



Jus Corpus Law Journal

Open Access Law Journal – Copyright © 2025 – ISSN 2582-7820

Editor-in-Chief – Prof. (Dr.) Rhishikesh Dave; Publisher – Ayush Pandey

This is an Open Access article distributed under the terms of the Creative Commons Attribution-Non-Commercial-Share Alike 4.0 International (CC-BY-NC-SA 4.0) License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium provided the original work is properly cited.

Interpretation of Environmental Impact Assessment Laws in India

Juhi^a

^aSymbiosis Law School, Hyderabad, India

Received 09 December 2024; Accepted 10 January 2025; Published 13 January 2025

At a point in time, this set of regulations for EIA in India constituted the very backbone of environmental protection. Still, they are fighting a losing battle to adjust to the gigantic pace of industrialization, urban expansion, and growing complexities of climate challenges. Analyzing some gap areas in the current scheme includes insufficient public engagement, ineffective compliance mechanisms, and a scant consideration of cumulative impacts. This research would explore how artificial intelligence, blockchain, and geospatial tools may present new opportunities for greater precision and increased accountability in EIA processes. Learning the global best frameworks for EIA from Sweden, Japan, China, and Thailand shall provide practices and solutions that could be adapted within the Indian context. The study accentuates an essential aspect of projecting climate risk management within EIA for more proactive mechanisms to tackle environmental hazards. This research aspires to transform EIA into a dynamic growth and disposition framework that marries developmental interests with sustainable management of the environment.

Keywords: *environmental impact assessment, India, emerging technologies, public engagement, climate adaptation.*

INTRODUCTION

Environmental Impact Assessment (EIA) regulations once served as India's robust environmental protective framework. However, given the rapidity with which the world is changing--factories are proliferating, cities are expanding, and weather trends are increasingly erratic--these regulations now seem somewhat outdated. We are left to wonder if they have sufficient power to protect them. It is becoming increasingly clear that our approach to environmental protection has lagged behind the pace of urbanization and industrialization. On too many occasions, India's EIA regulations do not strike an adequate balance between development and safety. Project approval occurs, damage is inflicted, and only after we realize what we have damaged or lost too late.¹

This study will go beyond examining the literature. We are going to dive more deeply into the surface question. What are we not seeing? What does this process miss? How do we start to engage with these newly acquired tools? To stop reacting to damage and step into an anticipatory space: using AI, data, and technology? Bear in mind that the people who live in the places where these projects are being destroyed are the ones who will be most affected.²

However, as environmental concerns have become global, existing methods to assess impact in India are lagging. Public meetings will be passed through motions, companies will check the box to show compliance, and enforcement will be lacking.³

EIA goals highlight where potential environmental problems may arise with a project, estimate the possible severity of those impacts, and recommend solutions to those problems. It is akin to predicting potential problems and preparing a plan to abate or eliminate those potential problems.

¹ Kultip Suwanteep et. al., 'Environmental Impact Assessment System in Thailand and Its Comparison with Those in China and Japan' (2016) 58 *Environmental Impact Assessment Review* <<https://doi.org/10.1016/j.eiar.2016.02.001>> accessed 13 September 2024

² Rachna Bhatia et. al., *Environmental Impact Assessment: A Journey to Sustainable Development* (Springer Nature 2024)

³ Sairam Bhat, *Environmental Law, and Governance in India* (1st edn, Routledge 2024)

Problem Identification: We want to ascertain the anticipated impact on human health, animal species, water, and the air.

Estimating Their Potential Severity: We must estimate the potential harm the endeavour may bring.⁴

Determine Whether It Is a Significant Issue: We must balance the issues against what the context will allow. Identify solutions: We need to think about how to modify the project to either be decorative or at least not generate emblems. The project will be required to re-evaluate its process at least to justify its development.⁵

This research examines more than just rephrasing our standard definition of E.I.A. We will examine intractable issues surrounding gaps and undiscovered risks about how emerging technologies like blockchain and artificial intelligence could influence environmental legislation in India. With these fabulous new technologies, why are we still doing E.I.A's in the old-fashioned way? How do we cure the projects' cumulative impact-sensitive areas? Finally, how do vulnerable populations that are already marginal in this burgeoning field respond to opportunities?

