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EIA Guidelines for Airport

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ABSTRACT

Environmental impact assessment (EIA) was first introduced in India based on the Environmental Protection Act (EPA), 1986. But formally it came in to effect, when Ministry of Environment and Forest (MoEF) has passed a major legislative measure under EPA in January 1994 for Environmental Clearance (EC) known as EIA Notification, 1994. Subsequently, EIA processes have been strengthened by MoEF by a series of amendments.The current practice is adhering to EIA Notification, 2006 and its amendments. The pieces of evidence collected and analysis in the present assessment suggest that, despite a sound legislative, administrative and procedural set-up EIA has not yet evolved satisfactorily in India. An appraisal of the EIA system against systematic evaluation criteria, based on discussions with various stakeholders, EIA expert committee members, approval authorities, project proponents, NGOs and consulting professionals, reveals various drawbacks of the EIA system. These mainly include; inadequate capacity of EIA approval authorities, deficiencies in screening and scoping, poor quality EIA reports, inadequate public participation and weak monitoring. Overall, EIA is used presently as a project justification tool rather than as a project planning tool to contribute to achieving sustainable development. While shortcomings are challenging, Government of India is showing a high degree of commitment. The EIA system in the country is undergoing progressive refinements by steadily removing the constraints. The paper identifies opportunities for taking advantage of the current circumstances for strengthening the EIA process.

Keywords : Environmental impact assessment (EIA), EIA process.

I. INTRODUCTION

1.1 Environmental Scenario of India

India is a large, diverse and developing country that faces severe environmental problems. It is the world's second most popular country with almost a billion people and is the seventh largest in terms of area. In absolute size, its economy is one of the biggest in the world. India is a pluralistic democracy with a federal structure. Competing claims on the basis of religion, caste, class, and ethnicity have to be balanced in the society, polity, and the economy. All of this has an important bearing on the environment and on environmental policy.

1.2 What is EIA?

Environmental impact assessment (EIA) is a policy and management tool for both planning and decision-making. EIA assists to identify, predict, and evaluate the foreseeable environmental consequences of proposed development projects, plans, and policies. The outcome of an EIA study assists the decision maker and the general public to determine whether a project should be implemented and in what form. EIA does not make decisions, but it is essential for those who do.

Environmental assessment (EA) refers to an understanding of the present status of environmental impacts and a study of how to manage them. An environmental impact statement (EIS) is the final step of an EIA/EA exercise where the conclusions of the assessment are put out in a communicable form to the concerned developer or authority. There is thus a distinction between the terms EIA, EA. and EIS.

A frequent opinion is that an EIA should usually only examine or look into the possible negative consequences of a project on the environment. Any positive issues

emerging from the development are taken as stated by the project proponent or the developer. However, EIA is not restricted or biased to the examination and mitigation of negative impacts alone. EIA can also look into the possible positive issues due to the developmental projects and explore or suggest ways of enhancing them.

1.3 Objective of EIA

The objective of EIA is 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.

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

II. METHODS AND MATERIAL

2. Environmental Impact Assessment Methodology

A number of methodologies have been developed after the inception of the NEPA for evaluation and assessment of environmental impacts. Most of the methods suffer from excessive dependence on subjective judgments and are weak in predicting and quantifying the impact of the project on the environment, but the development of computer-based modeling techniques shows promise of bridging the existing gap (Banerjee, Rathore 1994). Some of the important methods developed over the period are discussed below.

2.1 Ad hoc approach

This is the oldest and perhaps the crudest approach to EIA. The method provides very little guidance for assessing impacts on specific parameters beyond suggesting impacts on broad areas like impact on land, forests, population, water, wildlife, etc. It does not address secondary impacts.

2.2 Checklist

It is the updated version of the ad hoc approach in which specific areas of potential impacts are listed. Checklists are the lists of environmental attributes. The evaluator needs to tick against each environmental parameter for adverse, beneficial, or effects due to proposed project activities. The method defines the parameters to be evaluated, but it is usually very large, very subjective, and provides little guidance that can aid in the decision-making process.

2.3 Matrix method

The method is attributed to Leopold et al. (1971). The method uses a matrix format to relate project actions and environmental components. The column of the matrix consists of 100 project actions (can be shortlisted as per requirement) against rows of the matrix of 88 environmental components (also can be shortlisted as per the project). If a project action is likely to make an impact on environmental components, the appropriate cell is scored for magnitude and importance of the impact (on an arbitrary scale). A +ve or -ve sign is provided for harmful or beneficial nature of the impact. Row totals of the matrix reflect the total impact of all project actions on one environmental component, while the column totals reflect the impact of one project action on all components of the environment. The matrix total gives the total environmental impact. One of the drawbacks of matrix approach is that it generally does not include secondary impacts. Also, the Leopold matrix is a non-mathematical matrix where true algebraic operations cannot be performed. A number of mathematical matrix methods have also been developed, namely, the Peterson's matrix, the component interaction matrix, etc, that try to address inclusion of secondary impacts and allow true algebraic operations.

