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" ENERGY PROJECTS AND ENVIRONMENTAL IMPACTASSESSMENT (EIA)"

AUTHOR: GARIMA SHREE | STUDENT (5TH YEAR), KIIT SCHOOL OF LAW, BHUBANESWAR

INTRODUCTION:

Energy production is an indispensable aspect to economic development, industrial expansion, technological advancement, and the improvement of living standards. However, the construction and operation of energy projects frequently have significant negative effects on the environment, such as habitat loss, air and water pollution, deforestation, ecological imbalance, and local community relocation. Modern legal and regulatory systems have the task of not only facilitating growth but also ensuring that it stays within ecologically acceptable bounds as energy needs continue to rise. In this regard, the Environmental Impact Assessment (EIA) has become an important regulatory tool for analyzing the potential environmental effects of proposed projects prior to approval.

The scope, intricacy, and long-term consequences of energy projects has made EIA even more crucial. Thermal power plants, hydropower projects, mining-related energy infrastructure, and renewable energy installations all pose unique environmental concerns that need to be carefully identified and assessed. With a focus on its role as a tool for striking a balance between developmental goals and environmental protection, sustainability, and responsible decisionmaking, this article explores the role of EIA in the governance of energy projects.

Keywords: Environmental Impact Assessment (EIA), Energy Projects, Sustainable Development, Public Participation, Environmental Governance, Renewable Energy, Ecological Risk, Regulatory Compliance.

REVIEW OF LITERATURE:

It was examined that the quality of environmental management programmes contained in Indian EIA reports and finds that these programmes are often weak in terms of monitoring, compliance, and implementation. The study is significant because it shows that the effectiveness of Environmental Impact Assessment cannot be evaluated only at the stage of environmental clearance. Rather, the real strength of the EIA process also depends on the quality of post-clearance environmental management and follow-up mechanisms. This contribution is particularly relevant to energy projects, where environmental impacts are often long-term and require continuous monitoring and regulatory oversight (Rathi, 2019).

The Indian EIA framework in the context of developmental activities and highlights that public participation in India frequently remains procedural rather than substantive. The paper suggests that although public consultation is formally recognised as an important part of the EIA process, its practical impact on decision-making is often limited. This is important because it demonstrates that the gap between legal procedure and actual implementation continues to

weaken the role of EIA as a tool of environmental governance, especially in large infrastructure and energy-related projects (Rathoure, 2021).

The treatment of climate concerns in renewable energy projects within the EIA process and finds that such projects are often assessed mainly in terms of their climate-related benefits, while their indirect or adverse environmental consequences receive less attention. The paper is important because it challenges the assumption that renewable energy projects are inherently sustainable. Its central contribution lies in emphasising the need for balanced environmental scrutiny of all forms of energy infrastructure, including those associated with climate mitigation goals (Larsen, 2014).

OBJECTIVE OF THE STUDY:

Through this paper I aim to analyse the role and effectiveness of Environmental Impact Assessment in regulating energy projects while also studying the following:

- To examine the environmental risks associated with different categories of energy
- To study the legal and procedural framework governing EIA in relation to such
- To assess whether the existing EIA mechanism adequately balances developmental and environmental concerns.
- To identify major shortcomings in the present framework and suggest

RESEARCH METHODOLOGY:

This research is doctrinal in nature and is based on secondary sources such as books, journal articles, research papers, case laws, statutes, government reports and official websites. The study uses a descriptive and analytical approach to understand the role of Environmental

Impact Assessment in energy projects. It also examines the legal framework and key issues to evaluate how far EIA helps in balancing development and environmental protection.

CONCEPT AND SIGNIFICANCE OF ENVIRONMENTAL IMPACT ASSESSMENT:

Environmental impact assessment or EIA has been defined by the International Association for Impact Assessment (IAIA) as "the process of identifying, predicting, evaluating and mitigating the biophysical, social and other relevant effects of development proposals prior to major decisions being taken and commitments made."

EIA is the process of assessing a project's or development's anticipated environmental effects while accounting for interconnected socioeconomic, cultural, and human health effects, both positive and negative. Environmental assessment offers several advantages, including environmental preservation, efficient use of resources, and time and cost savings, by taking into account the project's environmental consequences and their mitigation early in the project planning cycle. By encouraging community involvement, educating decision-makers, and laying the groundwork for ecologically sustainable initiatives, a properly executed EIA also reduces disputes. All phases of a project, from planning and exploration to building, operations, decommissioning, and beyond site closure, have shown benefits from incorporating EIA.

