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**ARTICLE**

# Pursuing the Distilled Good Practices to Improve the Quality of Environmental Impact Assessment Reports and Hence Enhance the EIA Effectiveness and Help Address the Concerns of Project Proponents: An Indian Context

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## ABSTRACT

Despite a wealth of literature on the different facets of the EIA, and copious theoretical knowledge and practical experience, the general agreement is eluding definitions of EIA effectiveness, quality, and good practices. There are apprehensions about EIA meeting its basic objectives while project proponents continue to treat EIA as an impediment to development. Governments tend to adopt a "practical" approach, sacrificing pillars of EIA and overlooking the prime objective of environmental protection. Based on an extensive literature study and the author's long EIA-related experience, some key workable practices for the EIA process are elaborated. Meticulous scoping using different sets of lenses, spotlighting significant impacts to determine the breadth and depth of EIA reports for focussed EIAs, robust EIA review and decision-making, commitment from the regulators for environmental protection, and use of strategic planning, strategic environmental assessment, and tiering practices are expected to address scholars' apprehensions and project proponents' concerns.

***Keywords:*** EIA reforms; EIA regulation; EIA review; Good quality EIA report; Good practice EIA

## 1. Introduction

Environmental Impact Assessment (EIA), internationally considered a science and art [1], has grown in popularity as well as a strength [2] as one of the world's most widely used environmental policy

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instruments [3]. This is evident from its adoption in 187 countries as of 2017 [4]. As the key instrument, the *ex-ante* evaluation of the environmental aspects helps ensure that economic growth is environmentally sustainable [5-7], and it can be viewed as both, an "institutionalized practice" and a "factor of institutionalization" [8]. As an instrument, EIA is a process to evaluate and analyze the potential impacts of human activities on the environment using the precautionary principle and find actions required to prevent environmental degradation and loss of natural resources [7,9] and facilitate decision-making for project approval. However, from the perspective of the affected community, EIA may be about living endlessly with impacts [10]. On the other hand, EIA professionals, expected to be knowledgeable about risks to physicochemical, ecological, and social environments are obligated to the project proponents. Despite ample theoretical and practical experience, apprehensions are expressed about the EIA meeting its objectives [11]. Moreover, in practice, EIA has grown into a complex, technocratic, and interdependent system and a time-consuming process that can frustrate project proponents, communities, and regulators alike [10,11]. A continuous evolution [12] including improvements, simplification, and refinements of the EIA process is witnessed through global experience sharing and efforts aimed at boosting the effectiveness, efficiency, and participatory nature of the EIA process and its potential role in realizing sustainable development [8,13]. The EIA regimes have undergone multiple changes and "reforms" over the last five decades or so, primarily aiming to improve environmental outcomes through changes in the EIA regulation, framework, and procedures and broadening the purposes of EIA [14] that are adequately documented. Additional changes have also resulted from simplifications and streamlining attempts [15,16], and sometimes evading the issues [17]. The EIA scholars are, however, apprehensive of such changes and so-called "refinements" or "reforms" that affect accomplishing goals and benefits of the EIA [3,15,18].

EIA is primarily meant to improve project design further and support informed decisions [19] and is neither intended to stop development or growth nor limit opportunities for communities. However, project proponents consider the EIA process to be an impediment to development because of the time and expenses involved in conducting the EIA study. There is no doubt that the EIA process involves costs for the government to administer the EIA process and for the project proponent to prepare the EIA report and manage compliances [14]. Further, potential delays and uncertainties [14,20] in obtaining the environmental approvals may result in time and cost overruns for the proposed projects and hence loss of business opportunities, given that time is the essence of the business. The concerns of the project proponents may be genuine and should be addressed but without overlooking or disregarding the concerns for environmental protection and ecological and sociocultural aspects of society. Good practice principles for EIA are evolved although these are subjective and their implementation is contextual to the wider institutional structure within which the EIA system operates as reviewed and discussed by several researchers [11,14,19].

