Aravalli Range.

- **Amendment on 7th May 2003:** The notification was amended to expand the lists of activities involving risk or hazard. In this list, river valley projects including hydel power projects, major irrigation projects and their combination including flood control project except projects relating to improvement work including widening and strengthening of existing canals with land acquisition up to a maximum of 20 meters, (both sides put together) along the existing alignments, provided such canals does not pass through ecologically sensitive areas such as national parks, sanctuaries, tiger reserves and reserve forests.

- **Amendment on August 4th 2003:** This amendment was similar to the one in February 2003 that tried bringing in location-sensitivity in the entire environmental clearance process. Any project located in a critically polluted area, within a radius of 15 kilometers of the boundary of reserved forests, ecologically sensitive areas, which include national parks, sanctuaries, biosphere reserves; and any State, had to obtain environmental clearance from the Central Government.

- **Amendment on September 2003:** Site clearance was made mandatory for green field airport, petrochemical complexes and refineries. Moreover, the amendment added that no public hearing was required for offshore exploration activities, beyond 10 km from the nearest habitation, village boundary and ecologically sensitive areas such as, mangroves (with a minimum area of 1,000 sq. m.), corals, coral reefs, national parks, marine parks, sanctuaries, reserve forests and breeding and spawning grounds of fish and other marine life.

- **Amendment on July 7th, 2004:** It made EIA mandatory for construction and industrial estate.

- **13th Amendment on 4th July 2005:** The amendment provided that projects related to expansion or modernization of nuclear power and related project, river valley project, ports, harbours and airports, thermal power plants and mining projects with a lease area of more than five hectares could be taken up without prior environmental clearance. The Central Government in the Ministry of Environment and Forests may, on case to case basis, in public interest, relax the requirement of obtaining prior environmental clearance and may, after satisfying itself, grant temporary working permission on receipt of application in the prescribed format for a period not exceeding two years, during which the proponent shall obtain the requisite environmental clearance as per the procedure laid down in the notification. The grant of temporary working permission would not necessarily imply that the environmental clearance would be granted for the said project.

Despite these amendments from time to time, there was a wide spread opinion that the EIA notification (1994) was not able to address all the concerns and had several weaknesses which was making the entire clearance process weak. Therefore, the Union Ministry of Environment and Forests (MoEF) initiated the process of bringing in some significant modifications in the environment clearance process. A draft notification was published on September 15, 2005 and was put up for public comment for a year and has recently been notified in September 2006.

2.4.3 EIA Notification of 1994 and 2006: A comparison

The new EIA notification was introduced by the Ministry of Environment and Forests (MoEF) on September 14 2006. This was an year after the draft notification was placed on the MoEF website, in response to which, comments were sent by several groups and organizations. The major difference in the New EIA Notification 2006 from the earlier one (1994) is its attempt to decentralize power to the State Governments. Earlier all the projects under Schedule 1 went to the Central Government for Environmental Clearance. However, as per the new notification, significant number of projects will go to the state for clearance depending on its size/capacity/area. For this, the notification has made a provision to form an expert panel, the Environment Appraisal Committees at the State level (SEAC). This is a good attempt to reduce the burden on the Central Government.

However, this provision can be misused in many cases especially in those cases where the state governments are actively pursuing industrialization for their respective states. The new notification has also failed to mention if there would be some sort of monitoring of state level projects by the Central Government. The new notification also realizes the importance of 'Scoping', which was not at all properly addressed in the earlier notification.

Table 5 Major differences in New EIA notification 2006 and old notification (1994)

	EIA Notification, 2006	EIA Notification, 1994 (with amendments)
1.	Projects in Schedule-1 have been divided into two categories, Category A and B. Category A project will require clearance from Central Government (MoEF). Category B will require clearance from State Government. However, the state government will first classify if the B project falls under B1 or B2 category. B1 projects will require preparation of EIA reports while remaining projects will be termed as B2 projects and will not require EIA report. This has the potential of being a good move as decentralization of power may speed up the project clearance process. However, it may be misused and there is an urgent need to build the capacity of the state regulators to deal with their new responsibilities.	Proponent desiring to undertake any project listed in Schedule-1 had to obtain clearance from the Central Government.

2.	Well defined screening process with projects divided into two categories: Category A: All projects and activities require EIA study and clearance from central government. Category B: Application reviewed by the State Level Expert Appraisal Committee into two categories - B1 (which will require EIA study) and B2, which does not require EIA study.	In screening, the project proponent assesses if the proposed activity/project falls under the purview of environmental clearance, than the proponent conducts an EIA study either directly or through a consultant
3.	Scoping has been defined in the new Notification. However, the entire responsibility of determining the terms of reference (ToR) will depend on the Expert Appraisal Committee (EAC). This will be done in case of Category A and Category B1 projects. The finalization of ToR by the EACs will depend on the information provided by the project proponent. There is however a provision that the EACs may visit the site and hold public consultation and meet experts to decide the ToR. However, if the EACs do not specify the ToR within 60 days, the proponent can go ahead with their own ToR.	Scoping was not applicable. The terms of reference was completely decided by the proponent without any public consultation.

	The final ToR shall be displayed on the website of the Ministry of Environment and Forests and concerned State / Union Territory Environment Impact Assessment Authority (SEIAA).	
4	Public Consultation- All Category A and Category B1 projects or activities have to undertake public consultation except for 6 activities for which public consultation has been exempted. Some of the projects exempted include expansion of roads and highways, modernization of irrigation projects, etc. Some of these may have potential social and environmental impact. The responsibility for conducting the public hearing still lies with the state PCBs. Member- Secretary of the concerned State Pollution Control Board or Union Territory Pollution Control Committee has to finalize the date, time and exact venue for the conduct of public hearing within 30 days of the date of receipt of the draft Environmental Impact Assessment report, and advertise the same in one major National Daily and one Regional vernacular Daily.	The project proponent has to write to State Pollution Control Board to conduct public hearing. It was the responsibility of the State Boards to publish notice for environmental public hearing in at least two newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned.

	A minimum notice period of 30 days will be given to the public for furnishing their responses. The public consultation will essentially consist of two components – a public hearing to ascertain the views of local people and obtaining written responses of interested parties. There are no clear guidelines like in earlier Notification who all can attend the public hearing. The use of “local people” for public hearing raises doubt if the hearing can be attended by interested parties like NGOs, experts, etc or is restricted to only locals. Is the role of NGOs/experts limited to the sending written letters/feedback to the PCB? The Notification makes provision that Ministry of Environment and Forest shall promptly display the Summary of the draft Environment Impact Assessment report on its website, and also make the full draft EIA available in Ministry’s Library at New Delhi for reference. No postponement of the time, venue of the public hearing shall be undertaken, unless some untoward emergence situation occurs and only on the	

	recommendation of the concerned District Magistrate. This was not a part of the earlier Notification. The SPCBs or Union Territory Pollution Control Committee shall arrange to video film the entire proceedings. This was also absent in the earlier notification and may be considered as a good move to ensure that public hearing is proper. Unlike the earlier notification, no quorum is required for attendance for starting the proceedings. This may further be misused.	

According to the new notification, the terms of reference (ToR) of the project will now be decided by the SEAC at the state-level and by Environment Appraisal Committees (EAC) at the Central level. The will be decided on the basis of the information provided by the proponent. If needed the SEACs and EACs would visit the site, hold public consultation and meet experts to decide the ToR. The final ToR has to be posted in the website for public viewing. Though this seems good on paper, however, the proponent itself is providing the information for finalization of ToR and moreover there is no compulsory provision for public consultation. Further, if the EAC does not decide the ToR within the stipulated time, the project proponents can go ahead with their own ToR. This has some obvious inherent drawbacks and can be misused to a great extent. In other words, the new EIA Notification relies heavily on the Project proponents moral values and ethics as it leaves a lot of 'scope' for the project proponents to carry out the EIA as per their own terms and conditions.