We are here to expose latent challenges in environmental impact EIA legislation and suggest solutions. We will examine our choices to understand better what emerging concepts and technologies not yet applied to environmental impact assessments (EIA) contribute to environmental protection. Our aim is not simply to assess the EIA and where it is now but to start a discussion of the EIA and where it is going. And the issues and offer aspirational forward-looking proposals.⁶

HISTORICAL BACKGROUND (INDIA)

There has been considerable research on the changes that the 1986 Act placed on India's EIA process. Many scholars state this act laid the foundation for environmental law in India, which

⁴ Bhateria (n 2)

⁵ *Ibid*

⁶ John Glasson and Richard Therivel, *Introduction to Environmental Impact Assessment* (4th edn, Routledge 2012)

primarily focused on developing generalized guidelines for ecological conservation. When the Planning Commission realized that projects based around river valleys necessitated checking for environmental effects, EIAs began to be implemented in India during the 1970s. This focus started with assessing projects concerning infrastructure and gradually began to include various other forms of improvements. The Environmental (Protection) Act 1986 was a landmark legislation in the field of EIA.⁷

The passing of the Environmental (Protection) Act in 1986 was a significant turning point in India's history of assessing and evaluating environmental impacts under the law. This law laid the foundation for EIA laws and provided the legal framework for environmental governance. The EIA Notification 1994 was another central turning point in the evolution of EIA in India. It classified objects based on their assessed environmental impact potential and formally required on an identified project list to secure environmental clearance. While the 1994 Notification was a significant leap forward, it has been critiqued for its regulatory process and finding that there was little public involvement. The EIA Notification of 2006 resulted in considerable evolution, including the delegation of decision outcomes to state governments for certain classes of projects for expediency, resulting in concerns about potential irregularities with enforcement and the break-up of larger projects. Low public participation has proven to be a consistent challenge in India's implementation and practice of EIA. The EIA process has public consultation. However, the efficacy of these consultations is challenged by low levels of transparency and project proponent power. Another persistent concern has been compliance with EIA regulations.⁸ Project proponents need to adhere to the EIA process for adequate environmental protection and require risk assessment and effective mitigation measures at the outset of the EIA process. It has been a significant concern despite enforcement practice, which results in a lack of compliance and adequate oversight. The implementation of EIA is complicated, with overlapping jurisdiction for various government agencies, particularly at the state and federal levels. This is an increasingly pressing issue in coastal locations where EIA obligations compete with Coast Regulation Zone (CRZ) rules for jurisdiction. To further complicate issues around

⁷ *Ibid*

⁸ Rhuks Ako, *Environmental Justice in Developing Countries: Perspectives from Africa and Asia-Pacific* (1st edn, Routledge 2013)

EIA, new environmental concerns are changing the framework of EIA. The world is changing regarding ecological problems, including new environmental challenges like climate change and diversity loss. There is a shift in the planet that carries new environmental challenges that require an abundant and flexible approach to EIA.⁹

INTERNATIONAL COMPARISONS OF FRAMEWORK

Global Environmental Impact Assessment (EIA) systems can be widely different and adaptable to each country's distinctive needs and conditions. Here is an appraisal of the pros and cons of the EIA frameworks in Sweden, Pakistan, Thailand, China, and Japan.

Sweden was one of the first countries to accept EIA, with formal evaluations beginning in 1988 with the enactment of the Environmental Government Bill. Sweden's comprehensive framework enables environmental considerations to be easily incorporated into decision-making. The EIA framework in Sweden is very structured and helpful, even with the pervasive difficulties of accommodating new ecological issues and sufficiently responding to public concerns.

In **Pakistan**, EIA was mandatory with the Environmental Protection Act of 1997. Pakistan has systemic implementation complications with EIA despite its late initiation. Limitations of monitoring, muddled integration into project phases, and limited resources are the key issues contributing to EIA's ineffectiveness in Pakistan. This potentiality illustrates the variance of policy and practice for developing nations.

Thailand established its EIA system in 1978, with amendments in 1992 per the National Environmental Quality Act (NEQA). Thailand's system is differentiated since it considers impacts on human health and the environment. However, Thailand encounters issues of limited public engagement and evaluation of alternatives. Overall, Thailand requires substantial adaptations to be effective, particularly components to increase the role of local authorities.