## 2. Scope and methodology

It is observed that despite a wealth of literature available on EIA good/best practices, the quality of EIA reports/environmental impact statements, and the effectiveness of EIA remain a concern for the researchers. Moreover, project proponents continue to treat the EIA as a barrier to their investment plans for development projects because it is time-consuming as well as expensive. Given the above, the present work attempts to explore the ways and means to improve the quality of the EIA reports and EIA effectiveness and simultaneously reduce the time involved in the EIA process in India by adopting workable good practice EIA and rationalizing the EIA process. The approach adopted for this study is similar to that followed in the literature [10], i.e. based on an extensive literature search and experience of the author from his long association with academics, EIA review, and accreditation process for the EIA consultants, and his research and publications to ex-

amine the shortcomings and suggest a set of key effective EIA practices. The suggested practices would guide the implementation of an effective environmental assessment to support environmental protection and environmental management. The proposed practices, distilled from the good practices available in the literature, are not intended to be comprehensive but it is expected that these would help fulfill the objectives of the EIA, meet stakeholders' expectations, and could be operationalized readily in India and also in the countries having similar political and socioeconomic settings.

The terminology of "good practices" [11] is used in this work rather than "best practices", given the philosophy underlined in the quality management system that there is always a scope for further improvements. Good practices in EIA are expected to improve the effectiveness of the EIA, with a simple understanding that "effectiveness" [21] is achieving the predefined objectives of EIA, viz. the extent to which EIA addresses environmental objectives, and incorporates environmental concerns into the development and environmental approval/clearance of projects even though there is no general agreement in the vast literature on the definition of the term "effectiveness" of EIA [22-24]. The evaluation of EIA quality and EIA effectiveness is beyond the scope of this study. A simple understanding of EIA effectiveness, focusing on the objectives of the different stages of the EIA process [25,26] could aid the analysis of the determinants affecting EIA effectiveness [21]. However, the extent to which good practices lead to improving EIA effectiveness- procedural as well as EIA assessment methods, and quality of EIA reports requires further empirical studies and research under different contexts.

## 3. EIA challenges, practices, and reforms

The literature review on EIA reports' quality, EIA effectiveness, and EIA good practices is briefly recapitulated below, given that the detailed overviews for these facets are very well documented and readily available.

### 3.1 EIA reports' quality

There appear no standard requirements for an EIA report to be qualified as a good quality report although there is a good amount of literature related to different aspects of the quality of EIA reports [12,27-31]. The EIA consultants influence guiding quality performance, partly due to their vital knowledge of the subject and by their perceptions about their responsibility requiring a balance between maintaining good business relationships with those hiring them for the environmental impact assessment through "good enough" quality to get them environmental clearance (EC) and maintaining a good professional reputation of adopting "best" practice as recognized by them [32]. However, the bottom line for a good quality EIA report is that it fulfills the objectives of the EIA [33]. Further, good quality EIA reports are also expected to contribute to enhancing the overall effectiveness of EIAs, more so, when the institutional framework is not robust, public participation is not effective, and there is limited expertise on the part of the designated authority deciding on the grant of EC to the proposed projects. The factors that could be attributed to project proponents/EIA consultants, designated authorities, and others for the quality of EIA reports are highlighted [34]. The salient features of a good quality report [31,34], evaluation of the EIA quality mark certification scheme [35], and "Enhancement Quality Testing Framework" structured around performance indicators to evaluate enhancement measures detailed within EIA reports [36] are presented in the literature.

### 3.2 EIA effectiveness

EIA effectiveness encompasses how specific aspects of EIA get managed for a project, the efficiency of the EIA process as a whole, and the benefits of the EIA [19,37]. The legal requirement appears to be the main explanatory factor for EIA effectiveness in several countries [21], given that the main parameters explaining the *ex-ante* effectiveness are hastening the EIA process for decision-making and *ex-post* effectiveness is the mandatory requirement to con-

duct EIA. As a result, EIA is primarily viewed from the legal and procedural angles [38], rather than how the instrument is used through all the stages with a focus on outcomes [39] to optimize the environmental performance of the project [40]. It is reported that procedural effectiveness with a focus on the regulatory framework, quality of EIA reports, and EIA good practices [41,42] and the EIA process, in general, have received more attention [43] than the effectiveness of impact assessment methods and methodologies employed [24,44,45]. Given that compliance with the regulation tends to be generally high [45], legislative support is necessary for the use and implementation of methods and methodologies for impact assessment, besides guidelines to implement the EIA process and framework of the EIA report to further the EIA effectiveness. The EIA's effectiveness could be evaluated based on the objectives of the process, management of the environmental policy, and interests as well as expectations of stakeholders [46].