Though there is clear mention of appraisal in the EIA process, there is no mention of post monitoring, a very important part of the entire EIA process. The area where there could have been major improvements in environment clearance process, i.e. public consultation, the new EIA notification is a major disappointment. The new Notification has made few changes that weaken the public consultation process. There is a provision in the new notification where a public consultation can totally be foregone if the authorities feel the situation is not conducive for holding public hearing. This can limit the involvement of people. Further, the consultation process has been divided into public hearing for local people and submission in writing from other interested parties. If this is the case, then Non-Governmental Organizations (NGO)/civil society organization will not be able to take part in the public hearing process, which will significantly affect the efficiency of the consultation process. The new notification thus also seems to be a classic example of environmental politics wherein some particular interests groups have been tried to keep at bay.

The focus of the New Notification has been to reduce the time required for the entire environment clearance process. The earlier process took around 14 - 19 months for Rapid EIA and 21 to 28 months for comprehensive EIA. As per the new notification, the Category A projects will be completed only in 10.5 to 12 months. There seems to be no justification for this other than the explanation that EC processes need to be rapid in order to ensure rapid development. This may result in compromising on the efficiency and transparency of the entire clearance process.

2.5 Stages in the Environmental Clearance Process

As per the EIA Notification, 2006, the following projects or activities shall require prior environmental clearance from the concerned regulatory authority.

- All new projects/activities listed in Schedule;
- Expansion and/or modernization of existing projects /activities; and
- Change in product mix.

2.5.1 Project Categorization

All projects and activities are broadly categorized into two categories - Category A and Category B, based on the spatial extent of potential impacts and potential impacts on human health and natural and man made resources.

- **Category A:** All projects or activities included as Category 'A' in the Schedule, including expansion and modernization of existing projects or activities and change in product mix. All Category 'A' projects require prior environmental clearance from the Central Government in the Ministry of Environment and Forests (MoEF) on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this notification.

- **Category B:** All projects or activities included as Category 'B' in the Schedule, including expansion and modernization of existing projects or activities as specified in the Notification as
    - Expansion and modernization of existing projects or activities listed in the Schedule to this notification with addition of capacity beyond the limits specified for the concerned sector, that is,

projects or activities which cross the threshold limits given in the Schedule, after expansion or modernization;

- Any change in product - mix in an existing manufacturing unit included in Schedule beyond the specified range.

However, those projects which fulfill the General Conditions (GC) stipulated in the Schedule are required to obtain prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA shall base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this notification. In the absence of a duly constituted SEIAA or SEAC, a Category 'B' project shall be treated as a Category 'A' project.

The **General Condition (GC)** is that any project or activity specified in Category 'B' will be treated as Category 'A', if located in whole or in part within 10 km from the boundary of:

I. Protected Areas notified under the Wild Life (Protection) Act, 1972,
II. Critically Polluted areas as notified by the Central Pollution Control Board (CPCB) from time to time,
III. Notified Eco-sensitive areas,
IV. Inter-State boundaries and International boundaries.

No screening is required for Category 'A' projects. Category 'B' projects are to be further screened at the state level for categorization into either B1 or B2. Specific guidelines have to be evolved by MoEF as per the Notification, to carry out such categorization. At present, the categorization is done only on the basis of the information provided by the applicant in the application form (Form 1 or Form 1A in case of construction projects).

This maybe a wonderful idea to facilitate the clearance of new projects but it has some obvious and inherent weaknesses. If and when such weaknesses will be exploited, it would mean legal destruction of local environs by the project proponents.

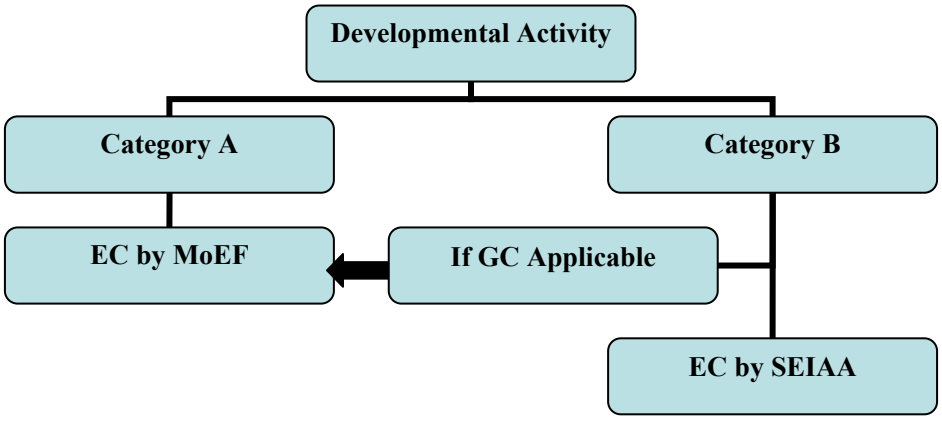


Figure 3 Project Categorization

2.5.2 A Critical Analysis of the Environmental Clearance (EC) Stages

Any individual/company seeking prior environmental clearance in all cases has to fill and submit the prescribed Form 1 and Supplementary Form 1A (if applicable) as given in Appendix II of the EIA Notification (2006). This has to be done after the identification of prospective site(s) for the project and/or activities to which the application relates, before commencing any construction activity, or preparation of land, at the site by the applicant. Along with the application, the applicant also has to furnish a copy of the pre-feasibility project report. In case of construction projects or activities (given in item 8 of the EIA Notification, 2006 Schedule) in addition to Form 1 and the Supplementary Form 1A, a copy of the conceptual plan has to be provided, instead of the pre-feasibility report.

If a project falls in Category ‘B’, the project goes to state government for clearance which further categories it as either B1 or B2 project. B2 projects do not require preparation of EIA reports. For obvious reasons, the EC process for new projects is different (and more detailed) than for existing projects.

The environmental clearance process for new projects comprise a maximum of four stages, all of which may not apply to particular cases. These four stages in sequential order are:

1. Screening
2. Scoping
3. Public Consultation
4. Appraisal

Stage 1: Screening

This stage is primarily to differentiate between projects belonging to Category ‘B’ which are to be cleared by the State Level Environmental Impact Assessment Authority (SEIAA). This stage entails the scrutiny of the application seeking prior environmental clearance made in Form 1 by the concerned State level Expert Appraisal Committee (SEAC) for determining whether or not the project or activity requires further environmental studies for preparation of an Environmental Impact Assessment (EIA) for its appraisal prior to the grant of environmental clearance depending up on the nature and location specificity of the project. Those projects requiring an Environmental Impact Assessment report are termed Category ‘B1’ and remaining projects are termed Category ‘B2’ and do not require an Environment Impact Assessment report. For categorization of projects into B1 or B2, the Ministry of Environment and Forests (MoEF) is supposed to issue appropriate guidelines from time to time.

The problem here is that lately 'fraudulent EIAs' has become a common term and that basing decisions just on the Application Form (for B2 projects) does not seem to be logical. Such decisions will be completely moved out of the EIA radar and hence will not even go through any public scrutiny. They should thus at least be strictly monitored for environmental impacts.