As of the enactment of the Environmental Protection Law in 1979, **China** began administering EIAs, and as an EIA Licensing System in 1986, codified the process. Despite being richly varied

⁹ 'Understanding EIA' (*Centre for Science and Environment*) <<https://www.cseindia.org/understanding-eia-383>> accessed 13 September 2024

in ways of conducting EIAs according to different contexts¹⁰, challenges for China consist of but are not limited to, variation in the application of EIA results and public involvement. Again, those issues highlight broader issues of institutions and governance.¹¹

Japan has a robust system embedded in its environmental governance framework. The 1972 EIA built in Japan underwent a major revision in 1997. While Japan has a sophisticated system, it needs to streamline some of its processes and do a better job at public engagement. Japan's EIA system must evolve to remain responsive and effective, even with an advanced framework.¹²

In summary, the EIA frameworks of China, Japan, Thailand, Pakistan, Sweden, and others demonstrate various processes and challenges. Developing (or emerging) countries like Pakistan and Thailand face significant challenges, while advanced countries like Sweden and Japan benefit from well-integrated established institutions. Though China has a comprehensive framework and the components of an effective and fair EIA system, the government struggles to implement these components. Unpacking these variations underscores the importance of adaptive EIA processes that aim to create more frameworks that usher in sustainable development.

CRITICAL ANALYSIS

Challenges in Implementing the Process in India - In recent years, there have been a lot of problems regarding how companies get permission to do things that could eventually harm the environment. Some people think that the government is letting companies do things that are bad for the environment for the sake of money or economic growth. But companies and some government officials think the rules are slowing down India's progress.

1. Weak Regulatory Assessment: One of the most alarming and sobering examples of the fallout from insufficient environmental control and the pressing need for a strong EIA framework in which the government was involved was the 1984 **Bhopal Gas Disaster**. This tragic incident,

¹⁰ Carlos Wing-Hung Lo and Shui-Yan Tang *Institutions, Regulatory Styles, Society and Environmental Governance in China* (1st edn, Routledge 2013)

¹¹ Glasson (n 6)

¹² Suwanteep (n 1)

recognized by many as the most significant industrial disaster in history, revealed severe flaws in India's EIA system.

The accident caused the Union Carbide factory in Bhopal to be heavily populated, with many residential neighbourhoods, schools, and commercial organizations nearby. Despite these considerations, the facility was authorized without comprehensively evaluating its possible environmental concerns. Due to this error, a chain of events resulted in the hazardous methyl isocyanate (MIC) gas leak, which caused the deaths of thousands of people and caused chaos in the environment and public health.

The Bhopal Gas Disaster brought to light several significant shortcomings in the EIA procedure at the time:

- **Insufficient Risk Charge:** The Union Carbide plant's first environmental assessment did not identify the potential dangers of handling and storing hazardous solid chemicals.
- **Inadequate Public Involvement:** This resulted in a lack of knowledge and readiness for possible emergencies, as the local community was not sufficiently involved in the decision-making process regarding the site and operation of¹³ the plant.¹⁴
- **Feeble Implementation:** The factory was able to operate with safety flaws because the regulatory authorities were unable to oversee and enforce environmental requirements effectively.¹⁵

The Bhopal Gas Disaster caused India's attitude to environmental control to change significantly. It forced the government to tighten project approval procedures and reinforce the EIA framework. There have been notable improvements in the nations since 1994 and 2006 notifications. However, even with these advancements, there are still issues with EIA

¹³ Barry Dalal-Clayton and Brenda Sadler, *Sustainability Appraisal: A Sourcebook and Reference Guide to International Experience* (1st edn, Routledge 2014)

¹⁴ Anil Kumar Gupta et.al., *Disaster Risk and Management Under Climate Change: Disaster Resilience and Green Growth* (Springer Singapore 2024)

¹⁵ Mahesh R Sharanappa, *Laws Relating to Environmental Impact Assessment: Current Status and A Way Forward* (Codex International Publishers 2022)

implementation in India. Weak public participation, limited transparency, and enforcement issues will inhibit the system from functioning effectively.

The Bhopal Gas Disaster is an unfortunate reminder of how vital a strong EIA system is to prevent further disasters in the future. If India confronts prior mistakes and applies sound practices, it can guarantee its development will occur in a manner that aligns with environmental sustainability and human well-being.