### 3.3 EIA good practices

The five main guiding principles for EIA [47] are further developed by several researchers into a range of additional principles and characteristics for effective EIA [11,48,49], best practice principles [33,50], and resilience assessment [51]. Overviews of the EIA best practices are well documented in EIA books and reports, IAIA best practice guidelines, and publications in several journals [11,14,30,52-58]. Good practices are developed continuously to improve the quality and effectiveness of the EIA in the backdrop of key challenges to the EIA process, viz. weak regulatory regime, limited capacity of EIA consultants, lack of or weak public participation, weak institutional mechanism for EIA follow-up [19], etc. especially in developing countries. Good practices are evolved for both [19], the a) institutional and managerial aspects like systems and processes employed to frame the EIA regulation and its implementation to conduct EIA, review, decision-making, and follow-up, and b) techniques and tools for EIA like scientific, predictive and analytical tools for establishing baseline conditions, impact prediction and evaluation, risk assessment, assigning the significance of environmental impacts and risks, selecting mitigation actions, monitoring, and evaluation of outcomes. 74 good practices for EIA are proposed [11], grouped under 22 themes. International best practice principles for EIA follow-up, a vital element of EIA, are reviewed, and the revised EIA follow-up best practice principles are proposed [59].

### 3.4 EIA challenges and EIA reforms

Several researchers [10,30,60,61] have analyzed the challenges of the EIA process. These could be broadly summarized as a weak regulatory regime, priority for economic benefits over environmental impacts, the limited scope of impact assessment, non-prescription of methods and methodologies for impact assessment and risk assessment, emphasis on faster EC rather than thorough EIA review, ineffective public consultations, and lack of proper EIA follow-up besides disregarding cumulative impact assessment, sustainability, and climate change-related issues.

The stakeholders and divergent interest groups involved in the EIA process have different agendas and some of them have a limited appreciation of the intricacies involved in the EIA. Project proponents consider the EIA process time-consuming, expensive, and an impediment to investing in developmental projects and expect a straightforward EIA process with the shortest possible duration [62]. Understandably, a project proponent would like to be exempted from going through the EC system or have the least requirements to conduct EIA and prepare the EIA report and receive the EC soon after submitting the EIA report. On the other hand, the public including NGOs would like to have sufficient time to understand the project and its consequences on them and to actively participate in the process. The public at large in developing countries expects employment, basic amenities, and improved physical, as well as social infrastructure in their region from the project proponent, given that public consultation is mandatory for certain projects and public endorsement is needed for these projects. The regulator is invariably hard-pressed for the specified timelines to complete

specific activities. EIA academics and scholars desire an ideal scenario in which good quality EIA reports are prepared to adhere to good practices using the required expertise and adequate time to appraise such reports. Given the above, democratic governments attempt to adopt a "simplified" or "practical" approach to the EIA process and respond to lobbying by the project proponents and political pressure [63]. As a result, there are instances when even after enacting robust EIA regulations, these are diluted in the garb of the so-called "reforms" or "simplification" [3,17,64], overlooking that the prime objective of "protection, maintenance, and enhancement of the environment" may get compromised [7] by government actions.