HISTORICAL DEVELOPMENT OF EIA IN INDIA:

Environmental Impact Assessment in India began as an administrative practice rather than a fully developed statutory requirement. Its early foundation is generally traced to 1976-77, when the Planning Commission asked the then Department of Science and Technology to examine river valley projects from an environmental perspective. This approach was later extended to other projects requiring approval from the Public Investment Board. At that stage, environmental clearance existed mainly as an executive and policy-based process, without a strong legislative framework.

With the enactment of the Environment (Protection) Act, 1986, which gave the Central Government the authority to regulate environmental activities and take action to safeguard the environment, a clearer legal foundation was created. On January 27, 1994, the government used this statutory authority to issue the EIA Notification, which required prior environmental approval for some types of development projects. This signaled a significant change from an administrative procedure to a clearance system with legal framework.

The EIA Notification, 2006, which introduced the current system of project classification into Category A and Category B, decentralized appraisal to the state level for some projects, and formalized stages like screening, scoping, public consultation, and appraisal, significantly altered the framework. Thus, the history of EIA in India shows a gradual movement from limited project review to a broader legal mechanism for environmental decision-making.

LEGAL FRAMEWORK OF EIA IN INDIA:

The Environment Protection Act of 1986 governs EIA laws in India, which are operationalized through the EIA Notification 2006 (with modifications until March 2025). These regulations guarantee sustainable development while safeguarding India's natural heritage. It offers the main legislative framework, outlining project classifications, clearance processes, and environmental assessment criteria.

The 2006 Environment Impact Assessment Notification has established two project categories which allow environmental clearance projects to operate in different regions. The system consists of two project categories which require different evaluation processes. Projects that require national level assessment fall under Category A whereas Category B projects need state level assessment.

- Category A projects are those projects that, owing to their scale, nature, or potential environmental impact, are subjected to central level appraisal in the EIA These projects are examined by the Expert Appraisal Committee, and environmental clearance is provided by the Ministry of Environment, Forest, and Climate Change. As such, they are deemed to be projects that may have a significant impact on the environment, and thus they require prior environmental clearance. As a result, they do not undergo a screening stage. Instead, they are subjected to central level scrutiny through techniques such as scoping, public consultation, and expert evaluation.
- Category B projects include the ones that are considered to have relatively more localised environmental impacts and hence are appraised at the state level. In the appraisal of such projects, the State Expert Appraisal Committee (SEAC) is involved, while the State Environment Impact Assessment Authority (SEIAA) is involved in the environmental clearance of the project. Unlike the case with Category A projects, in the case of Category

B projects, screening is conducted first. In the screening process, the project is further classified as either B1 or B2. While B1 projects involve the conduct of a detailed EIA study, B2 projects are exempted from the requirement of a detailed EIA report.

The State Environment Impact Assessment Authority (SEIAA) handles Category B projects at the state level based on the State Expert Appraisal Committee's (SEAC) recommendations. In contrast to Category A projects, they undergo screening before being further categorized into Category B1 and Category B2. While Category B2 projects are often excluded from this requirement, Category B1 projects must provide a thorough EIA report. Nonetheless, the Category B proposal is taken into consideration at the central level even while it still maintains its status as a Category B project in cases where a State or Union Territory lacks a properly established SEIAA or SEAC.

This distinction is important because it determines the depth of environmental scrutiny that a project will undergo. Screening, however, applies only to Category B projects. Category A projects do not go through screening because they automatically require appraisal at the central level.

Key regulatory bodies include:

· Ministry of Environment, Forest and Climate Change (MoEFCC):

The MoEFCC is the central authority in charge of India's overall comprehensive environmental management and policy. According to the EIA framework, it deals with some Category B projects where general conditions apply and brings them under central evaluation in addition to giving environmental clearance to Category A projects. In addition to issuing notices, modifications, and policy directives, it oversees the environmental clearance system's overall operation and is crucial in ensuring that projects with larger environmental consequences are reviewed at the national level.