2. Lack of Adequate Risk Assessment: When discussing mineral extractions and uranium mining in India, a profound conflict arises between advancing economic development and its associated ecological and social damage. The proposed uranium mining activities in the **Nallamala Forest Reserve** and **Amrabad Tiger Reserve** are an extreme example of how pale the risk assessment process in Uganda is for these assessments associated with environmental degradation and the social impacts on local people before pursuing these mining activities - including for the Chenchu tribe who represent the Indigenous people and their land.

The ecological risks from uranium mining are significant. Mining – through drilling, blasting, and digging – produces hazardous waste in the form of radioactive tailings, and disposing of these tailings properly will create environmental damage and, in some cases, health burdens over an extended period.

In an ecologically sensitive location like Nallamala, the risk of groundwater contamination from radiation is a serious concern. Furthermore, air quality declines as a result of deleterious particles. However, these dangers are commonly dismissed or are not sufficiently managed in the assessment stages of the process.

Risk, of course, is not limited to the environmental impacts of mining but also relates to the potential disruption of biodiversity. The impacts destabilize and disrupt habitats, especially the Nallamala homes of the Bengal Tiger. Clearing large tracts of forest disrupts ecosystems, and the ecosystems become isolated, smaller, and eventually extinct.

The impacts are aggravated by vibrations/noise produced during the extraction process. The disruptions affect wildlife and their instinctual mechanism. Underestimating risk impacts around extraction processes only reflects the environmental impact assessment gaps.

Socially, risk is rarely explored in terms of deeper ethical and cultural values and relevance to mining. The forest and geographical area are more than 'land'; they are essential to Chenchu tribes and their traditional means of living. Uranium mining threatens their livelihood and culture, but it adds social risks.

In a larger social context, the risks associated with mining are seldom connected to purgatorial and genuine implications. For the Chenchus tribal people, their forests are much more than just habitat; they are part of their traditional means of survival. Effectively, uranium mining jeopardizes their means of economic survival and their culture. In particular, the social risks associated with inadequate rehabilitation policies or psychological distress resulting from dispossession tend to be rationalized and dismissed in the risk assessment process. As the demand for nuclear energy increases, the perceived failure to adequately assess and manage social risks raises a serious question about the sustainability of uranium mining projects. Absent a detailed analysis of risks and their implications, the justification for such projects has significantly reduced, which has led to massive environmental damages and social inequity.¹⁶

3. Limited Public Participation: Projects for development (such as infrastructure projects, roads, dams, and mining) create positive economic change; however, they frequently cause significant environmental and social damage.

THE DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) NOTIFICATION OF 2020, released by the Indian government, has been criticized for restructuring the public participation guarantee. For example, several types of projects are exempt from instituting the EIA process altogether, public consultation periods are curtailed in terms of time, and interested community stakeholders lack access to complete information, making it difficult to engage effectively and

¹⁶ Ravindranath Chowdary Namburu and Mani Deepika PS, 'Is Environmental Degradation Worth A Cause For Uranium Extraction' (2024) 4(1) Nyaayshastra Law Review <https://94ee8b88-9ce0-4866-a7e6-564fad3575e4.usrfiles.com/ugd/94ee8b_d47ce2239ccf47c495c41ce8c8715390.pdf> accessed 13 September 2024

voice concerns. Countries such as Canada emphasize the ability to engage stakeholders early and adequately in the EIA process. Transparent public consultations, on their part, help balance the economic benefits with the social, environmental, and health impacts of development projects. This approach helps build trust between developers, regulators, and local communities to ensure the projects are more sustainable.¹⁷

In contrast, India's draft EIA Notification significantly decreases meaningful public involvement opportunities for smaller or expansion projects. The shortening of the consultation period and the reduction in the number of public hearings undermine the accountability of the developers of projects.

For sustainability and development to be mutually inclusive, India must reconsider public participation models in the EIA process. Public participation ensures that development projects can occur without access to environmental benefits and protective principles on the social spectrum. For long-term development and growth to be truly inclusive, we must also include global extraction of community voice participation in the EIA process.¹⁸

EIA RESEARCH GAPS - INDIAN ENVIRONMENTAL LEGISLATION

Climate Risk Management and Its Impacts on Development: Extreme weather patterns have happened more frequently, and their severity has increased, along with slowly occurring or emergent changes in climate. The urgent need to develop climate risk management options has indeed been forecast. Most recently, in the field of climate science, the consequence of climate extension should be mentioned - that climate change is a top threat to sustainable global development. To counter such threats requires more than adaptation and mitigation; it also requires designing strategies to deal with the inevitable losses and damages, as defined by the UNFCCC's framework of Loss and Damage (L&D).

