

The Inception and Evolution of EIA and Environmental Clearance Process – Laying Emphasis on Sustainable Development and Construction

Devarshi Tathagat*, Dr. Ramesh D. Dod**

*P.G. Student – M.E. (Construction Management), MAEER'S Maharashtra Institute of Technology, Pune-38

**Prof. & Head, Dept. Of Civil Engineering, MAEER'S Maharashtra Institute of Technology - College of Engineering, Pune-38

Abstract

EIA which stands for environmental impact assessment is a domain which encompasses almost all areas of environmental engineering. EIA and environmental clearance (EC) are two things which MoEF, Govt. Of India has mandated for many categories of project before their commissioning. Buildings with built up area of more than 20000 metre square and townships with area more than 50 Ha or 150000 square metre of built up area comes under it. A thorough report is made for the possible outcomes of the project (i.e..it's impact on surrounding environment). If the impact is within the limits as specified by MoEF and SEAC, it is sent for approval otherwise client is suggested to take corrective steps. Scope of the topic trespasses the boundaries of green house gas emissions and global warming, water and energy crises, carbon emission and sequestration, environmental pollution of various kind. It was EIA that brought in an element on environment in all projects. It lead to eco friendly and sustainable construction techniques which paved way for the concept of green building. Today EIA and environmental clearance are the only protectors of environment from the greeds of corporate sector across globe. If applied with stringency it will usher us to an era where any advancement will be apsolutely in tune with nature.This technical paper deals with the birth and growth of EIA in the world and in India. It deals with the processes that are involved in carrying out EIA for a project and subsequently providing it with environmental clearance. Also it emphasizes on how EIA led to a general awareness and paved way for the concept of sustainable construction.

Keywords - EIA, EIC, GRIHA, NEPA, Sustainable Construction

I. Introduction

Environmental Impact Assessment can be broadly defined as the systematic identification, evaluation and monitoring 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 legal planning tool that is now generally accepted as an integral component of sound decision making of whether to proceed with a project. The prime objective of EIA is to predict and address potential environmental threats at an early stage of project planning and design. EIA systematically examines both beneficial and detrimental consequences that an upcoming project is going to have and ensures that these effects are taken into account during project design.

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

II. Formal Birth – As The NEPA Process

The phrase Environmental Impact Assessment comes from Sec. 102 (2) of the National Environmental Policy Act (NEPA) – 1969, USA. NEPA ushered USA in a new era of environmental awareness by requiring federal agencies to include environmental protection in all their plans and activities to be undertaken 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, which was a breakthrough.



Figure 1- NEPA Process

III. EIA and World

Once the concept of EIA, its benefits and importance in protecting the environment was realized, soon it became an essential need and was incorporated into the framework of several international organizations. Some of these organizations were directly involved in funding developmental projects in developing nations. Thus, with the advent of EIA and EC procedures, a direct policy based legal 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:

- i. Legally binding international documents such as international treaty and protocol (Montreal Protocol, Kyoto Protocol).
- ii. Non-legally binding international documents such as resolutions, recommendations and declarations by international organizations.
- iii. Guidelines for development assistance.
- iv. Guidelines for overseas projects.

IV. EIA in India

Historical Perspective

The foundation of environmental impact assessment (EIA) in India was first laid in 1976-77 when the Planning Commission asked the then Department of Science and Technology (DST) to examine all the river-valley projects from an environmental angle. This was subsequently extended to cover those projects, which required an approval from the Public Investment Board. However, these were administrative decisions, and didn't have 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 this 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 of 1986, promulgated an EIA notification making Environmental Clearance (EC) mandatory for any expansion or modernization 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.

Steps in EIA

- i. **Screening:** This is the first stage of EIA, which determines whether the proposed project, requires an EIA and if it requires EIA, then the level of assessment required.
- ii. **Scoping:** This stage identifies the key issues and impacts of the project that should be further investigated. This stage also defines the boundary and time limit of the study.
- iii. **Impact analysis:** This stage of EIA identifies and predicts likely environmental and socio economic impact of the proposed project and evaluates its significance.