· State Environment Impact Assessment Authority (SEIAA):

The SEIAA is the state-level authority responsible for granting environmental clearance to Category B projects. It serves as the state's decision-making body and implements the State Expert Appraisal Committee's recommendations. Because it enables projects with more localized impacts to be evaluated closer to the ground while still adhering to the larger legal framework of the EIA Notification, 2006, it plays a crucial role in decentralizing the clearance process.

· Expert Appraisal Committee (EAC) and State Expert Appraisal Committee (SEAC):

The professional bodies conduct technical assessments for their projects. The SEAC evaluates Category B projects while the EAC evaluates Category A projects. Their job description includes project documentation and Terms of Reference and EIA reports and Environmental Management Plans and public consultation results. They propose three options for environmental clearance which include approval and rejection and change of existing conditions. The committees serve an essential function because they assess scientific and technological aspects of research into environmental impacts.

· State Pollution Control Boards (SPCBs):

The SPCBs perform an important operational role within the EIA process, especially during public consultation. They are responsible for organising and conducting public hearings, receiving responses from affected persons and local stakeholders, and forwarding the proceedings to the concerned appraisal authority. In addition, they also contribute to environmental monitoring and compliance at the state level, particularly where pollution control and local implementation are concerned.

· Central Pollution Control Board (CPCB):

Although it does not issue environmental clearance, the CPCB is an essential component of the environmental regulatory system. It establishes national standards for pollution control, offers technical advice on environmental quality and monitoring, and encourages the creation of pollution control procedures that are pertinent to project evaluation and compliance. Its work is crucial since the CPCB develops baseline standards and pollution-related benchmarks that are frequently used in EIA appraisals.

ENVIRONMENTAL IMPACT OF DIFFERENT CATEGORIES OF ENERGY PROJECTS:

Although the technology and goals of energy projects vary, nearly all of them have a substantial impact on the environment during the phases of site acquisition, building, operation, and waste disposal. Because of this, talking about "energy projects" as a single category is insufficient. The particular hazards associated with each type of energy infrastructure as well as the potentialcumulative impact these projects may have on ecosystems and populations must be examined in a rigorous environmental impact assessment. The EIA guiding framework in India itself acknowledges that sector-specific evaluation is required for nuclear, thermal, and river valley projects, demonstrating that environmental risk differs depending on the kind of project.

Thermal power projects: These are linked to some of the most obvious types of environmental harm. High water consumption, ash production, thermal pollution, air pollution from particulate matter and gaseous emissions, and strain on nearby land and settlements are some of their main effects. Additionally, if coal transportation, ash disposal, and related industrial activity exacerbate local environmental deterioration, these initiatives may result in cumulative impacts. Before receiving environmental clearance, thermal projects must carefully consider the implications for the air, water, waste, and public health because their impacts go beyond the plant site.

Hydropower and river valley projects: They can result in land submersion, habitat fragmentation, deforestation, altered river flow, sediment disturbance, and downstream biological impacts, even though they are frequently seen as a cleaner source of electricity. They could also cause local communities to be uprooted and have an impact on livelihoods that rely on river systems. The environmental impact of hydropower cannot always be comprehended project by project in isolation since several dams within a single basin may cumulatively alter the ecology of the entire region, according to official research on cumulative impact on river basins.

Nuclear energy projects: Because of their possible radiological effects, the requirement for stringent safety measures, and the long-term problem of managing radioactive waste, they create unique problems. Because site selection, water consumption, emergency readiness,

waste management, and long-term environmental monitoring are all critical to the project's acceptability, environmental evaluation is crucial even in situations when ordinary operations are under control. Accordingly, environmental evaluation in nuclear programs is treated by International Atomic Energy Agency guidelines as an ongoing, systematic process rather than a one-time procedural necessity.

Renewable energy projects, particularly solar and wind installations: Although they are frequently thought of as more ecologically friendly, they do have some impact. While wind projects may have an impact on birds, bats, and landscapes, large solar parks may need significant land conversion and disrupt delicate ecosystems. Furthermore, the broader renewable transition relies on minerals and commodities whose exploitation may result in pollution and biodiversity loss. Because of this, even if renewable projects have significant climatic benefits, EIAs should evaluate them with the same rigor as conventional projects.