2.4 Mathematical matrices

The matrix was developed by Peterson, Gemmell, Schofer (1974) and called the Peterson's Matrix. First, a matrix is formed to evaluate the effects of environmental action on the various physical components of the environment on a scale of +3 to -3. Another matrix is

constructed to evaluate effects of the impacted physical components on human environment. Matrices are then multiplied to give a third matrix that brings out the effect of actions on the human environment. The production matrix is operated by a vector of relative weight of human impacts to result in a weighted vector of human impacts. The weighted vector is then summed up to result in a total value of the project impact. The approach has been criticized for too much of mathematical operations. It is also difficult to carry out the multiplication of matrices manually, and basic inputs to the matrix are still subjective.

2.5 Network approach

This approach links the project and its impacts in an easily understandable format. The network method aims at working from a list of project activities and establishes cause, condition, and effect relationships. Since the environmental system is dynamic and action-impacting, certain environmental parameters can lead to a series of impacts on other environmental parameters. The network method primarily addresses the need by defining a set of possible networks and allowing the user to identify impacts by selecting and tracing appropriate project actions. This approach has been identified as one of the best approaches for assessing higher-order impacts, although quantification of impacts is still subjective in nature.

2.6 Modeling Approaches

A large number of mathematical models have been developed for the assessment and simulation of a number of environmental attributes like air quality, water quality, noise, and behavior of biological systems. The approaches aim at modeling the environmental parameters for future prediction of impacts in quantitative terms. Key features of this approach include the ability to give the non-mathematical experts the capacity to model complex, and non-linear feedback systems. A major problem in the modeling approach to decision making is the scaling of judgment. Modeling the environment as a whole is a resource intensive and time-consuming procedure, which requires a significant level of expertise.

3. Why to conduct an EIA

- The State's responsibility with regard to environmental protection has been laid down under Article 48-A of our Constitution, which reads as follows: "The State shall endeavor to protect and improve the environment and to safeguard the forests and wildlife of the country".
- Environmental protection is a fundamental duty of every citizen of this country under Article 51-A(g) of our Constitution, which reads as follows
- "It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures."
- Article 21 of the Constitution is a fundamental right, which reads as follows: "No person shall be deprived of his life or personal liberty except according to procedure established by law
- Article 48-A of the Constitution comes under Directive Principles of State Policy and Article 51 A(g) of the Constitution comes under Fundamental Duties
- The State's responsibility with regard to raising the level of nutrition and the standard of living and to improve public health has been laid down under Article 47 of the Constitution, which reads as follows: "The State shall regard the raising of the level of nutrition and the standard of living of its people and the improvement of Public health as among its primary duties and, in particular, the State shall endeavor to bring about prohibition of the consumption except for medicinal purposes of intoxicating drinks and of drugs which are injurious to health."

4. EIA process and procedures

The EIA process in India is made up of the following phases

4.1 Screening

Screening is done to see whether a project requires environmental clearance as per the statutory notifications. During the screening process the developer has to evaluate whether a formal EIA is required for the project. It is the responsibility of the competent authority

to decide whether an EIA is required and then make the decision public. The developer can also decide to voluntarily undertake an EIA without the formal screening decision from the competent authority. Volunteering to undertake an EIA can save time and costs later in the process.

4.2 Scoping and Consideration of Alternatives

Scoping is a process of detailing the terms of reference of EIA. It has to be done by the consultant with the project proponent and guidance, if need be, from Impact Assessment Agency. The scoping stage sets the coverage and detail of the EIA process. Scoping evaluates which impacts and issues to consider and ensures that the impact evaluation provides all the relevant information. Generally scoping takes place between the developer and the competent authority. During the scoping stage those to be consulted, such as Communities, local authorities and statutory agencies, are identified. The scoping ought to specify the project in such detail that potential direct, indirect and cumulative impacts can be identified at a later stage.

Description of the project/development action includes information about the purpose and rationale of the project and an understanding of its various characteristics, such as development location and processes.

Description of the environmental baseline should include present and the possible future state of the environment, assuming that the project is not undertaken. The time span should be the same as for the project. Baseline data project description and mitigation measures should be developed with monitoring implications in mind.

4.3 Impact Analysis and Mitigation

During this stage issues identified through scoping are analyzed and the impacts are defined. The prediction of impacts aims to identify the magnitude and other dimensions of identified change in the environment with or without the project, based on the baseline information gathered during the scoping stage. The significance of impacts could also cast new light on the scoping exercise.

Types of impacts to be considered during the prediction of impacts

- Physical and socio-economic
- Direct, indirect and cumulative
- Short and long run
- Local and strategic adverse and beneficial
- Reversible and irreversible
- Quantitative and qualitative
- Distribution by group and/or area
- Actual and perceived
- Relative to other developments

Assessment of impacts assigns relative significance to predict impacts associated with the project, and to determine the order in which impacts are to be avoided, mitigated or compensated. Mitigation consists of measures to avoid, reduce and if possible to remedy significant environmental effects. At one extreme, prediction and evaluation of impacts can lead to such adverse effects that the only sensible mitigation measure is to abandon the project. Like many elements in the EIA process, mitigation is not limited to one point of assessment.