# 4. Discussion on pursuing the distilled good practices

## 4.1 Addressing the concerns of the project proponents

Understandably, a project proponent would not like to go through the rigor of EC or would rather have the least requirements for the EIA and get EC soon after submitting the EIA report, given that time is the essence of the business. A basic question arises as to whether under the pretext of "rationalization" or "simplification" of the EIA process to facilitate investments in development projects and employment creation, should the EIA process be simplified and quickened by reducing it to prescribing standard terms of reference, impact "predictions" and generic mitigation measures, *ad hoc* EIA review and grant of EC with generic terms and conditions with the objective to reduce the time and cost for the project proponent? This is a big challenge for the EIA process, more so, in democratic countries even though at least one arm of the government is expected to have its obligation of ensuring the suitability of projects [63] from the environmental viewpoint before approving them.

The issue of the EIA process being time-consuming, a major concern of the project proponents and development agencies of the government, could be addressed in India by adopting and adhering to EIA good practices across the EIA process stages. For this, at the initial stage itself, it is necessary to differentiate between greenfield and brownfield projects, understand the project and environmental settings of the proposed location and its surroundings, primary data requirements to prepare the EIA report, availability of the secondary data, whether the technology proposed to be employed is commercially proven and similar projects are in operation in the country, uncertainties involved, etc. Applying these parameters, briefly elaborated below, transparently and consistently to every project proposal would help determine how rigorously the EIA process should be made applicable.

*Project*: Greenfield or brownfield project, the resource requirement- per unit of product as well as, say on an annual basis, infrastructural requirement, characteristics and inventory of emissions and discharges, inventory and hazardousness of materials used or to be produced, confidence level about the effectiveness of control technologies proposed for pollution abatement, supply chain involved, etc.

*Technology:* Authentic information about impacts, mitigation measures, and environmental outcomes if the technology proposed is already being commercially employed within the country. Otherwise, given unknowns and uncertainties, the worst-case scenario needs to be considered.

*Environmental settings:* Proximity to and effect on the designated protected areas, biodiversity, unique species or habitats in the study area, agriculture, water resources, coastal and marine ecosystem, pristine areas, uniqueness of the landscape, religious, cultural, and heritage sites, tribal areas, and population.

Rigorous EIAs would necessitate a longer time to generate primary data, acquire secondary data, or both, conduct detailed environmental impact as well as risk assessment, and prepare an elaborate environmental management program (EMPg). The time involved in preparing and reviewing an EIA report and the associated costs correlate with how rigorously the EIA is to be carried out. It is likely that a large number of proposals may not require

rigorous EIA and such projects could go through the orange channel for environmental clearance, leaving a small number of projects for the red channel. For the brown-field projects, environmental monitoring data available readily from the operating projects could be used as primary data after due validation to save time as well as expenses involved in generating primary data. The funds required to conduct EIAs generally form a minuscule fraction of the project cost, setting at rest the concerns that the EIA process is expensive. Further, the expenses involved in the EIA follow-up need to be internalized by the project proponents.

## 4.2 Why EIA good practices?

Adopting EIA good practices earnestly can help conduct thorough EIAs consistently, assure good quality EIA reports, address various challenges to the EIA process, and improve EIA effectiveness. A key question, however, arises as to whether a "good quality EIA report" is required at all and by whom. Like any product, good quality EIAs could be driven either by stakeholders' demand for good quality or by the initiatives of EIA consultants to create a niche market for good quality EIA reports and get appreciation and rewards from regulators and project proponents. In either case, stakeholders, as well as EIA consultants, must develop a full understanding of good practices through every stage of the EIA process, viz. a) (pre-EIA) action including screening—whether EIA is required, scoping—coverage of the EIA report in case the screening necessitates EIA, and consideration of alternatives; b) preparation of EIA report; c) review of the EIA report and decision-making on environmental approval; and d) EIA follow-up for compliance monitoring and performance audit in each lifecycle phase of the project. A good quality EIA report may appear to be relatively expensive but it would be beneficial to project proponents in the long term given that it comprehensively brings out the potential issues upfront and adds value to the project design. Being a focused report also saves time in the EIA report preparation and EIA review.