¹⁷ *Ibid*

¹⁸ Rajesh Chadha and Ganesh Sivamani, 'India Needs to Strengthen, Not Dilute, Environmental Assessments' (Centre for Social and Economic Progress, 07 September 2020) <<https://csep.org/blog/india-needs-to-strengthen-not-dilute-environmental-assessments/>> accessed 13 September 2024

In response to these challenges, the German Federal Ministry for Economic Cooperation and Development has recently launched a global program implemented with Deutsche Gesellschaft für Internationale Zusammenarbeit, GIZ. In cooperation with partners like KPMG India and IIASA, it aims to develop a Climate Risk Management (CRM) framework.¹⁹ It was mainly motivated by assessing and reducing significant climate-related vulnerabilities and residual risks through DRR, together with considering climate adaptation in the effective management of loss and damage.²⁰

Given that the report of GAR 2019 reveals the damage increased due to extreme events compounded by unsustainable practices and focus on monoculture that amplifies the damage, it draws attention to the need for a holistic integration of climate initiatives with disaster risk reduction measures as part of attaining SDGs. The National Action Plan on Climate Change, the Disaster Management Act of India, can separately address climate and disaster risk management issues.²¹ However, the urgency remains to integrate these efforts into a combined framework encompassing climate resilience and disaster risk management.²²

How have Digital Tools Like GIS and Remote Sensing Been Integrated into EIA in India:

Geospatial technology is used in the EIA process because changes in environmental resources often depend on changes in the landscape regarding proposed projects. The EIA process has significantly improved visualization, movement tracking, data querying, and mapping functionalities through instruments such as remote sensing, GIS, and GPS. However, the most significant challenge is the availability of the most updated and accurate interpretations of geospatial data.

This paper explores how geospatial tools enhance environmental monitoring and support and facilitate the analysis of natural resources for planning development, policy-making, and decision-making.²³ Within the Indian context, these tools have been utilized in monitoring air

¹⁹ Philippe Cullet et. al., *Water Law for the Twenty-First Century: National and International Aspects of Water Law Reform in India* (1st edn, Routledge 2009)

²⁰ *Ibid*

²¹ Usha Tandon et.al., *Biodiversity: Law, Policy, and Governance* (1st edn, Routledge India)

²² *Ibid*

²³ K. M. Baharul Islam et. al., *Environment Impact Assessment: Precept & Practice* (1st edn, CRC Press)

and water quality, ground-level ozone tracking and soil erosion measurement, studying sea-level rise from global warming, and demarcation of ecologically sensitive areas through digital-image analysis and GIS.²⁴ This study would provide better uploading, assessment, maintenance, and reporting in different formats by suggesting a spatial decision-support system for EIA.²⁵

Examining AI's Potential Contributions to Environmental Impact Assessments AI's Enhanced Data Analytical Abilities:²⁶

- **Satellite Imagery:** A high-resolution satellite image can be analyzed by AI to understand changes in land cover, deforestation, and loss of habitat over time.²⁷
- **Remote Sensing:** An AI application can employ various remote sensing technologies—drones and LiDAR—to process data for 3D models of the landscape in question and either inform decisions or evaluate risks.²⁸
- **Historical Data:** AI can process vast amounts of historical environmental data to reveal trends, correlations, and patterns that humans cannot quickly do.²⁹
- **Scenario Analysis:** AI can run simulations of various scenarios that take into account weather-related factors, different designs, etc., to examine the impacts on the environment.
- **Climate Change Modeling:** AI can incorporate climate change projections into the EIA model to assess the long-term impact of climate change both at the initial assessment phase and into the future.
- **Ecosystem Modeling:** AI can build ecosystem models that explore biodiversity, fragmentation, habitats, and ecosystem functioning and services impacts, providing a comprehensive model for project decision-making.

²⁴ D R Satapathy et. al., 'Application of Geospatial Technologies for Environmental Impact Assessment: An Indian Scenario' (2008) 29(2) International Journal of Remote Sensing <<https://doi.org/10.1080/01431160701269002>> accessed 16 December 2024

²⁵ *Ibid*

²⁶ *Ibid*

²⁷ Nizami Abdul-Sattar, *Comparative Analysis of the EIA System of Developed and Developing Countries: Cases of Hydroelectric Power Plants* (2007).