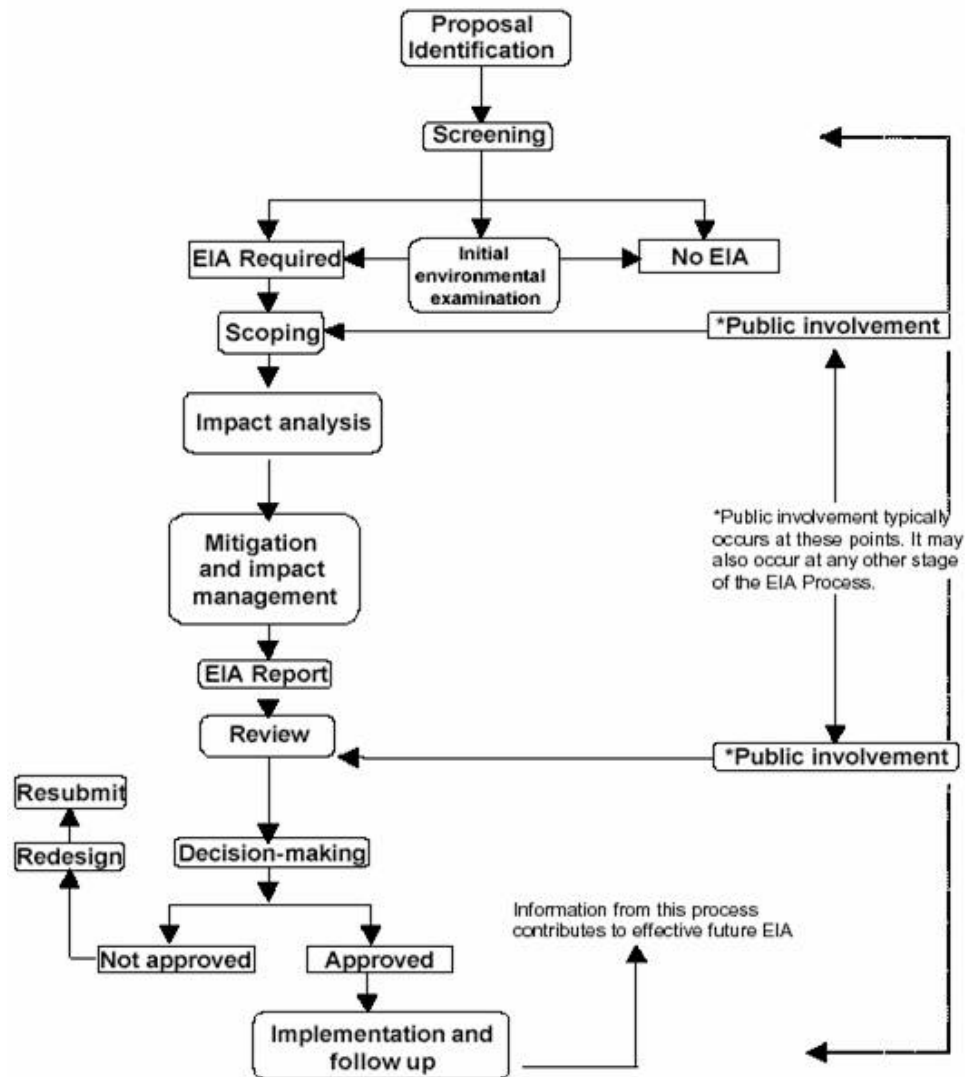


Figure 2- Flowchart showing the EIA Process

- iv. **Mitigation:** This stage in EIA recommends the steps to reduce and avoid the potential adverse environmental consequences of development activities.
- v. **Reporting:** This stage presents the result of EIA analysis in a form of a report to the decision-making body and other interested parties.
- vi. **Review of EIA:** It examines the adequacy and effectiveness of the EIA report and provides information necessary for the decision-making (granting clearance).
- vii. **Decision-making:** It decides whether the project is rejected, approved or requires further change.
- viii. **Post monitoring:** This stage plays its role once the project is commissioned. It checks whether the impacts of the project exceeds

the legal standards and implementation of the mitigation measures are in the manner as described in the EIA report.