## 4.3 Distilled good practices in the operating principles of the EIA process

### *Pre-EIA action*

A good practice screening considers the potential impacts of the project proposed at a particular location in the case of greenfield projects and the incremental impacts of brownfield projects. In the Indian context, the EIA regulation [65] specifies a positive list of the projects that require mandatory EIA irrespective of the location. It is necessary to develop clarity about what is expected from the project proponent and what is to be incorporated in the EIA report to determine the breadth and depth of the EIA report. Among others, supported by a suitable regulatory framework, good practice scoping takes into consideration limitations of data availability as well as its accuracy from the pre-feasibility or techno-economic feasibility report stage of the project life-cycle to conduct, e.g. detailed material balance and energy balance for emissions and discharges, and water balance calculations besides the propriety and confidentiality of the data and prescribes a) project and site-specific TOR for the preparation of the EIA report rather than no TOR; b) tailor-made TOR rather than detailed generic standard TOR [63]; c) distinct TOR for green-field, brown-field, and expansion project [66]; d) effective methods and methodologies with thorough structures and implementation [67] to be employed for accurate impact assessment that would facilitate suggesting appropriate mitigation actions using the hierarchy of avoidance, minimization, and control of impacts within the acceptable levels and compensation and effective EMPg; e) type of alternatives [68] to be considered, viz. with respect to the project, project size, site-location, design for the selected project, construction and operation for a given design, timing for project construction and operation, and no project or no action alternative; and f) TOR to carry out cumulative impact assessment and any other special studies. The review of the TOR after detailed site-specific investigations are carried out [30] may also be necessary in some cases. Under the need "to do something about climate change",

gate-to-gate lifecycle assessment of greenhouse gas emissions is being asked for in the EIA report, a positive move initiated recently in India. However, this requirement needs to be applied to projects that have a high potential for greenhouse gas emissions as documented by the IPCC rather than across the board. Such a good practice scoping will help guide well-focused EIAs and hence save resources for the project proponents in preparing the EIA reports.

Material balance is essential to ascertain the pollution load/release inventory of emissions and discharges from the production and allied processes. However, by sharing this information, the project proponent may not only violate the contractual obligations with the technology licensor but also invite the risk of jeopardizing its commercial interests. The insistence on such information in the EIA report forces the project proponents to follow the path of least resistance, i.e. give cooked-up information with a clear understanding that the regulator does not have time or expertise to verify it. Given the confidentiality of such information for the project proponents of, e.g. specialty chemicals and performance chemicals projects, good practices may focus on environmental outcomes, adequacy of the mitigation actions, and mechanisms for monitoring and auditing based on due diligence of the project details and the available information on the efficiency of the resource utilization, and waste generation and impact assessment based on worst-case scenarios. Once the project is operational, the information on emissions and discharges would get revealed from the monitoring and audit besides the effectiveness of the mitigation actions. Likewise, security, national defense, and strategic projects need to be viewed through different lenses and approved with proper environmental safeguards.

### *EIA report preparation*

Workable distilled good practices in the preparation of the EIA report are summarized in **Box 1**. Good quality EIA reports should be prepared by following the spirit of the TOR [34]. Citing references rather than describing theory in the EIA report can reduce its bulk. Good practice EIA entails that the EIA report is written in such a manner that different chapters are linked with each other and properly documented [31] to facilitate EIA review, derive terms and conditions for EC [69], and aid EIA follow-up [59,70,71].

Given that several stakeholders are not likely to read the main EIA report, and the public at large may not understand the technical jargon, good practice executive summary of the EIA report is written in simple non-technical language highlighting the key issues, and the findings from the detailed EIA study in a crisp manner and is complete [72]. It also becomes handy for the decision-makers who are generally under the pressure of time due to timelines prescribed for the different stages of the EIA process and the large number of project proposals received in developing countries.