Stage 2: Scoping

Scoping refers to the process by which the Expert Appraisal Committee (EAC) in the case of Category 'A' projects or activities, and State level Expert Appraisal Committee (SEAC) in the case of Category 'B1' projects or activities determine detailed and comprehensive Terms of References (ToRs) addressing all the relevant environmental concerns for the preparation of the EIA report. It is that step which determines the various aspects that need to be studied in the EIA report. The EAC or SEAC concerned determines the ToR on the basis of the information furnished in the prescribed application Form1/Form 1A including ToR proposed by the applicant, a site visit by a sub-group of EAC or SEAC concerned only if considered necessary by the EAC or SEAC concerned, ToR suggested by the applicant, if furnished and other information that may be available with the EAC or SEAC concerned. However, construction/townships/commercial complexes/housing that fall under Item 8 Category 'B' of the schedule have been exempted from the need to do EIAs and are supposed to be cleared merely on the basis of information in Form 1/Form 1A and the conceptual plan.

It is unclear as to on what basis have the Item 8 Category 'B" projects exempted from Scoping. A well scoped EIA report for such a project can go a long way in understanding the environmental impacts of the project in its entirety. It can also offer creative ways of mitigating the impacts to the maximum extent possible rather than relying on the standard procedures that may be possible under the pollution norms which are mostly based on cut off/upper limits.

The ToR have to be conveyed to the applicant within sixty days of the receipt of Form 1. In case of Category 'A' Hydro-electric projects, clearance for pre-construction activities also has to be sent along with. If the ToR are not finalized and conveyed to the applicant within sixty days of the receipt of Form 1, the ToR suggested by the applicant shall be deemed as the final ToR approved for the EIA studies. The approved ToR have to be made public as well. Furthermore, applications for prior environmental clearance may be rejected by the regulatory authority concerned at this stage itself. In case of such rejection, the decision together with reasons for the same has to be communicated to the applicant in writing within sixty days of the receipt of the application.

Stage 3: Public Consultation

Public Consultation refers to the process by which the concerns of local affected persons and others who have plausible stake in the environmental impacts of the project or activity are ascertained. This stage of the EIA process is to consist of two aspects.

1. A public hearing process in which only local affected people can participate and
2. A process for obtaining written comments from others who are concerned citizens.

All Category 'A' and Category 'B1' projects or activities are to undergo Public Hearing. For reasons undisclosed, the following six projects from the said categories have been exempted from this very important stage of Public Hearing:

1. Modernization of irrigation projects
2. All projects or activities located within industrial estates or parks approved by the concerned authorities, and which are not disallowed in such approvals.

3. Expansion of Roads and Highways which do not involve any further acquisition of land.
4. All Building /Construction projects/Area Development projects and Townships.
5. All Category ‘B2’ projects and activities.
6. All projects or activities concerning national defence and security or involving other strategic considerations as determined by the Central Government.

While one can logically conclude the reasons for exempting some of the above projects from Public Hearing, it is not clear as to how and why projects like construction and township building, etc have been allowed to skip this extremely important step of the environment clearance process. Since this is a step to ascertain “the concerns of locally affected persons and others”, the exemption means that the concerns of locally affected persons and others will not be taken into account while clearing these projects.

The procedure for conducting the public hearing has been well crafted in the EIA Notification, 2006. The public hearing has to be completed within a period of 45 days from date of receipt of the request letter from the Applicant. If the State Pollution Control Board (SPCB) or the Union Territory Pollution Control Committee (UTPCC) fails to hold the public hearing within the stipulated 45 days, the Central Government in Ministry of Environment and Forests (MoEF) for Category ‘A’ project or activity and the State Government or Union Territory Administration for Category ‘B’ project or activity at the request of the SEIAA, will have to engage any other agency or authority to complete the process, as per the procedure laid down in the EIA Notification.

Also, one very important loophole that may be exploited is that if a company plans to setup a mega-project, it can first start with a very small component of this mega-project such that no EIA is required. It can later on apply for and expand the project after obtaining clearance. Thus, companies can get away with the EIA 'formality' in the initial stages of project launch.

While the Draft Notification maintained that, (even though) "there shall be no quorum required for attendance for starting the proceedings but at least half the number of the panelists and the District Magistrate of his representative should be present", the EIA Notification of 2006 has got rid of the second part of the sentence. Further, the public will has no control over whether or not their inputs and concerns get incorporated in the EIA report and influence the decision making process. Detailed documentation of the conduct of public hearings at the local level in various places by several civil societies indicates severe lacunae in the implementation of the public hearing process. At times, the Public Hearing is deliberately held far off from the Project site.

Following is an eye-witness account of a Public Hearing for the Nalwa Sponge Iron Limited (LSIL)'s expansion project in Chhatisgarh, by Kanchi Kohli[5], which speaks for itself.

> The NGOs present first sought the cancellation of the meeting, on the grounds that it was held too far away from the site of the proposed expansion. The Sub-Divisional Magistrate (SDM), J. Mohabe, flatly refused the demand for cancellation of the hearing. The SDM was on the panel as a representative of the District Collector (DC), S.K.Raju, who joined the hearing almost three hours after the official time specified in the public notice.
>
> When their first demand was refused, those present pointed out that the operations of NSIL have already in the past been riddled with complaints of legal, environmental and social violations as noted by the government itself. Given these, it would hardly be proper to allow further expansion. A public hearing, they argued, could only be held once the impacts were assessed properly, and given the non-compliance with many of the conditions for NSIL's operations, they asked that the plant itself be shut down until the required conditions were complied with. The SDM, however, did not grant their repeated demands that the hearing be postponed. When the DC arrived hours late, the demands were raised again. It took a further hour to convince him, but eventually, to the relief and appreciation of the majority present at the hearing, the DC finally ordered the cancellation of the hearing. It was announced that the next date of the public hearing would be intimated later.

[5] http://www.indiatogether.org/2006/mar/env-sponge.htm

Stage 4: Appraisal

Appraisal means the detailed scrutiny by the Expert Appraisal Committee or State Level Expert Appraisal Committee of the application and other documents submitted by the applicant for grant of environmental clearance. The projects which were exempted from EIA and public consultation are appraised only on the basis of information in the application form and discretionary site visits. However, there is no system of public participation at this stage. As a result, citizens do not get to see the final documents on the basis of which the Appraisal committees will recommend clearance to the project.

Moreover, while a stipulated time period has been assigned to the various stages over and above which the project gets nearer to getting a clearance, there is no set minimum time which must be spent on putting together a comprehensive EIA report. This has severely compromised the quality of EIA Reports and they are even being called Rapid or Single Season EIA Reports. The new notification should have specified the time needed between the grant of TOR and the completion of at least a four season EIA report.

2.5.3 Validity of EC

The “Validity of Environmental Clearance” implies to the period from which a prior environmental clearance is granted by the regulatory authority, or may be presumed by the applicant to have been granted as per the Notification (2006), to the start of production operations by the project or activity, or completion of all construction operations in case of construction projects (item 8 of the Schedule), to which the application for prior environmental clearance refers.

Even the Validity time period has been stipulated (and goes in years) after an EIA report, which has now being made even on one – season data.

Following is the validity time period for various projects:

- Maximum 30 years for mining projects
- 10 years for River valley projects
- 5 years for all other projects
- Limited period for Area development projects till the developer is responsible

The Validity can be extended to another 5 years by submitting an application in Form - 1 while within the validity period.