²⁸ Massimo Regona et. al., 'Artificial intelligence and sustainable development goals: Systematic literature review of the construction industry' (2024) 108 Sustainable Cities and Society <<https://www.sciencedirect.com/science/article/pii/S2210670724003251>> accessed 16 December 2024

²⁹ *Ibid*

- **Sensor Networks:** AI can harness data from various sensor networks to aid in monitoring factors such as air quality, noise, and water quality inputs into EIA models that evaluate environmental conditions.
- **Predictive Maintenance:** AI can utilize predictive analytics to predict equipment failure in environmental monitoring systems, enabling preventative maintenance and data accuracy.
- **Multi-Criteria Analysis:** AI can utilize data analyzing multiple criteria, including environmental impacts, economic viability, and cultural implications, in any decision-making or EIA process.
- **Risk Assessment:** AI has the potential to do risk assessment modelling—identifying impacts and evaluating vulnerabilities to identify risks and proactively mitigate impacts.
- **Optimization:** AI has the potential to optimize the initial design or mitigation strategies to minimize environmental impacts and meet project objectives.

Future Directions -

- **Integration with Other Technologies:** With the application of AI in other technologies, like the Internet of Things or blockchain, there is additional value and enhancement for applications of EIAs.
- **Regulator Frameworks:** Applications in EIAs will create a more ethical and responsible application of AI. By addressing these challenges, India can significantly improve the quality and efficiency of EIAs to support sustainable development and environmental management.
- **Citizen Science:** AI can be used to assess citizen science data, which provides tremendous insight into environmental issues.

TIGHTROPE WALK ON INDIA'S EIA: STREAMLINING THE PROCESS VERSUS SCRUTINIZING IT

India's recent environmental impact assessment (EIA) changes have encouraged active debate. The reform entered the fold of fast-tracking project approval - the concern among critics is that it bypasses environmental protection criteria.

Concerns -

Less Scrutiny: There are (potentially) more projects than ever that no longer require full EIAs, an apprehension that more infrastructure and industrial projects that could be risky would slip through a lack of scrutiny.

Silenced Voices: Eliminating opportunities for public participation limits the ability of citizens to raise objections and hold public or private projects accountable, causing a loss of transparency and democratic participation.

Ex-post Facto: The introduction of 'ex post facto' or backward approval would mean a project could receive approval after its construction began without room to assess the project through an environmental lens.

Decreased Access to Expertise: Less use of expert panels means a less rigorous review of a project's Technical Capability of the Company.³⁰

Proponents -

Supporters of streamlined project approval contend that this regulation is needed to streamline the EIA system to avoid unnecessary delays and development stoppage. Most agree there can be a balance between allowing environmental regulations and ensuring access to the public planning process without significantly impacting necessary protections for the person and ecological system.

It would be premature until we see the EIA guidance in practice to note how much worse it is now than before. Some say less scrutiny means higher environmental disclosure and accountability; others articulated that the effect is negligible. An inflexible approach would increase the risk to the ecological systems and those the systems benefit from.

³⁰ G Seetharaman, 'Govt Walking Tightrope Between Environment Protection & Need to Attract Investments' *The Economic Times* (22 September 2013) <<https://economictimes.indiatimes.com/news/economy/finance/govt-walking-tightrope-between-environment-protection-need-to-attract-investments/articleshow/22865064.cms?from=mdr>> accessed 16 December 2024

India must continue to walk the tightrope of finding ways to accommodate project approval while ensuring environmental safeguards. These might include:

- **Clarity without Mystery:** Provide explicit exemptions based on project risk assessment to ensure low-risk projects can access rigorous scrutiny.
- **Seriously Impede Public Participation:** Provide a channel for public input while considering the issues raised through public participation regardless of whether they were welcome and evaluate this feedback.

By finding this balance, India can ensure sustainable development that protects its environment while fostering economic growth for its citizens.

ENVIRONMENTAL JUSTICE AND THE EIA PROCESS IN INDIA

Despite the EIA process in India working to consider the potential environmental effects of proposed projects, whether the EIA process can effectively address issues related to environmental justice, especially for marginalized and disadvantaged communities, remains to be seen. As part of the EIA process, there is a public consultation and a participation requirement, which may pave the way to ensure better opportunities for marginalized and disadvantaged communities to participate.³¹ However, multiple issues may limit the success of this process on environmental justice issues, including:

- **Limited Access to Information:** Marginalized communities have limited access to information regarding proposed projects and the EIA process. This limitation restricts their ability to engage in meaningful participation.
- **Language Barriers** - Project developers and marginalized communities may not have a common language, restricting communication and presenting concerns.
- **Lack of Capacity** - These communities do not have the resources and capacity to engage in the EIA process effectively, provide for experts, or self-organize their community.