### *EIA report appraisal/review and decision-making*

a. Public consultation

Given that public consultation with the general public and public hearings for the stakeholders is an important pillar of the EIA process [63], the project proponent needs to appreciate that the stakeholders should get full opportunity to know about the project including its resource requirements, and its impacts for them- adverse as well as beneficial and that a genuine positive relationship with the local population helps build mutual trust that is always beneficial to the project in the long-term. Good practice public hearing recognizes its important role, more so, in developing countries, given that the local resources of the economically weaker sections of the society get shared by the proposed projects, resulting in adverse impacts with which the local population may have to live both, individually and collectively as they perpetually get paper promises [10] from the project proponent for the benefits that hardly accrue to them. Good practices advocate that the public hearings are held earnestly, not stage-managed, and are bona fide in which the authorities facilitating the public hearings display soft corners for the local population, without getting influenced by project proponents. A good practice of mandatory videography of the

**Box 1.** Distilled good practices for EIA report preparation.

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|---|
| 1. Consider all the activities involved in the proposed project in its lifecycle. For example, an industry project needs to encompass battery limits plant, offsites, utilities, warehouse, transport and unloading of feedstocks, storage tanks, loading and transport of products, by-products, and side-products, infrastructural facilities required, etc. |
| 2. Consider the activities in all the phases of the project in its entire lifecycle, viz. preconstruction, construction, operation, maintenance, suspended operation, project closure, and decommissioning |
| 3. Exercise sense of proportion while describing anything in any chapter, i.e. the description should be relevant and have correspondence with the EIA study. |
| 4. Bring out the project details that would help identify potential impacts from different activities involved and the corresponding technical details |
| 5. Bring out the environmental sensitivity of the project site and its surroundings (core and buffer zones) and describe the environmental components/attributes that have a potential threat of getting affected by any of the project activities- normal or abnormal |
| 6. Describe distinct components of the environmental impact assessment, viz. impact identification, prediction, and evaluation/ assessment based on the methodologies specified in the TOR or well-known/widely practiced methodologies. These pertain to both, spatial and temporal impacts for the different typologies, viz. temporary, permanent, occasional, ongoing, short-term, long-term, reversible, irreversible, and spatial spread |
| 7. Use appropriate software/model for predictions, with a full understanding of its applicability and limitations for quantitative prediction of the impacts |
| 8. Describe the impacts on different receptors in the predicted impact zone, with a serious and objective discussion on, e.g. impact on the different attributes of the physical environment; LU/LC, soil, and landscape changes and impacts thereof; impacts on species- terrestrial, aquatic, marine and avian, habitats, grasslands, etc; social and cultural impacts; risk assessment; and cumulative impacts |
| 9. Establish the significance of the impacts described above, using prescribed or specific and contextual criteria |
| 10. Suggest mitigation actions corresponding to each of the established significant impacts, not generic under normal, abnormal, and suspended/abandoned operational scenarios, using the mitigation hierarchy of prevention, minimization, and control of impacts and compensation |
| 11. Integrate risk mitigation actions into the EMPg |
| 12. Propose remedial measures for the properly assessed residual impacts |
| 13. Propose a specific, not generic EMPg with details of the proposed actions and corresponding estimated budget, facilitating its implementation by the project proponent and designing EMS to internalize the environmental concerns |
| 14. Suggest an administrative framework to operationalize the EMPg, aligned with the overall organizational setup |
| 15. Assimilate mechanisms for monitoring, audit, and management review into the EMPg |
| 16. Imbibe mechanism to update the EMPg, considering the terms and conditions of the environmental approval, periodic audit and review, and changing regulatory requirements |

Source: Compiled [11,31].

proceedings of public hearings by the designated authority is in place in India.

b. EIA review

When all the projects go through the same set of lenses due to a lack of a test for the significance of the environmental impacts, the time taken to review EIAs is long even for the projects having no serious impacts. Good practice EIA report appraisal entails that the EIA reviewers are clear about the objectives of the EIA review, viz. to determine whether the EIA report is complete [19,27,73], and contains correct and comprehensive environmental information related to the project that would facilitate well-informed decision-making. The desired information includes a) how physical, ecological, social, and other impacts are identified, predicted, assessed, and addressed; b) how actionable, adequate, and effective are the suggested action measures; and c) the suitability of the mechanism proposed for periodic monitoring, audit, management review and updating the EMPg. The low scores for the quality of the EIA report due to several shortcomings are reported [30]. Experts also echoed these views [38]: "The overall quality of the EIA reports is below par. One can observe the poor quality in almost all the material chapters of the report." "At times, EIA reports are approved without proper scrutiny due to shortage of time, lack of understanding, or any other factors, and quality of the EIA reports is the first victim." Good practice EIA report appraisal recognizes a strong correlation between a robust EIA appraisal system and the quality of EIA reports. Thus, the appropriateness and quality of EIA reports are considered to be important in EIA reviews, not the volume of information to help visu-