4.4 Base Line Data Collection

Base line data describes the existing environmental status of the identified study area. The site-specific primary data should be monitored for the identified parameters and supplemented by secondary data if available.

4.5 Impact Prediction.

Impact prediction is a way of mapping the environmental consequences of the significant aspects of the project and its alternatives.

4.6 Assessment of Alternatives, Delineations of Mitigation Measures and Environmental Impact Statement

For every project, possible alternatives should be identified and environmental attributes compared. Alternatives should cover both project location and process technologies. Alternatives should consider no project option also. Alternatives should then be ranked

for selection of the best environmental optimum economic benefits to the community at large.

4.7 Public Hearing

After completion of EIA report the law requires that the public must be informed and consulted on a proposed development after the completion of EIA report.

4.8 Decision-Making

The decision making process involve consultation between the project proponents and the impact assessment authority.

4.9 Monitoring the Clearance Conditions

Monitoring should be done during both construction and operation phases of a project. This is not only to ensure that the commitments made are complied with but also to observe whether the predictions made in the EIA reports were correct or not.

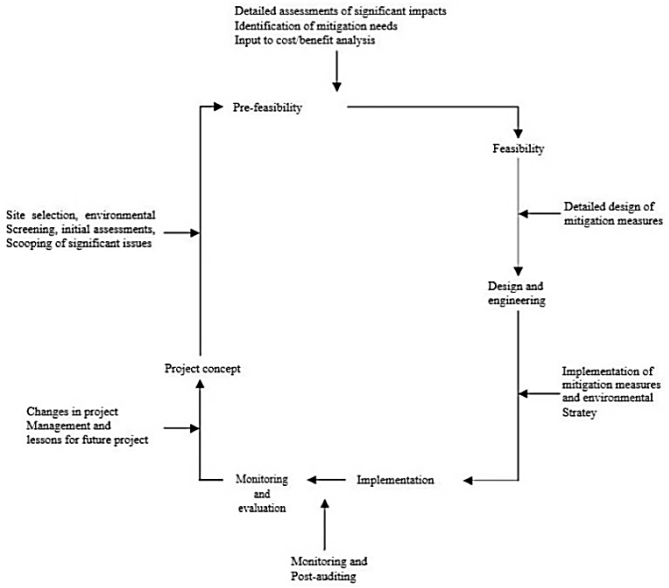
III. RESULTS AND DISCUSSION

5. Who Is Involved In The EIA Process?

EIA is generally the responsibility of the project proponent and is often prepared with the help of external consultants or institutions, i.e., the EIA practitioners. In some cases, an independent commission is responsible for ensuring quality control throughout the implementation of the impact assessment, for setting appropriate terms of reference, and/or for the external review. The EIA study should be carried out by a multi-disciplinary team comprising civil engineers, water supply and sanitation engineers, planners, chemists, life scientists, and socio-economists.The agency responsible for receiving the impact assessment report and taking any subsequent action, i.e., the implementing agency, will usually indicate how the study is to be carried out and how the results should be used in the decision-making process. The institutional structures and agencies responsible for the management and implementation of EIA vary amongst countries, reflecting different political, economic, and social priorities. Mostly, they include local government agencies, NGOs, research institutions, and affected groups feeding into a specialist environmental unit within the implementing agency.

5.1 When should the EIA be undertaken?

The EIA needs to be managed so that it provides information to decision makers at every stage of the project planning cycle. Figure shows the various options for conducting EIA vis-a-vis the project.



5.2 Effectiveness of EIA

Mere promulgation of laws and regulations is not sufficient to ensure that the benefits of EIA are maximized. To ensure an effective EIA some conditions should be fulfilled and some of these are summarized below.

5.3 Legal regulations

EIA must be promulgated by law in an unambiguous regulation, leaving no misunderstanding about the interpretation of the obligation to carry out EIA.

5.4 Rational and open decision-making

EIA performs best in a model of rational decision-making in which one designated authority (i.e. the competent authority) makes a crucial decision based on factual information and rational arguments. Experience shows that it is crucial to start an EIA procedure in an

open way; there should be enough room to consider alternatives and to absorb information.

IV. CONCLUSION

The Environment rules and regulations are very necessary in the interest of the nation. It is the duty of every citizen of the nation to abide by these rules and regulations. From the study it is quite evident that the Environment Procedures and Regulations do not have any adverse impact on the construction of Airport Projects. The procedure involved in obtaining Environment Clearance may be strict and laborious, but most of the projects get delayed or rejected due to nonconformance to the prescribed rules, regulations and guidelines.

The EIA process results in greater environmental awareness among the stakeholders and ideally the decisions ought to reflect this. However, EIA is only an aid to the decision-making process, making it more transparent and informed, but it is not a decision making tool in itself and does not guarantee environmentally sustainable outcomes. The EIA process can only lead to a decision beneficial for the environment due to the long process time that is involved in getting clearance or due to negligence ignorance on the part of airport planning authorities to incorporate in detail the environmental issues that have to be taken care of in the planning stage itself. Hence, it is very necessary to have a thorough knowledge of all the environmental aspects related to the particular project and incorporate the same right in the planning stage itself.

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