³¹ Tokunbo Alaga Olorundami, 'Environmental Impact Assessment (EIA) Effectiveness and "Local Context": The Case of Nigeria' (D'Phil Theses, Newcastle University 2021)

- **Power Imbalances** - Project developers and marginalized communities often have significant power differences, which impact decision-making processes and the ability of communities to negotiate equitable outcomes.

GAPS IN ACHIEVING EQUITABLE CONSIDERATION

In addition to deficiencies experienced by communities, there are significant gaps in the existing EIA process to address environmental justice issues:

Cumulative Impacts of Projects: EIA processes usually focus on the direct impacts of individual project proposals; cumulative impacts from multiple projects, particularly in marginalized communities, disproportionately impact these communities.

Enforcement of Provided Considerations for Marginalized Communities: Even if considerations are included in the EIA process and an approach for enforcement is put in place, once an impact occurs to communities, the enforcement mechanisms rest with the discretion of authorities to be interpreters of the process and with project developer compliance.

Accountability: Developments and governmental project developers may fail to be accountable, leading to further environmental injustices impacting marginalized community rights and conditions.³²

Several strategies can be adopted to foster the appropriate incorporation of environmental justice factors into the EIA process:

Public Participation: These efforts can include active outreach to promote public participation in the EIA process, including marginalized and disadvantaged communities, through translation into local languages or incentives to attend meetings, such as for transportation or babysitting.

³² Ishita Garg, 'Environment Impact Assessment: India needs to revamp its public consultation framework' (*Down to Earth*, 23 February 2021) <<https://www.downtoearth.org.in/governance/environment-impact-assessment-india-needs-to-revamp-its-public-consultation-framework-75630>> accessed 16 December 2024

Cumulative Impacts: Therefore, assessing the cumulative impacts of multiple projects would be valuable in understanding how proposed developments could affect marginalized and disadvantaged communities.

Community-Based Monitoring: Finally, as community-based monitoring and data collection activities emerge, marginalized and disadvantaged communities can have a stronger voice in decision-making and future action capabilities.

By reasonably incorporating these solutions and determining pathways for an environmental justice approach to the EIA process, India can ensure the EIA process will protect ALL communities, irrespective of socio-economic standing.

CASE STUDY - A MILESTONE IN ENVIRONMENTAL LAW

The Shriram Oleum Gas Leak Case, also called *M.C. Mehta v Union of India*, has an influential position in environmental law in India and is a turning point in its history. The Shriram Oleum Gas Leak incident occurred in Delhi in 1985, where the oleum gas started leaking out of a fertilizer plant. The disaster and legal engagement resulted in the demand for a more substantial operational safety and environmental assessment framework, and it served as one of the formative experiences of the Environmental Impact Assessment (EIA) law in India.³³

Context of the Case: In December of 1985, the oleum gas leaked from the Shriram Food and Fertilizers Industries fertiliser plant in Delhi, again reasserting the threats of environmentally industrial hazardous operations: flow and direct pollution to many environmental sectors in a high-density area.³⁴ The two gas leak events impacted workers, residents, and infrastructure nearby. The events resulted in calls for legal intervention to protect the environment from industrial operations and a lack of legal protections under some existing environmental statutory frameworks.³⁵

³³ Bhat (n 3)

³⁴ Olorundami (n 32)

³⁵ *M.C. Mehta v Union of India* (1986) 1 SCC 395

In the moon of oleum cases, the Supreme Court of India held the Shriram case plant had to rest and subsequently allowed the plant to reopen conditional upon improved operations. To this point, the legal determinations and cases of oleum are responsible for lining the need for rigorous assessments for even more operational assessments, as detailed gaps in safety are revealed during case matters. The oleum trial processes began scrutinizing heap levels of existing law. They fit the Catalonian effect of providing a need to deal with environmental impact assessments for operational concerns coping with managing the industrial effect of their facility and community, as a type of assessment would likely form a precursor of the evaluation to many EIA contexts.