alize a much bigger picture, far beyond the procedural issues. Given that the project proponent and EIA consultant have a vested interest in preparing the EIA report, good practice EIA review essentially serves as a quality control exercise for the EIA reports and hence the EIA effectiveness [28]. It encompasses: a) a robust and comprehensive EIA appraisal/review mechanism imbibed into a well-formulated EIA regulation; b) appraisal procedure with appraisal criteria specified in the regulation; c) meticulous, transparent, and effective implementation of the regulation; d) a more structured, independent, transparent [11,49], participative, interdisciplinary, objective, uniform, detailed, grounded, and consistent appraisal system with no room for *ad hoc* and weak appraisal based on the presentation given by the project proponent on the EIA report over half-an-hour or so [38]; e) in-depth and thorough appraisal of the EIA report done by each member, followed by the overall judgment of the appraisal committee; f) accountability of project proponents for the quality of impact assessment, mitigation actions, and EMPg; and g) transparency in the process to constitute appraisal committees, not just the eligibility criteria for members notified in the regulation. Thus, a good practice EIA appraisal mechanism helps motivate or impel the project proponents/EIA consultants to prepare good quality EIA reports, a major indicator of the overall effectiveness of the EIA process. A two-tier structured, transparent, and criteria-based EIA review mechanism [31] reflects good practice EIA review.

c. Decision-making and communication

The decision for the EC of the project is communicated by the designated authority to the project proponent invariably with a set of terms and conditions. Good practice decision-making recognizes that the objective of the terms and conditions [74] is primarily to establish basic rules for the project proponent, rectify minor deficiencies in the EIA report, monitor impacts- physical, ecological as well as social to ascertain that these are within the permissible/acceptable levels, and verify that the project proponent fulfills commitments made in the EMPg. Good practices require that a) a long list of irrelevant, ineffective, inadequate, and unenforceable EC conditions give an impression of greenwash and are not suited for good practice EIA; b) EC conditions are directed at measuring the environmental performance of the project to catalyze achieving sustainability targets, a prime objective of the EIA; c) EC conditions are key to the effective implementation of the EIA follow-up that has a much broader scope; d) appropriateness of the EC conditions reflect competence, commitment, and autonomy of the appraisal and decision-making system; e) effectiveness of the EIA follow-up including compliance with the EC conditions by project proponents reflect on the institutional framework; and f) EC conditions imply conducting a thorough EIA appraisal. A good practice comprehensive and well-formulated EIA regulation specifies a mechanism that helps prioritize the well-specified EC conditions, resource allocation for EIA follow-up, and stakeholder engagement. To ensure that the rules are followed for effective actions, good practices help exhibit commitment from i) the regulator in terms of, e.g. prescribing consistent, comprehensive, unambiguous, relevant, implementable, enforceable, measurable, monitorable, and auditable conditions to facilitate a robust EIA follow-up adhering to good practice principles including rigorous examination of the periodic compliance reports received from project proponents, not just adopting the tick-box approach, and ii) the project proponent in terms of self-regulation, e.g. compliance with the regulatory requirements and the prescribed terms and conditions, internalizing the prescribed actions in the form of the environmental management system, and responding to public pressure [74].