2.5.4 Post EC Monitoring

The EIA Notification makes it mandatory for the project management to submit half-yearly compliance reports in respect of the stipulated prior environmental clearance terms and conditions. This has to be done in both hard and soft copies and has top be submitted to the regulatory authority concerned, on the 1^{st} of June and 1^{st} of December of each calendar year. All such compliance reports submitted by the project management shall be public documents. Copies of the same shall be given to any person on application to the concerned regulatory authority. The latest such compliance report shall also be displayed on the web site of the concerned regulatory authority

2.6 Future of EIA in India

India has one of the best legal provisions and also cultural and ethical environmental conservation values both of which will play a major role in further strengthening the EIA process in India. While other countries may wait for the Environmental Kuznets Curve[6] concept to work and take care of their environs, once they become affluent – India chose not to follow the same and has now gone to the extent of defying the Kuznets curve.

All of India's developmental policies are adopting the sustainable development concept. It is now being realized that development is no doubt important but not at such a cost that it begins to harm more than it benefits. The new Environmental Impact Assessment (EIA) Notification (2006), and the amendments to follow are positive steps that have been taken to launch only sustainable and carefully planned projects in the country. The new Notification has certain drawbacks which are and will be addressed by bringing necessary amendments from time to time. India is on a development spree which is required to complement as well as supplement the economic growth of the country.

Thus, development projects will keep coming up from time to time and EIA serves as an almost perfect tool assess those projects, mitigate the environmental impacts address all other environmental concerns. However, there is a need to shift from projects to policies in order to address the environmental issues very early in the whole development process.

[6] The environmental Kuznets curve is a hypothesized relationship between various indicators of environmental degradation and income per capita. In the early stages of economic growth degradation and pollution increase, but beyond some level of income per capita the trend reverses, so that at high-income levels economic growth leads to environmental improvement.

3. Improving Impact Assessment in India

With lessons learnt during preliminary data collection for carrying out EIA of two proposed Hydroelectric Power Projects on River Mandakini (District Rudraprayag, Uttrakhand) for LANCO Group

Photo: Water sampling at the Barrage Site for the proposed Phata-Byung Hydroelectric Project

Conservation, protection and preservation of the environment have been the cornerstone of the Indian ethos, culture and traditions. There values are enshrined in our Constitution as well, which is one of the first in the world to recognize the importance of environmental conservation. The Indian Constitution enjoins the “State to take measures to protect and improve the environment and to safeguard the forests and wildlife of the country.” It also makes it a “fundamental duty of every citizen to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have ecological compassion for the living creatures” (Introduction to EIA Notification, 1994).

With this at the backdrop and the concept of sustainable development (social and economic betterment that satisfies current needs without foreclosing options for the future or compromising the ability of future generations to meet their own needs) in the foreground, the Environmental Impact Assessment (EIA) was first notified in 1994 as the primary method for obtaining Environmental Clearance (EC). While there are other methods of carrying out Impact Assessment, EIA has been the most popular among them world over. However, different countries have different environmental and social setup and the EIA process needs to be modified accordingly.

India’s cultural diversity has almost the similar diversity index as that of its biodiversity. The fact that the poorest of Indians live in areas that are rich in terms of natural resources, biodiversity and/or mineral wealth emphasize the importance of a proper EIA, in the event that new projects are proposed at any of these rich parts of the country. This is because the direct impact of such projects will evidently befall on these poor people and any development at this cost will eventually be unsustainable. The following pages include some salient features that should be inherent to not just Environmental Impact Assessment (EIA) but any Impact Assessment protocol in India.

3.1 Interdisciplinary Team Formation

An “interdisciplinary team” can be defined as a group of two or more persons trained in different fields of knowledge with different concepts, methods and data and terms which has been organized to address a common problem with continuous communication among participants from different disciplines (Dorney and Dorney, 1989). Simply put an interdisciplinary team consists of a group of people, trained in different fields, who interact to produce a coordinated EIA report. The Center for Interdisciplinary Studies on Mountain and Hill Environment (CISMHE, Delhi University) is one of the few Impact Assessment centers in the country which have a proper inter-disciplinary team that works in completely inter-disciplinary environment.

This approach can be contrasted with a team made up of experts, who pursue their lines of inquiry relatively separately and do not have a common understanding of the impact of the proposal. This is the “multidisciplinary approach” in which persons versed in different disciplines work together without specific, pre-established inter-relationships. When this is the case, the EIA Project Manager has the primary task of drawing together the findings. Often, the lack of an interdisciplinary approach results in an EIA report that does not have any real synthesis and contains a number of specialist studies with little cross-referencing. Thus, it is important that interdisciplinary and not multidisciplinary activities dominate the process of Impact Assessment.

“Inter-disciplinary activities” are characterized by inter-relationships and the sharing and integration of the findings of the team members (Van Dusseldorp and Van Staveren, 1983). An interdisciplinary team for a specific impact study can be considered as a temporary entity which has been assembled, and specifically appointed, for meeting the identified purpose of conducting an EIA for a proposed project.