However, the oleum masterclasses achieved the development, drafting, and evaluation of more legislation and related regulations addressing contain into stricter environmental legislation about hazardous industries - Regulations and legislation will lift the veil on the depth of more in-depth environmental dangerous sectors. The Supreme Court decision proclaimed the strong ethos of EIA law through a pronouncement of operational risk in aspects evidence-based. It restored existing operation risk levels and resulting operational systems.³⁶

Ultimately, the oleum cases validated the argument for accountability and liability as a shared aim of EIA law. However, one arises from absolute liability- that stated groups engaged in agricultural environmental hazards and exposing the neighbouring community's full accountability and presumed harm- that engages forms of reciprocity with the environment after consideration of whether and to risk society communities as a consequence of operations that create a risk to the environment needed to re-assess processes from surrounding community to developing community within the strategy of prevention as warranted.

Furthermore, in response to the notion the companies' action data did not allow them to compensate the affected community was previously one impetus for establishing the Public Liability Insurance Act (PLIA). This requires hazardous industries to buy insurance for activities that damage the environment and also provides options for financial resources to pay for

³⁶ Ishani Samajpati, 'MC Mehta v Union of India (1986): A Case Analysis' (*iPleaders*, 03 October 2022) <<https://blog.ipleaders.in/mc-mehta-vs-union-of-india-1986-case-analysis/>> accessed 16 December 2024

damages due to accidents involving industries. As such, this reflects a proactive approach to environmental risk management as another mechanism for fulfilling the purposes of EIA.

The Shriram Oleum Gas Leak case customized the development of EIA laws in India. It illustrated the need for thorough assessments, more excellent safety standards, and general risk management processes. The case presents an example of how legislation can develop due to environmental challenges, reinforcing various purposes of EIA in preventing risks to the health and safety of the public and the environment.

SUGGESTIONS

Several proactive approaches may be employed to enhance India's Environmental Impact Assessment (EIA) process. First, an opportunity is to optimize new technologies such as Artificial Intelligence (AI) and Machine Learning (ML) to improve impact predictions and accuracy in environmental assessments. Newer technologies can become even better at analyzing larger datasets, leading to improved insight into potential environmental impacts and refined mitigation approaches.³⁷

Second, community and stakeholder engagement will need enhancement. Innovative interactive platforms for public participation may lead to further transparency and inclusivity. Engaging local communities in the assessment process will help the EIA system respond to local needs, mitigate local issues, and maximize impacts for all people and stakeholders.

Finally, evolving the regulatory framework to stay current with the world, even with new environmental pressures, is necessary. Updating policies and procedures is essential, focusing mainly on integrating new technologies, tools, and methodologies; updates will continue to improve India's EIA process. This continued advancement will lead India to a better and more sustainable equilibrium between development and environmental protection.

³⁷ *Ibid*

CONCLUSION

In conclusion, while incorporating Environmental Impact Assessment (EIA) in India is vital to sustainable development, opportunities and challenges are associated with this integration. In this project, we explored some areas of EIA in India that have not received enough attention. We studied issues regarding impact assessments, significance, and mitigation measures, which require significant attention for EIA to be effective.

About identifying climate risk management, we want to emphasize the need for a stronger framework to address climate risk management for climate risks. As climate change progresses, it is unlikely that solely relying on adaptations and mitigation strategies will be enough. Therefore, the EIA process must include carefully designed climate risk assessments and management measures to better age hazards, losses, and damage to the newest tools and technologies, specifically geospatial technology (Geographic Information Systems (GIS) and remote sensing) and other emerging technological tools, can significantly improve EIA methodology's advancement, updates, and integration.

However, some issues need to be recognized and included in the final evaluation regarding the costs, uptake of data, accessibility, accuracy of data, etc. In the end, it helps, and practices that explore and help support these technologies will significantly improve the accuracy of findings and, as a result, contribute to better-informed environmental decisions.

From our conclusion, the EIA framework in India has started, especially in integrating technologies of a digital nature and addressing climate risks. Several changes need to occur, and it is still a work in progress. Once case studies are elaborated, more voices are added, comparative exercises are taking place, and policies are worked on, this project could impact EIA processes to be more integrated and, therefore, more effective overall.

This project stresses that as our environmental and development challenges evolve, the practice of EIA must be continuously improved and adapted to meet both challenges.