ROLE OF EIA IN THE APPROVAL AND REGULATION OF ENERGY PROJECTS:

In India, environmental impact assessments are crucial to the licensing and regulation of energy projects. Prior environmental approval is required before projects like thermal plants, hydropower projects, mining-based energy infrastructure, and other significant energy operations are carried out since they have the potential to seriously impact the environment. By mandating that the project's anticipated environmental effects be assessed before approval is given, EIA serves as a preventative measure. The following phases can be used to comprehend the function of EIA in the approval and regulation of energy projects:

1. Screening and Scoping

The EIA Notification 2006 establishes two categories for project classification through Category A and Category B. The project evaluation process determines which government level will conduct the assessment based on the project's assigned category. The authority in charge of EIA studies establishes Terms of Reference during scoping to define all projectrelated matters that need to be studied.

2. Preparation of the EIA Report

The environmental effects of the proposed energy project are examined in detail. The report assesses how the project affects land and air and water and biodiversity and local communities. The report includes an Environmental Management Plan together with mitigation strategies. The EIA report functions as the main reference document which shows how the project will impact the environment.

3. Public Consultation

Public consultation is an important part of the approval process, especially for Category A and B1 projects. The process enables affected individuals and other stakeholders to express their environmental and social impact concerns about the project. The EIA process achieves participatory development through local input which helps decision makers understand actual community conditions.

4. Appraisal and Grant of Clearance

The Expert Appraisal Committee or the State Expert Appraisal Committee evaluates the project following the completion of the EIA report and public consultation. After that, the authority

determines if environmental clearance should be given and, if so, under what circumstances. Therefore, by influencing the regulatory authority's ultimate choice, EIA directly impacts the approval of energy projects.

5. Post-Clearance Monitoring and Regulation

The role of EIA does not end once clearance is granted. The project proponent must comply with the conditions attached to the clearance and submit periodic compliance reports. Making EIA a continuous regulatory mechanism, as it helps ensure that the project remains environmentally accountable even during construction and operation. Thus, EIA is not merely a procedural requirement for obtaining approval. It serves as an important legal and regulatory tool that guides decision-making, encourages public participation, imposes environmental safeguards and monitors compliance in energy projects.

CHALLENGES IN THE IMPLEMENTATION OF EIA FOR ENERGY PROJECTS:

Environmental Impact Assessments are intended to be preventive tools, however there are often significant practical challenges when implementing them in energy projects. In India, screening, scoping, public consultation, assessment, and post-clearance compliance are all explicitly covered under the EIA Notification, 2006. Nevertheless, successful environmental protection is not always guaranteed by the presence of a method. Because energy projects are large-scale, technically complicated, and have the potential to create long-term ecological harm, the discrepancy between the legislation on paper and its actual execution becomes particularly apparent.

1. Poor Quality of EIA Reports:

The low quality of many EIA reports is one of the biggest issues with EIA implementation. In a number of instances, the studies fail to give a clear picture of the true environmental dangers associated with the proposed project and instead remain descriptive rather than analytical. Frequently, mitigation strategies are offered in a general way without adequately addressing the particulars of the project. Weak reports reduce the process's overall efficacy since environmental clearance decisions are heavily influenced by the contents of the EIA report.

2. Data Gaps and Weak Baseline Information:

Accurate baseline data on the air, water, land, biodiversity, and local communities are essential for a thorough EIA. The lack of accurate and comprehensive data, however, is a frequent problem. The impact evaluation loses credibility when baseline data is inadequate or out of date. This is especially troublesome for energy projects, because the effects on the environment might last for years and impact a wide geographic region.

3. Limited Public Participation and Stakeholder Engagement:

Public consultation was designed to give local communities and impacted individuals a formal way to express their concerns and objections before a project is approved. Because it aims to include public interest and local expertise into the clearance process, the EIA Notification views this as an important step in environmental decision-making. However, in reality, formal hearings, the technical intricacy of EIA papers, low knowledge, and restricted access to pertinent information frequently restrict participation. Weak stakeholder participation

diminishes the process's fairness, credibility, and general legitimacy in energy projects where locals may experience relocation, pollution, forest loss, or interruption of livelihood.