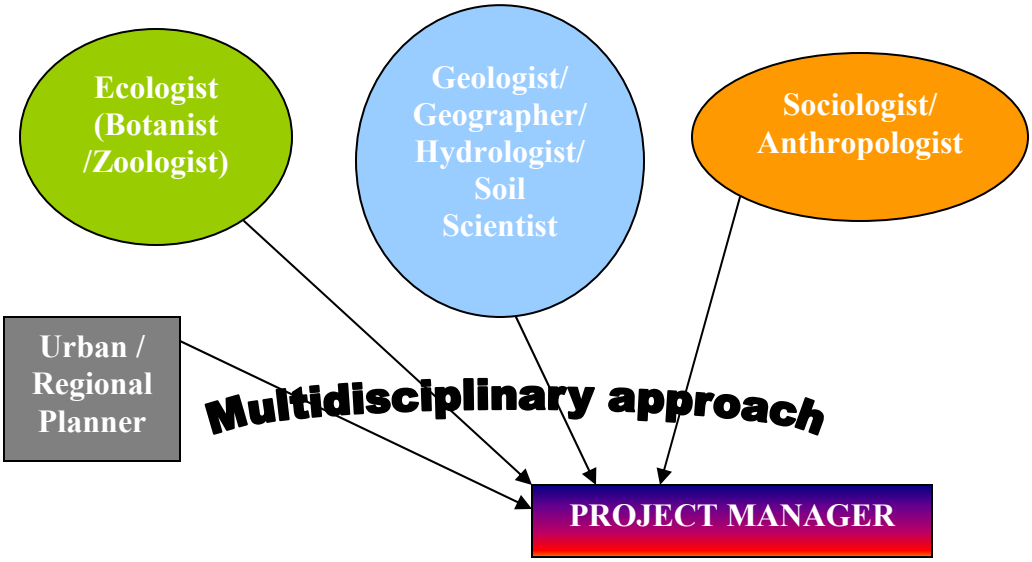


Figure 4 Multidisciplinary approach to EIA

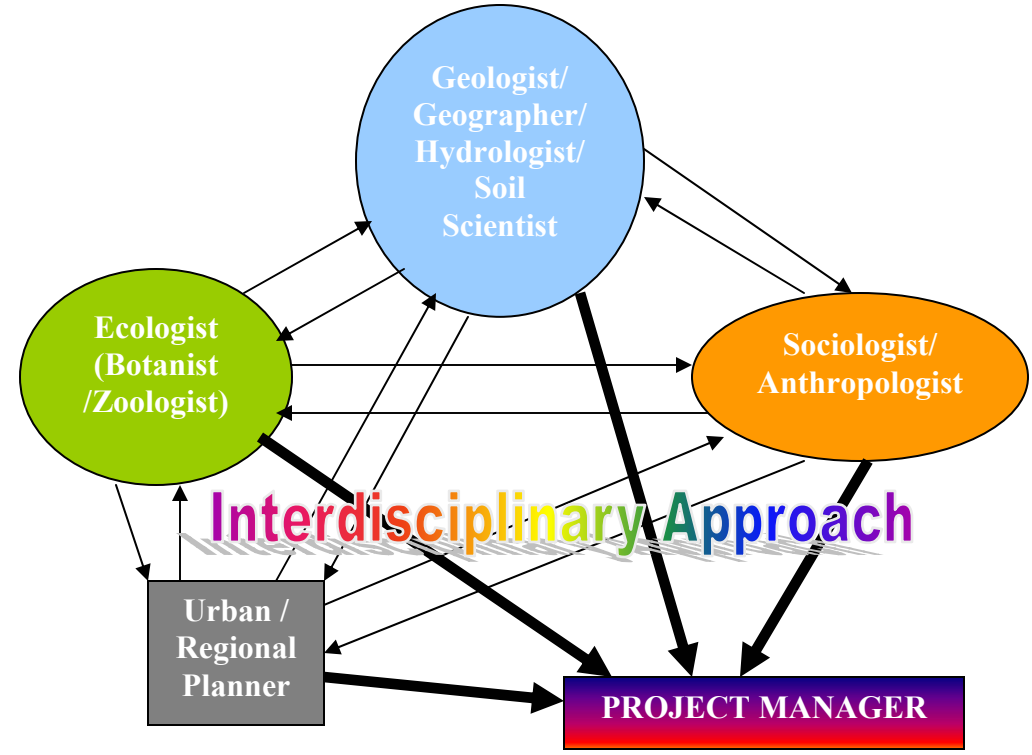


Figure 5 Interdisciplinary approach to EIA

Most proposals have a number of potential impacts, notably including physical, chemical, biological, social, cultural and economic impacts. The EIA team will need to bring together multiple viewpoints and expertise in order to produce a reasoned statement of the overall impact. The selection of appropriate team members is a key task of the EIA Project Manager. The team maybe assembled with formal authority, responsibility and accountability; however, a more typical approach is the delineation of an informal authority within the team, that is, the team is basically subject to management by the team leader (Cleland and Kerzner, 1986).

A member of a successful interdisciplinary EIA team is supposed to have:

- Interpersonal skills
- Creativity
- Adaptability
- Good oral and written communication skills
- Organizational capability
- The ability to listen and to assimilate information
- A sense of humour and
- Patience

The number of members of an interdisciplinary team can vary from as few as two to as many as 8 or 10 individuals, depending upon the size and complexity of the study. A core team for an impact study could consist of the following (World Bank, 1991)

1. A project manager or team leader – often a planner, social or natural scientist, or environmental engineer – who has experience in preparing several similar studies, management skills, and sufficiently broad training and/or experience to be able to provide overall guidance and to integrate the findings of individual disciplines.

2. An ecologist or a biologist (with aquatic, marine, or terrestrial specialization, as appropriate).
3. A sociologist-anthropologist who has experience with communities similar to that of the project.
4. A geographer or geologist-hydrologist-soil scientist.
5. An urban or a regional planner.

This core team could further be supported by specialists of different fields.

Team Leader/Project Manager

Establishing a team does not in itself guarantee that the EIA will be interdisciplinary. It is the role of the EIA Project Manager to structure opportunities for the team to work together. Often, an initial site visit is an important means of bringing together team members to learn about the scope of the EIA study. Other meetings can be used to review the direction, progress and results of the work and to develop an integrated approach to writing the EIA report.

The EIA Project Manager will be responsible for keeping open the lines of communication with the stakeholders, and for addressing conflicts and differences. Conflict within the team can be either because of disagreement about scientific interpretation, or because members do not get on with each other. The proponent can disagree with the EIA team about the significance of key impacts, or, worse still; want to alter the EIA report. Other stakeholders may attempt to push their own interests by disagreeing with the basis of study findings, reflecting different objectives or values from those of the EIA team and/or proponent. Some of these conflicts can be avoided or contained by effective communication and the provision of timely information. Thus, a critical individual in the successful delineation and operation of an interdisciplinary team is the team leader.

Other conflicts within the EIA team and with the proponent go on to test the negotiation skills of the Project Manager, and call for a combination of diplomacy, mediation and dispute settlement. Even so, it is not always possible to satisfy all of the parties all of the time.

The team leader should exhibit a number of specific, pertinent, personal and professional qualities such as (Cleland and Kerzner, 1986).

1. Demonstrate knowledge and leadership skills in a specialized professional field.
2. A positive attitude in support of the conduction of the EIA study
3. A rapport with individuals
4. An ability to communicate with both technical and non-technical persons
5. Pride in his or her technical specialty area
6. Self-confidence
7. Initiative, self-starter ability
8. A reputation as a person who gets things done
9. The ability to deal successfully with the challenge of doing quality work
10. The willingness to assume responsibility for the overall study and team leadership

3.2 Traditional Ecological Knowledge and EIA

Traditional Knowledge can be defined as a cumulative body of knowledge and beliefs handed down through generations by cultural transmission, about the relationship of living things (including humans) with one another and with their environment. The Director General of United Nations Educational, Scientific and Cultural Organization (Mayor, 1994) defines traditional knowledge as:

> *The indigenous people of the world possess an immense knowledge of their environments, based on centuries of living close to nature. Living in and from the richness and variety of complex ecosystems, they have an understanding of the properties of plants and animals, the functioning of ecosystems and the techniques for using and managing them that is particular and often detailed. In rural communities in developing countries, locally occurring species are relied on for many - sometimes all - foods, medicines, fuel, building materials and other products. Equally, people's knowledge and perceptions of the environment, and their relationships with it, are often important elements of cultural identity.*

Most indigenous people have traditional songs, stories, legends, dreams, methods and practices as means of transmitting specific human elements of traditional knowledge. Sometimes it is preserved in artifacts handed from father to son or mother to daughter. In virtually all of these systems, knowledge is transmitted directly from individual to individual.

As already stated, India's cultural diversity is as vast and diverse as its biological diversity. And that some of the poorest people (and tribals) inhabit areas which are rich in natural resources of various kinds. Thus, not only should the developmental activities (in such areas) be carried out after carrying out a proper EIA but these native (=local) people can actually be used in collecting baseline as well as rigorous data from that particular area. Consequently, Indigenous people's traditional ecological knowledge and management systems (TEKMS) are the subject of much interest in the developing as well as developed world.

When it comes to having knowledge about the climate, weather pattern, hazard prone, type of vegetation and plant composition, etc. for an area, it is but obvious that those people who actually belong to that area will have more information about such factors. Other than this, it has been noted that a successful Social Impact Assessment (SIA) can only be carried out if the people affected by the project are aware of the details During the Preliminary Data collection for the Hydroelectric Projects' EIA, we realized that the people of the area around the project site were more than willing to give their land in the name of development.

Some of them had already given their land on lease and others were only happy that the project will generate more employment for the neighbouring villages. However, it was a small girl (age 15) who stated that when labourers from outside will come for the project work, there are several restrictions put on her and her friends' movements and activities. This maybe a trivial information but can actually go a long way in determining the change in Quality of Life during and after the project has been installed.