EIA Notifications 1994 & 2006

The environmental impact assessment 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 emphasize for more sustainable industrialization process in the country after giving due consideration to environmental, social and economic factors. For doing so, the notification imposed restrictions and legalities on setting up, modernizing or expanding any project (new or already existing) or proposal without getting an environmental clearance from the government.

The new EIA notification was introduced by the Ministry of Environment and Forests (MoEF) on September 14, 2006. The major difference in the New EIA Notification, 2006 from the earlier version of 1994 is its attempt to decentralize power to the State Governments.

As per the new notification, significant number of projects will go to the state govt. for getting clearance depending on its size/capacity/area. For this, the notification has made a provision to form an expert panel, the State Environment Appraisal Committees at the State level (SEAC) headed by a chairperson. This is a good attempt to reduce the burden on the Central Government and consequent delays which used to be a big problem.

V. Improving Impact assessment in India

Conservation, protection and preservation of the environment have been the prime motives of the Indian ethos, culture and traditions. These values are also enshrined in our Constitution as well, which is one of the first in the world to recognize the importance of environmental protection.

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 as the backdrop and the concept of sustainable development in the forefront, the Environmental Impact Assessment (EIA) was first notified in 1994 as the primary method for obtaining Environmental Clearance (EC).

India's cultural diversity is vast. The fact that the poorest of Indians live in areas that are rich in terms of natural resources and biodiversity emphasizes the importance of a proper EIA, in the event that new projects are proposed at any of these parts of the country. This is because the direct impact of such projects will fall on these poor people and any development at this cost will eventually be unsustainable. The following paragraphs include some basic features that should be inherent to not just Environmental Impact Assessment (EIA) but any Impact Assessment protocol in India.

Interdisciplinary Team Formation

Simply put an interdisciplinary team is made up of a group of people, trained in different fields, who interact with one another to produce a coordinated EIA report. The Centre for Interdisciplinary Studies on Mountain and Hill Environment (CISMHE, Delhi University) is one of the few Impact Assessment

centres in the country that has a proper interdisciplinary team which works in a complete interdisciplinary environment.

Usually this team consists of a project manager, an ecologist, a biologist, a geologist and a regional planner etc.

An interdisciplinary team for a specific impact study can be considered as a temporary entity which has been assembled and appointed for meeting the identified purpose of conducting an EIA for a particular project.

Traditional Ecological Knowledge And EIA

Traditional Knowledge is a cumulative body of knowledge, beliefs and ideas handed down through generations by cultural transmission about the relationship of living things (including humans) with one another and with their environment.

It is a fact that in India some of the poorest people (and tribals) inhabit areas which are rich in natural resources of various kinds. In this light 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.

Environment Information Centre (EIC)

A common and widespread allegation that civil societies and NGOs have always been making against some of the EIA agencies is that these agencies often do not 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 problem could be resolved.

The prime objective of EIC is to be like a one stop source for high quality environmental data on India and other related information in a timely and cost-effective manner, so as to improve environmental studies, project screening, scoping, monitoring and facilitate decision-making process.

Strategic Environmental Assessment (SEA)

SEA is a formal, systematic process to analyze, assess and address the environmental effects of policies, plans and programmes and other strategic initiatives. This process applies mainly to the development-related initiatives that are known or likely to have significant environmental impact, notably those in sectors such as transport and energy or collectively through spatial or land use change.

This process extends the scope and objectives of EIA upstream, in the decision-making process, beyond the project level and when major alternatives are still open. SEA is a proactive approach to

integrate environmental considerations into the higher levels of decision-making.