When issues with land acquisition, relocation, ecological degradation, and local resistance are not adequately addressed, environmental clearance procedures may become hotly contested, as seen by the controversy surrounding the Posco project in Odisha. The project's continual examination and reassessment demonstrated the limitations of formal clearance procedures in resolving more significant environmental and social disputes. The case is still pertinent because it illustrates how EIA-related decision-making can encounter legitimacy issues in large-scale industrial and infrastructural development, even if it is not a traditional energy project.

4. Inadequate Assessment of Cumulative Impacts:

Even when there are several identical projects in the same area, energy initiatives are frequently evaluated separately. Because the aggregate impact of several projects may be far higher than the impact of a single project, this causes a significant gap. Cumulative effects on forests, rivers, biodiversity, and air quality are frequently substantial in industries including thermal power, hydropower, and mining-related energy development. Environmental decision-making is weakened when these cumulative consequences are not evaluated.

5. Weak Post-Clearance Compliance and Monitoring:

The EIA should proceed after receiving environmental clearance. The Indian framework, which sees them as part of post-clearance monitoring, requires half-yearly

compliance reports. However, one of the persistent shortcomings in practice is whether or not such regulations are successfully enforced. Since many environmental issues arise during construction, expansion, and operation, inadequate follow-up can greatly diminish the efficacy of the original review for energy projects.

6. Institutional and Administrative Capacity Constraints:

The EIA system depends on several authorities, including the MoEFCC, EACs, SEIAAs, SEACs and Pollution Control Boards. Effective implementation therefore requires technical expertise, time, coordination and careful scrutiny of documents. In practice, large numbers of proposals, limited capacity, and the technical complexity of energy infrastructure can place pressure on these institutions. This may reduce the depth of review and make the process more dependent on the material submitted by project proponents themselves

7. Lack of Early Integration into Project Planning:

The fact that EIA is frequently viewed as a step to be finished after a project has been largely defined rather than as a tool that should influence the project from the start presents another difficulty. Changing the location, design, or scale becomes more difficult when environmental issues are taken into account too late. This is a significant issue in energy projects as decisions about transmission arrangement, water supply, land usage, and siting are frequently environmentally critical.

8. Inadequate Consideration of Social and Livelihood Impacts:

Energy projects often affect more than the physical environment. They may also alter access to land, forests, water resources and traditional means of livelihood. Yet social impacts are not

always examined with the same seriousness as technical environmental parameters. This weakens the broader purpose of EIA, especially where local communities bear the long-term burden of development.

9. Limited Integration of Climate Concerns:

In the energy sector, EIA must increasingly account not only for local environmental effects but also for climate-related concerns. This includes both the climate implications of conventional energy projects and the site-specific ecological impacts of renewable energy projects. Where climate concerns are treated narrowly or selectively, the assessment may fail to capture the full environmental context of energy development.

Thus, the challenges in implementing EIA for energy projects are not limited to the wording of the law itself. They arise mainly from weak report quality, inadequate data, limited participation, poor cumulative assessment, weak monitoring, institutional constraints and insufficient integration of social and climate concerns. These problems reduce the ability of EIA to function as a meaningful safeguard and raise doubts about whether environmental clearance is always operating as a serious regulatory filter rather than a procedural formality.

EFFECTIVENESS OF EIA IN REGULATING ENERGY PROJECTS:

The existence of a formal approach alone cannot be used to evaluate the efficacy of Environmental Impact Assessment in controlling energy projects. It must be evaluated by determining if the procedure genuinely affects project design, enhances decision-making, lessens environmental damage, and guarantees responsibility following approval. A formal framework for prior environmental clearance through screening, scoping, public engagement, and evaluation is provided in India under the EIA Notification, 2006. Compliance duties follow approval. This demonstrates that EIA is meant to function as an ongoing regulatory mechanism in addition to a pre-approval procedure.

1. Effectiveness as a preventive legal tool

One of the strongest aspects of EIA is its preventive character. It requires environmental consequences to be assessed before a project begins, which is especially important in the energy sector where environmental harm may be large-scale and difficult to reverse. The Supreme Court's decision in *Alembic Pharmaceuticals Ltd. v. Rohit Prajapati* is important in this respect because it rejected ex post facto environmental clearance as being contrary to the basic logic of the EIA framework. This supports the view that EIA is effective, at least in principle, because it brings environmental scrutiny into the decision-making process before irreversible project activity takes place.