3.2.1 Traditional Knowledge and Biological Information

One component of Environmental Impact Assessment (EIA) where properly collected and well organized traditional knowledge can play instrumental role is Ecological Impact Assessment (EcIA) and/or Biodiversity Assessment. This is because no matter how many trips are made to the affected site, a proper inventory of all the birds and animals; and also of annual plants can never be made. Besides, local people may use some of the herbs, shrubs, etc. for making traditional medicines and these facts may not be noticed if such information is not available with the impact assessor.

Having detailed information and year round data of birds that inhabit or visit the affected area is also pivotal for a good Impact Assessment Report. During our trip to the project area, we took help of a certain Mr. Yahspal Singh Negi (on right), who runs a small bird-watching camp in Kakdagad, Rudraprayag. The information and the bird checklist provided by him and the locals of the area which was of much use for us.

Photo: Collection of snake skins by Mr. Negi

Photo: Discarded bird nests collected by Mr. Negi

While traditional knowledge maybe a term used for information passed on through ages, collecting information from the locals about animals who frequent that particular area is also an important component that makes TEKMS important for an effective EIA. During our visit, we were informed of monkeys and *langurs* entering and destroying the fruit orchards some of which were located on project site. Thus, even though they are fruit trees, the impact of their being removed will not be considerable to the people who own the orchards. We were also informed of a leopard attach in the neighbourhood (near Guptkashi) just a day after our arrival. The native people had also sighted bears, gorals, and several large mammals which we would have otherwise missed to mention in our report.

The knowledge of local people can also go a long way in minimizing habitat fragmentation, particularly of some rare species in the region. This is because animals usually have a set path to move from one place to another. If some construction activity (road, houses) is carried out near such an area, it may have fatal consequences for the said animal.

3.2.2. Collecting and Organizing Traditional Knowledge

In order to systematically obtain and organize information to ensure that it is useful for EIA and that it can be properly integrated with information from other sources, two broad approaches have been followed:

1. Some investigators have gathered information on TEKMS indiscriminately in an attempt to record everything available for a culture, irrespective of its immediate practical value.

2. Others have recorded this information on an *ad hoc* basis in the course of studying other aspects of indigenous cultures.

While both these approaches are valuable, but neither are appropriate for environmental impact assessment. Consequently research on TEKMS should focus on four essential perspectives or frames of reference in order to make it more valuable took for Impact Assessment.

i. Taxonomic
ii. Spatial
iii. Temporal
iv. Social

Taxonomic frame of reference: More has been written about indigenous plant and animal naming systems than any other aspect of traditional ecological knowledge. Many indigenous people only know the local language names for most local plants and animals. Thus, to study traditional knowledge about these species, one must first become similar with these names. The local significance of each indigenous plant and animal as well as soil/rock taxon should be determined lest the importance of some of these as sources of food, medicine, structural material, tool, sacred entities maybe overlooked.

Spatial Frame of reference: Fundamental to EIA is recording the spatial distribution of living and non-living resources and amenities by mapping. Knowledge possessed by locals can be invaluable in this context, especially in regions where recorded knowledge of local environments is poor.

Temporal frame of reference: Indigenous resource users usually know the exact location and timing of a host of significant biological events. Areas that appear as unremarkable to an EIA researcher during a site inventory in one period may serve as aggregation sites or mitigating routes for important animals in another time period. A relatively barren beach in September for instance, maybe thronged with nesting turtles in May.

Habitats that hold few birds during day may fill with roosting birds at night after the resource inventory-takers have gone home.

Social frame of reference: This includes the way in which indigenous people perceive, use, allocate, transfer and manage their natural resources. This perspective is hardest to bring into sharp focus, but it is no less important than the preceding three frames of references. Traditional ecological knowledge cannot be used properly in isolation form the social and political structure in which it is embedded.

3.2.3 Role of women and children in TEKMS

Traditional knowledge that is held by women needs special consideration for a number of reasons. Native women, as the primary harvesters of medicinal plants, seed stocks and small game, are keepers of the knowledge about significant spheres of biodiversity in their own right, and as such, often they are the only ones able to identify the environmental indicators of ecological health in those spheres. Perhaps even more central in importance is the fact that women share with men the responsibility for stewardship of values in their societies. They feel a keen responsibility to future generations for action undertaken today that affect the world in which we all live and for their descendants.

It is women, for the most part, who transmit to the next generation these values as part of their stewardship role. Their multi-generational perspective must be taken into account while structuring any research on traditional knowledge or while making an effective TEKMS.

3.3. Environmental Management Programme (EMP)

An Environment Management Programme (EMP) along with the risk mitigation measures are the results of an environmental impact assessment (EIA) report. A properly carried out EIA will thus mean a clear, relevant and effective EMP. Significant adverse impacts which need to be addressed by the EMP and require mitigation are for:

- Provision for compensatory afforestation
- Reclamation of Land
- Measures to control air, water and noise pollution
- Human Rehabilitation

Compensatory afforestation: As per the norms of the MoEF, when forest lands are used for non-forestry purposes, adequate compensatory afforestation is required. Compensatory afforestation is to be raised over an area equivalent to the diverted area. When non-forest lands are not available, it should be raised over degraded forests twice in extent to the area being diverted. Compensatory afforestation is also mandatory in road widening projects in the city area, where it is supposed to be carried out on the fringes of the city. The Delhi Metro also has been carrying out compensatory afforestation lately, for all the trees that it needed to cut in order to lay down its underground and above-ground rail network.

However, the issue that is not addressed here is that ‘forests’ do not only mean trees. A forest, with all its biodiversity (which interacts to provide useful ecosystem services) is much more than just the ‘trees’. But when forests are cleared and compensatory afforestation carried out elsewhere, the impact on the biodiversity depending on these trees is clearly overlooked.

Land Reclamation: Quarry area is proposed to be stabilized by stage-wise vegetation plantation.

Mitigation for air pollution control: Measures are taken towards arresting the generation of dust and its spread. These include water spraying on surface at blasting site, development of green belts, stabilization of overburden dumps, etc. Noise pollution is such that it cannot really be eliminated from most projects. The preventive measures include the use of silencers/mufflers and plantation of green belts. It should also be ensured that residential colonies and also the temporary colonies constructed during the project are located away from the noise sources.

Rehabilitation of displaced persons: The required provisions include land compensation, shifting allowance, development of alternative land, etc. However, there is some or the other problem faced almost always in such rehabilitation procedures. As it is, the displacing of people from their native land is an issue of serious concern. People who have lived in an area for several decades are asked to move out within a few days. And when this rehabilitation is not done properly, the anger and resistance of the locals cannot be unexpected. Thus, we need to develop a highly effective policy which takes care of all rehabilitation issues.

Also, it must be remembered that the EIA report is actually prepared to obtain an Environmental Clearance (EC) and is still seen as a hurdle (to be cleared anyhow) by most of the companies who want to initiate a new project. The reason behind this is that unlike in the US, where the need for the EIA had been an internally driven process, in India it was forced by outside agencies. It has therefore become more of an administrative exercise here. Owing to this, once obtained, the EIA report is largely ignored and rarely, if ever, opened by the project companies.

Now, since the EMP report is also a part of the EIA report, even the EMP faces the same fate as the EIA report. It is therefore advisable that the EIA agency make two separate reports – one for EIA and one for EMP. Apart from this, an EMP is useless if it is not monitored from time to time, the provision for which, has been provided in the EIA Notification of 2006.