VI. Future of EIA in India

All of India's developmental policies are adopting the sustainable development philosophy. It is now being realized that development is no doubt inevitable but it should be 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 undertaken only sustainable and carefully planned projects for EC in the country. The new Notification has certain drawbacks which will be taken care by bringing necessary amendments from time to time. India is on a development spree and all initiatives, rules and regulations should be aimed to complement as well as supplement the economic growth of the country.

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

VII. Need For Sustainable Development / Construction

EIA and EC has drawn the attention of masses towards the degradation of environment because of human activities. It has created a general awareness as well as formed laws with which all have to abide by. Change in climate, caused by the emission of greenhouse gases (primarily carbon dioxide) into the atmosphere and the consequent global warming has been recognized as one of the greatest threats of the 21st century.

Global warming can cause a 20% decline in the world's GDP as this phenomenon increases the possibility of occurrence of natural disasters altering the world's GDP. It may lead to melting of glacial ice caps, increasing the sea level and causing a submergence of the coastal world. Also the rate at which our fossil fuel reserves are vanishing suggests that we would run out of oil by 2052. Natural gas and coal deposits would give us an additional 36 years taking us maximum to the end of this century if new reserves are not discovered.

The first step in this regard was the United Nations Framework Convention on Climate Change (UNFCCC) treaty in 1992. Then the consequent Kyoto Protocol on 11 December 1997 followed.

Share of the global energy consumption in India and China has also been on the rise due to heavy industrialization, urbanization, population explosion, and growth of IT. Buildings are the prime energy

consumers in all cities accounting upto 40 to 45% energy consumption.

In recent times the need for sustainability has gained remarkable momentum globally. International treaties such as The Kyoto Protocol, Basel Convention, The Rio Declaration have compelled leading industrial countries to form environmental rules and legislations.

World studies have found, buildings were responsible for 7.85Gt, or 33% of all energy-related CO₂ emissions worldwide (Price et al., 2006) and these emissions are expected to grow to 11Gt (B2 scenario) or 15.6Gt (A1B scenario) by 2030.

In India there is an urgent need to improve the energy efficiency of the construction sector. About 70% of the infrastructure in 2032, such as buildings, will be added in the two decades between 2012 and 2032. The projection for energy demand in 2032 implies a fourfold increase in requirements. Thus, this means that building's EIA and EC procedures need special attention.

VIII. Energy Efficient Built- Green Buildings

Green Building (GB) is synonymous with 'high performance buildings', 'green construction', 'sustainable construction' as well as other terms that refer to a holistic approach to design and construction. Its principle revolves around 4 R's namely Reduce, Reuse, Recycle and Renewable which are in tune with the intentions of EIA and EC.

The external appearance of a green building is similar to any other building. However, the difference is in its intention which revolves around conservation of natural resources, provide human comfort, safety and productivity. This approach results in reduced operating costs like low energy bills, low water consumption, besides several other intangible benefits.

Green Building design strives to balance environmental responsibility, resource efficiency, occupant comfort and health and community sensitivity. The Green Building design consists of all players in an integrated development process, from the design team (architects, engineers), the construction team (contractors), maintenance staff and building occupants. The green building process results in a product that maximizes the owner's returns on investment by sustained savings of energy (40-50%), water savings (20-30%) and a smaller payback period.

The Green building movement in India gained tremendous momentum after the CII-Godrej GBC, Hyderabad embarked on achieving the prestigious LEED platinum rating in July 2004. This sparked off considerable enthusiasm and by the end of 2013 India had more than 1.28 billion sq.ft. of green building area (IGBC data).

IX. Green Building Ratings in India Leadership in Energy and Environmental Design Rating system (LEED), INDIA

LEED, a product of the U.S. Green Building Council (USGBC), provides a complete and comprehensive framework for assessing building performance and meeting sustainability goals within 6 category rating system.

The categories are: sustainable sites, water efficiency, energy & atmosphere, materials & resources, indoor environmental quality and innovation & design.

LEED is a point based certification system. The total points attained within these categories will determine which level of LEED certification the project is awarded.