2. Effectiveness in structuring project approval

Another way the EIA works is by establishing a structure that is required for project approval. Many energy projects require evaluation of the environmental effects, consideration of mitigation strategies, and assessment by the relevant expert body in order to be approved. This guarantees that environmental concerns are included in the official decision record and lessens the likelihood of simply administrative or economically motivated approval. Because it forces authorities and project proponents to address environmental issues prior to approval, EIA has actual regulatory significance.

3. Effectiveness in identifying impacts and mitigation measures

EIA's capacity to anticipate potential effects and provide mitigation strategies through the Environmental Management Plan is another significant capability. Because it asks not only if a project may progress but also under what environmental circumstances it may do so, this offers the procedure real relevance. The case study by A.K.A. Rathi demonstrates how the strength and calibre of environmental management initiatives have a significant impact on the usefulness of EIA. To put it another way, EIA can only effectively regulate energy projects if mitigation and monitoring are planned carefully and are not considered standard project documents.

4. Effectiveness in promoting public participation

EIA is further effective to the extent that it opens a formal space for public participation. Affected communities and other stakeholders can voice environmental and social concerns about the project through public consultation. This is particularly crucial in the energy industry, as people may experience ecological damage, pollution, loss of livelihood, or migration. The scholarly literature does, however, also demonstrate that its efficacy is restricted in real-world situations. According to Rathoure's analysis of the Indian EIA process, public involvement frequently stays more procedural than substantive. This implies that although the framework acknowledges consultation, its impact on actual results may be minimal.

5. Effectiveness in post-clearance regulation

The approval stage is not where EIA's efficacy ends. The Indian system incorporates postclearance monitoring within the regulatory framework and mandates six-monthly compliance reporting. This demonstrates that during building and operation, when numerous environmental hazards really occur, EIA is meant to stay relevant. However, this is also the point at which efficacy becomes inconsistent. The legal framework is in place, but whether or not compliance requirements are really observed and upheld will determine how well it works in practice. Rathi's work highlights the shortcomings of environmental management and follow-up procedures in projects that have been cleared, demonstrating that post-clearance regulation is still one of the less effective elements of EIA in actuality.

6. Effectiveness in different categories of energy projects

The type of energy project in question also affects how successful an EIA is. EIA is crucial for traditional projects like hydropower and thermal generation because of obvious concerns including pollution, forest loss, changed river systems, and relocation. Effectiveness is more complicated with renewable energy initiatives. According to Larsen's research, renewable energy EIAs frequently highlight climatic advantages while possibly paying less attention to indirect or negative environmental repercussions. This means that EIA remains necessary even for projects that are promoted as environmentally beneficial, and its effectiveness depends on whether the assessment remains balanced rather than onesided.

All things considered, EIA is a crucial and essential instrument for controlling energy projects, and it works well in a number of ways. It acknowledges public input, establishes a formal decision-making framework, allows for mitigation planning, and incorporates environmental considerations into project approval. It is still only partially successful, though. Its performance is nevertheless hampered by the disconnect between formal framework and real-world

application, particularly when it comes to report quality, public involvement, and postclearance enforcement. As a result, EIA may be characterized as a useful regulatory tool whose efficacy in the energy industry is genuine, but variable and contingent on how seriously it is applied.

SUGGESTIONS AND REFORMS:

The flaws in EIA implementation for energy projects do not prove that the framework is unnecessary. Instead, they demonstrate that the framework has to be implemented with more institutional responsibility, technical depth, and seriousness. Reforms should concentrate on making the EIA process more dependable before to clearing and more enforceable following permission because energy projects frequently include significant ecological change, displacement, pollution, and long-term resource usage. The structure for such regulation is already provided by the legislative framework, but how well the system is implemented in reality will determine how successful it is.

1. Improvement in the quality of EIA reports:

The quality of EIA reports itself is a key topic for reform. The project-specific analysis of baseline conditions, effects, mitigation, and monitoring is required by the official Terms of Reference, demonstrating that the law demands more than a standard descriptive document. Therefore, in practice, a closer examination of report quality is required to ensure that evaluations are grounded in trustworthy, scientifically supported information rather than generalizations or repetitions. This is particularly crucial for

energy projects since their consequences on the environment are sometimes complicated and long-lasting.