3.4 Environmental Information Center (EIC)

(http://www.eicinformation.org)

A common allegation that civil societies and NGOs have always been made against some lot of EIA agencies is that the EIA agencies often do not even make adequate site visits and that the EIA Report is actually prepared by them while sitting in their air-conditioned office in Delhi (or the respective city). With the initiating of the setting up of an online (and offline) Environmental Information Center (EIC) by the Ministry of Environment and Forests (MoEF), this allegation may soon become a norm and a method of carrying out effective EIAs. Without doubt, the importance of proper study visits to the project site cannot be undermined but the EIC will eliminate the need to make preliminary investigations.

The EIC was set up by the MoEF to function as a professionally managed clearing-house for environmental information. The Centre began to function as a pilot project in the year 2002. This project is supported by a World Bank loan under the Environment Management and Capacity Building (EMCB) project. The primary objective of EIC is to act as a one-stop source for quality environmental data on India. Various stakeholders including the MoEF, Regulators, Project Proponents, Consultants, Non-profit/ Community based organizations and Financial Institutions, are using the diverse applicability of the EIC data as a planning and decision-making tool.

Mission of EIC

To provide high quality environmental data and information on India in a timely and cost-effective manner, to improve Environmental Studies, project screening & scoping, and the decision-making process.

The objectives of the EIC as listed on its website are:

- Collect and Store Environmental Information on India
- Improve accessibility to environmental data in India
- Improve Quality of Indian environmental data
- Meet the data needs of environmental stakeholders

With the help of the EIC, it has now become possible to obtain information to meet specific project requirements. The final data products can be structured as required by the data user. EIC data is used for project planning, site selection, feasibility studies, screening and scoping, post project monitoring, preparation of EIA reports and others. MoEF also uses EIC services to provide feedback on the authenticity of secondary environmental data reported in the EIAs. EIC data is used for project planning, site selection, feasibility studies, screening and scoping, post project monitoring, preparation of EIA reports and others. MoEF also uses EIC services to provide feedback on the authenticity of secondary environmental data reported in the EIAs.

The data can easily be obtained in four easy steps.

STEP 1:	IDENTIFY THE ENVIRONMENTAL DATA REQUIREMENTS
STEP 2:	SEND EIC the ENVIRONMENTAL DATA REQUIREMENT
STEP 3:	RECEIVE A QUOTATION FOR THE ENVIRONMENTAL DATA REQUIREMENT (The cost quotation for the data is state to be sent within 3 Working Days from the date of receipt of the Data Request Form)
STEP 4:	PLACE THE ORDER

The features of the EIC data include:

- Intensive and Interactive GIS database on India
- Layers of information on spatial environmental data
- Processed using sophisticated GIS software like ARC GIS, ERDAS, IMAGINE, MAPINFO, AUTOCAD and others
- Attached with metadata to indicate the data quality
- Structured to respond to environmental clearance questionnaires and to assist in spatial environmental planning
- Checked using the Data Storage, Validation and Retrieval System (DSVRS), involving a number of procedures and statistical checks

The setting up of the EIC was advocated by the same Govindarajan Committee on whose recommendations the EIA Notification of 1994 was revised. To ensure a speedy environment clearance as per the environment regulations in India, Govindarajan Committee had recommended to the MoEF to consider setting up a central data centre, which would serve as a one-stop source for obtaining reliable and validated environmental data for preparing Environmental Impact Assessments (EIAs). The database was slated to help project screening and scoping for the EIA study. While this maybe an excellent tool in the hands of Impact Assessors, it is important that ground realities be checked before taking irreversible decisions. Besides EIC data should only be taken into account if it is updated to the day of the report being prepared.

The EIC also does not provide enough data to carry out a Social Impact Assessment (SIA) which the EIA agency should always carry out by itself. However, EIC can be a very useful tool for screening stage of the EC process, where the concerned authority can check the data provided by the project proponent with that from the EIC.

3.5. SEA (Strategic Environmental Assessment)

Its importance in India and other developing countries

As maintained previously, India is on the expressway to development. Like other developing countries, India is also investing a lot of capital in the name of development and setting up projects, as and when possible. Given the above facts and the complex nature of environmental conflicts and stakeholders, it is now being felt that EIA may not be the only tool that should be used. The logic for this is that just because it is used in the US and propagated by World Bank etc. doesn't make it the right conflict resolution tool for all developing countries.

The current trend of industrialization and urbanization in the developing nations has a huge impact on anthropogenic and natural ecosystems. Pollution sources increase with the expansion of cities and construction of new projects causing even greater contamination of water, air and soil. The absence of proper environmental planning and management strategies has raised serious doubts about the sustainability of the present race to development.

Despite the existence of good EIA guidelines and legislation, environmental degradation continues to be a major concern in developing countries. In many cases, EIA has not been effective due to legislation, organizational capacity, training, environmental information, participation, diffusion of experience, donor policy and political will. This can be attributed to the fact that even though developing countries are accepting more responsibility for the environmental impacts that result from their development activities, many have been following the EIA legislation of developed countries as a management tool for these impacts since the last two decades.

The need for SEA has arisen from the project-specific nature of EIA and awareness that environmental issues must be addressed early in the process of policy and plan making. The rationale for SEA can therefore be summarized as:

- To ensure that environmental issues are addressed in a pro-active way in policies and plans
- To improve the assessment of cumulative environmental impacts from secondary and downstream development associated with large projects
- To focus on sustainable development

3.5.1 SEA – Definition

The term (SEA) is variously defined and understood. However, many definitions have common or overlapping aspects. Put simply, SEA refers to a formal, systematic process to analyze and address the environmental effects of policies, plans and programmes and other strategic initiatives. This process applies primarily to development-related initiatives that are known or likely to have significant environmental effects, notably those initiated individually in sectors, such as transport and energy, or collectively through spatial or land use change. This process extends the aims and principles of EIA upstream in the decision-making process, beyond the project level and when major alternatives are still open. SEA represents a proactive approach to integrating environmental considerations into the higher levels of decision-making. As with EIA, SEA can and should be interpreted broadly, for example to include social, health and other consequences of a proposed action and their relationship to sustainable development concepts and strategies.

The terms “policy”, “plan” and “programme” also mean different things in different countries. In general, all countries having experience with SEA distinguish between policies, plans, programmes and projects:

- Policy – “A general course of action or proposed overall direction that a government is, or will be, pursuing and which guides ongoing decision-making.”[7]
- Plan – “A purposeful, forward looking strategy or design, often with coordinated priorities, options and measures, that elaborates and implements policy.”
- Program – “A coherent, organized agenda or schedule of commitments, proposals instruments and/or activities that elaborates and implements policy.”

A hierarchy exists between policies, plans and programs with policies are at the top level of conceptualization and generality; plans are one level down from policies, and programs. Programs make plans more specific by including a time schedule for specific activities. Implementation of a program involves carrying out specific projects, which can be subjected to the usual EIA.

3.5.2 SEA Vs. EIA – The need for SEA

Despite its wide use and acceptance, EIA has certain shortcomings as a tool for minimizing environmental effects of development proposals. It takes place relatively late at the downstream end of the decision making process, after major alternatives and directions have been chosen. In the early 1990s, researchers had started studying the limitations of project-level EIA. Their findings called for the introduction of something other than project-level EIA to encompass environmental considerations.

[7] Sadler, B. and R. Verheem, 1996, *Strategic Environmental Assessment: Status, Challenges and Future Directions*, Ministry of Housing, Spatial Planning and the Environment, The Netherlands.