There are 69 possible points and four certification levels. Basic LEED Certification requires 26 to 32 points.

GRIHA : Green Star Rating System

Founded by The Energy And Resources Institute (TERI), New Delhi, it identifies projects that have demonstrated a commitment to sustainability by designing, constructing or owning a building to a determined standard. GRIHA certification system consists of 34 criteria for rating under 4 categories namely Site selection and planning, Building planning and construction, Building operation and maintenance and Innovation.

Various levels of certification (one to five star) are awarded based on the number of points earned (max. 100). The minimum points required for certification is 50.

Incentives to GRIHA certified Projects

GRIHA rated projects are entitled with various incentives from the state and central governments and other concerned authorities e.g.

- 1) Incentives from the MoEF: GRIHA pre certified projects are entitled to receive fast track EIA & EC from MoEF. Fast track process enables project to save at least 3 months.
- 2) Ministry of New and Renewable Energy has announced that 90% of registration cum rating fee will be reimbursed for projects having built up area less than 5,000 sq.m with minimum 3 star rating and built up area more than 5,000 sq.m with minimum 4 star rating.
- 3) Ministry of Urban Development, Government of India has announced free of cost 1 to 5 % extra ground coverage and FAR for GRIHA rated projects of plot size more than 3,000 sq.m.

X. Constraint And Challenges

a. The first and foremost constraint for the widespread acceptance of EIA is the lack of information and incorrect perception. It is generally

believed that EIA processes are costly and unnecessarily lengthy.

b. The required support from government in terms of providing fast track process, incentives granted to the developers for constructing green has to increase. Uniformity in the policy for incentives should be present.

c. There should be no scope of corruption in environmental clearance granting bodies such as MoEF, SEAC. Strict vigilance should be present.

d. Lack of professional knowledge, consultancy services for facilitation of EIA process & EC certification is still present. However with time awareness on sustainability in India, competency among consultants, and skills in the construction and real estate industry is increasing. This will in turn facilitate developers with their required professional support.

XI. Conclusion

While development is inevitable and 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. Presently, EIA 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.

Even though development is required, it is neither scientific nor 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 point of view but is also economically incorrect.

The 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 in all sectors. 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 mistakes with the long term sustainability of their development plans.

Today the need of the hour is to find innovative ways for carrying out EIA process under limited costs, time and available expertise. At the same time, EIA should to be standardized for respective countries so that a common framework is followed.

Components such as 'incorporating traditional knowledge for baseline study', forming a proper interdisciplinary team, etc. may seem small issue but go a long way in determining the 'impact' of the EIA

report in minimizing and mitigating environmental issues.

Reference

- [1] Asian Development Bank, (1997). 'EIA for Developing Countries' A report on strengthening EIA in the Developing World.
- [2] Canter, L., and Sadler, B., (1997). "A tool kit for effective EIA practice – review of methods and perspectives on their application." For International Association of Impact Assessment (IAIA).
- [3] Canter, L.W., (1996). Environmental Impact Assessment (Second Edition), Published by McGraw-Hill Inc.
- [4] Explanatory Notes 'EIA Notification, 1994 (Updated upto 7th July 2004 amendment) and a Note on the new EIA Notification, Manju Menon and Kanchi Kohli for Kalpavriksh Environment Action Group.
- [5] Impact Assessment and Project Appraisal, Volume 18, No. 4, December 2000, pages 295–307, Beech Tree Publishing, 10 Watford Close, Guildford, Surrey GU1 2EP, UK.
- [6] IGBC (2011), "Indian Green Building Council: LEEDw-NC India", available at: www.igbc.in
- [7] GRIHA Manual Vol. 1, Ministry of New and Renewable Energy, Government of India, and The Energy and Resources Institute, New Delhi
- [8] Websites visited:
 - <http://www.iaia.org>
 - <http://moef.nic.in>
 - <http://www.worldbank.org>
 - <http://unep.org>
 - <http://www.oecd.org>
 - <http://www.eicinformation.org>