2. Stronger baseline data and field-based assessment:

A reliable effect evaluation starts with baseline data. For air, water, land, and other vital components, the ToR architecture specifically calls for environmental baseline data. Inadequate data can skew effect predictions from the start. Therefore, reform is required in the form of improved field research, updated data, and more thorough site condition verification prior to project evaluation.

3. More meaningful public consultation:

Public input need to be considered more than just a formality in the decision-making process. Affected parties and other stakeholders are formally included in the process through the EIA Notification, and issues brought up during consultation are anticipated to be addressed in the final EIA. However, the scholarly material you submitted demonstrates that public participation in India is frequently delayed, constrained, and has little practical impact. Therefore, improved project information availability, early consultation, and more open handling of community complaints should be the goals of reform.

4. Greater use of cumulative impact assessment:

Energy projects shouldn't always be evaluated separately. The MoEFCC-sponsored hydropower basin studies show that several projects in the same biological region might have compounded impacts that a project-by-project evaluation would overlook, and the official ToR itself acknowledges cumulative effects. Reform should therefore shift toward more robust

cumulative and regional evaluation, particularly in river-valley, thermal, and mining-related energy development.

5. Stronger post-clearance monitoring and compliance:

The approval should not be the end of the EIA procedure. Six-monthly compliance reporting is incorporated into the regime, according to official documents and the Parivesh compliance system. This indicates that environmental regulation is intended to continue throughout the project's operational period. Stricter evaluation of compliance reports, improved public access to those reports, and more robust enforcement in cases when clearance requirements are disregarded are all necessary reforms to increase the credibility of this follow-up.

6. Better technical capacity and consultant accountability:

The system depends heavily on the technical quality of consultants and appraisal bodies. The QCI/NABET certification program demonstrates that formal quality standards must be met by EIA consultants; nevertheless, accreditation by itself cannot guarantee accurate evaluation unless appraisal authority have adequate technical resources and review time. Therefore, reform should concentrate on both sides: boosting the institutional capacity of the authorities that assess consultant organizations' work and enhancing their competence and responsibility.

7. Earlier environmental scrutiny in project planning:

An essential reform element is highlighted by the Supreme Court's rejection of regular ex post facto environmental clearance: environmental review must precede final project decisions. Early integration of EIA is more beneficial than treating it as a later approval barrier in the energy industry, where site selection, water use, transmission layout, and resource extraction patterns are frequently ecologically critical.

8. Better integration of climate and social concerns:

Concerns of livelihood and climate change must also be addressed in a contemporary EIA framework for energy projects. A.K.A. Rathi's Indian case study is especially relevant here because it shows that the practical value of EIA depends heavily on the quality and robustness of environmental management programmes. In addition, Indian EIA literature emphasizes the importance of paying more attention to stakeholder concerns and societal ramifications. Therefore, reforms should promote a more comprehensive evaluation that takes into account long-term socioeconomic impacts on impacted populations, indirect ecological effects, and climate resilience. In sum, the reform of EIA for energy projects should not be understood as the replacement of the current framework, but as its strengthening through better evidence, stronger participation, cumulative assessment, post-clearance enforcement and higher institutional capacity. If these areas are improved, EIA can operate more effectively as a serious regulatory tool rather than merely as a formal stage in project approval.

CONCLUSION:

In conclusion, environmental impact assessments continue to be a crucial legal instrument in the regulation of energy projects since they allow for public input, bring environmental scrutiny prior to project approval, and establish a foundation for mitigation and post-clearance compliance. However, the study also demonstrates that its efficacy varies among energy projects and is frequently undermined in reality by subpar reporting, inadequate baseline data,

low public engagement, insufficient cumulative evaluation, and inadequate post-clearance monitoring. Therefore, even though the Indian EIA framework may theoretically balance environmental protection with energy development, its actual performance is still inconsistent and incomplete. As a result, the research finds that while EIA is essential, it is not entirely successful in its current form. Its worth is found in making sure that decisions are transparent, responsible, and well-informed rather than just in giving clearance. Stronger compliance procedures, institutional capability, meaningful engagement, and scientific rigor must all be prioritized if EIA is to regulate energy projects more successfully.

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