In the first half of the 1990s, researchers emphasized the limitations of project-level EIA. The limitations stated by Glasson et al. (1994) and Lee and Walsh (1992) can be summarized as follows:

1. Project EIAs react to development proposals rather than anticipate them, so they cannot steer development towards environmentally “robust” areas or away from environmentally sensitive sites.
2. Project EIAs do not adequately consider the cumulative impacts caused by several projects or even by one project’s subcomponents or ancillary developments.
3. Some small individual activities are harmless, but the impact of those activities can be significant, which cannot addressed by project EIAs.
4. Before preparation of the EIA, a project can be planned quite specifically, with irreversible decisions taken.
5. Project EIAs cannot address the impacts of potentially damaging actions that are not regulated through the approval of specific projects.
6. Project EIAs often have to be carried out in a very short period of time because of financial constraints and the timing of planning applications.
7. Assessing impacts from ancillary developments, difficulties can arise in evaluating the environmental impacts, which may result from indirect and induced activities stemming from a major development.
8. Foreclosure of alternatives, typically, by the project assessment stage, a number of options, which have potentially different environmental consequences from the chosen one, have been eliminated by decisions taken at earlier stages in the planning process, at which no satisfactory environmental assessment may have taken place.

Thus, the new trend is to address environmental issues earlier in planning and policy making processes by the use of Strategic Environmental Assessment, or SEA.

Table 6 EIA and SEA – A Comparison[8]

Environment Impact Assessment	Strategic Environment Assessment
➢ Takes place at end of decision-making cycle ➢ Reactive approach to development proposal ➢ Identifies specific impacts on the environment ➢ Considers limited number of feasible alternatives ➢ Limited review of cumulative effects ➢ Emphasis on mitigating and minimizing impacts ➢ Narrow perspective, high level of detail ➢ Well-defined process, clear beginning and end ➢ Focuses on standard agenda, treats symptoms of environmental deterioration	➢ Takes place at earlier stages of decision making cycle ➢ Pro-active approach to development proposals ➢ Also identifies environmental implications, issues of SD ➢ Considers broad range of potential alternatives ➢ Early warning of cumulative effects ➢ Emphasis on meeting environmental objectives, maintaining natural systems ➢ Broad perspective, lower level of detail to provide a vision and overall framework ➢ Multi-stage process, overlapping components, policy level is continuing, iterative ➢ Focuses on sustainability agenda, gets at sources of environmental deterioration

[8] Source: EIA Training Resource Manual, 2nd edition, 2002, United Nations Development Programme

3.5.3 Advantages of SEA

Project – level EIA is carried out after questions relating to whether, where and what type of development should take place have either been decided or largely pre-empted based on prior analyses that did not account for environmental concerns. For a developing economy like ours, one wrong decision can take us several steps 'back'. Thus, with the help of SEA, environmental considerations can be introduced early in decision making process, before project location and scale decisions have been made. Also, SEA allows decision makers to focus on the environmental effects of strategic choices, before specific projects are considered. Thus, compared to a project-level EIA, an SEA can consider a broader range of alternative proposals and mitigation measures. SEA allows for the systematic consideration of cumulative and broad scale (i.e., regional and global) environmental effects. There is often a lack of correspondence between the temporal and spatial scale of cumulative effects and the narrow scope of project-level EIA.

SEA provides a mechanism for incorporating into decision-making considerations related to sustainable development; i.e., development that meets the needs of the present without compromising the ability of future generations to meet their own needs. SEA can draw attention to potential environmental problems early so that decision makers can filter out environmentally damaging projects that might otherwise be the source of costly and protracted delays and controversy. From an applied perspective, recent-practice SEA is often related to sustainability goals, such that SEA can assist in the selection of more sustainable policies and strategies (Noble and Storey, 2001). The holistic problem-solving and integration characteristics enable SEA to contribute to more sustainable decision making. SEA should therefore be incorporated at the policy level especially by the developing nations such that it both complements and supplements the existing Impact Assessment procedure.

4. Concluding Remarks

4.1 Conclusion

Development is the need of the hour particularly in the developing countries wherein more than two-third of mankind lives. While development is essential to improve the quality of life, meet basic human needs and secure better prospects for the citizens of developing countries, it is also equally essential to ensure that development takes place on a sustainable basis. There are several instances from all over the world where poorly conceived plans manifested in various environmental problems and severely affected human health and well-being.

Even though development is important, it is neither scientific not rational to accept the argument that developing countries of today, as was done by the developed countries, should develop and progress first and having developed, work to rectify the environmental disruptions that may have been caused during the development process. This argument is not only unacceptable from an ethical view-point but is also economically incorrect. During the industrialization of the presently developed countries, resources, energy and labour were plentiful and cheap. The era of cheap energy has now been over for more than a decade and labour is no longer cheap either. Besides, these conditions are unlikely to be repeated in the future and that awareness towards adverse environmental implications of ‘development’ has risen.

It is thus very important to ensure that development takes place at the least environmental cost. One way to ensure this is to carry out Environmental Impact Assessment (EIA) of development plans and ensure that the results are incorporated firmly into the planning process.

Ever since its inception, more than three decades ago, EIA has gained popularity and spread world over. Presently, it is the only environmental tool which legally ensures that any new project is launched / installed / setup in such a way that it causes least damage to the environment. EIA has been successfully used in many developed countries during the past three decades. The past two decades has also seen it being used in developing countries but even then there are several misconceptions that need to be addressed before EIA can be a success in the developing countries. Besides, what is necessary is to find innovative ways of carrying out EIA under limited costs, time and available expertise.

The EIA framework was formally setup and notified in India in back in 1994. However, the concept of EIA was prevalent even before that. While the notification was constantly amended from time to time, a need was felt to revise it completely. Thus, a new EIA Notification came up in 2006. The new notification is understood to be pro-projects and even the MoEF has been projecting it as a time bound process which will facilitate the setting up of development projects all over the country. The new notification also leaves ‘scope’ for it to be exploited and bypassed with relative ease. Also, there is a need to shift from project based impact assessment to a policy based impact assessment, especially for India and other developing countries who cannot afford to make serious mistakes with the long-term sustainability of their development plans.

At the same time, EIA needs to be standardized for respective countries and the effectiveness of such standardized EIAs can be proven to be greater than a common EIA framework followed through out the world. Components such as ‘incorporating traditional knowledge for data collection’, forming a proper interdisciplinary team, etc. may seem small issue but go a long way in determining the ‘impact’ of the Environmental Impact Assessment report in minimizing and mitigating environmental damages.

4.2 Limitations of the study

A detailed paragraph-by-paragraph analysis of the Environmental Impact Assessment Notification, 2006 has not been possible owing to time constraint. The field visit to the project site was for a very short duration of time and only for preliminary data collection. Any good EIA study should be based on a four season site visit followed by monitoring. Therefore, only those issues could be highlighted in the study, that are related to the preliminary processes of Environmental Impact Assessment. No analysis of the effectiveness of post-project monitoring and adoption of mitigation measures has been made in this dissertation.

4.3 Potential Areas for further research

Though an attempt has been made to address the limitations of the Environmental Clearance (EC) process, further research needs to be carried out to investigate drawbacks and the need to incorporate Strategic Environmental Assessment (SEA) as a tool for sustainable development, especially in the developing countries. The preparation and incorporation of Traditional Environmental Knowledge Management Systems (TEKMS) into EIA and the science and art of collecting such traditional knowledge also needs to be researched.

EIA Humour

King (standing next to a serene meadow): I am going to build a great mall right here.

Aide: But what about the Environmental Impact, Sire!!?

King: Oh, we will build it to withstand anything!!

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