### *EIA follow-up*

Good practice EIA follow-up recognizes the importance of the EIA follow-up, given that ultimately the actual impacts are relevant to protect the environment, not the predicted impacts, and that the follow-up alone can provide concrete evidence of the environmental outcomes [59] through monitoring and auditing. EIA follow-up consists of five elements: monitoring, evaluation, management, participation, and governance [75], and a mechanism to improve

environmental outcomes by learning from the earlier management actions [14,76]. It needs to ascertain and incorporate: a) regulations and institutional arrangements; b) approaches and techniques in the follow-up practice; c) resources and capacity to undertake follow-up; d) types of activities to be followed up; and e) role for major stakeholders, viz. project proponent, regulator, and public. The design and implementation of the revised EIA follow-up best practice principles [59] help to strengthen the overall EIA system further. Implementing the good practices discussed above, aligned to the global practices being evolved, with a commitment to environmental protection from the regulator, as well as the project proponent, can assure good EIA quality, and also address challenges for EIA [10,60] including those related to climate change [7].

### 4.4 Strategic environmental assessment

In addition to good practice project-level EIAs discussed above, the use of formal strategic environmental assessment (SEA) and strategic planning with greater public participation, among others, also help streamline and strengthen the project-level EIAs and environmental clearance processes [14] by shaping alternatives, anticipating project-level issues and mitigation and hence improve scoping for the EIAs for focused EIAs [77] and subsequent actions. A strategic or regional impact assessment framework also strengthens cumulative impact assessment [19,78,79]. The SEA for industrial clusters facilitates decision-making about the type, number, and siting of industries that are water-intensive, high wastewater generating, air emissions-intensive, or involve hazards and have high-risk potential, especially those planned in the proximity of the population and ecologically sensitive areas. Tiering, i.e. the organized transfer of information between SEA and EIA processes helps in delegating certain features to the appropriate assessment levels, improves the unification of environmental considerations across tiers, and hence avoids duplication of assessments [64,77,80]. This assists in improving the consistency of information to aid decision-making, complement sustainability across planning hierarchies [81,82] through strategic considerations such as climate change, and advance sustainable development goals using sustainability criteria during planning [39,83]. The overall scheme is expected to save resources including time [84,85] for project-level EIAs and help overcome its limitations.

## 5. Conclusions

Once good EIA practices are in place, there are better chances of getting good-quality EIA reports from the project proponents. This hypothesis is validated by the quality of the EIA reports prepared by the Indian EIA consultants for multilateral-funded projects [69]. Although the implementation of EIA principles is contextual to the system within which it operates, its practice should be consistent across the country. The screening process should be well defined in the EIA regulation through positive/negative lists and the projects classified into different categories. In the Indian context, the projects categorized as "A" and "B" need to be revisited to harmonize the environmental settings of proposed projects with size thresholds and potential environmental risks. "A" category projects should be given terms of reference on a case-by-case basis considering the environmental settings of the proposed location, the potential significant impacts, and environmental risks, and "B" category projects could be permitted to prepare the EIA reports based on standard TOR, given that such EIA reports need not be as extensive as those for "A" category projects. Further, good practice scoping should distinguish the projects based on their potentially significant biophysical, socioeconomic, cultural, cumulative, and sustainability impacts [31,86-88]. The scoping and expanse of the EIA reports of greenfield and brownfield projects and the projects proposed in industrial parks/estates having well-developed industrial and environmental infrastructure are also different. The case-by-case scoping, focussing on the critical concerns and the key issues that have the potential to cause environmental degradation [89] helps prepare a well-targeted and comprehensive EIA report and hence saves time and resources associated with the EIA process, the very objective with which

standard TOR was possibly introduced [90].

"Simplification" to compress the time for the EIA process should not be at the cost of affecting/sacrificing the pillars of the EIA [63], viz. scoping for the projects having significant potential impacts, determining the significance of environmental impacts, and public participation (open or limited). Any "reforms" in the EIA process should be done cautiously, addressing the concerns of researchers [2,15-17,91] and ensuring that the sanctity of the EIA is not negotiated and no room is given for apprehensions about retrograde steps [64]. The "reforms" in the EIA process need to be aimed at moving from the current practice of emphasis on procedural design to outcome-based [39], risk-based environmental assessment [92], and sustainability assessment [51]. There is no doubt that good practice scoping will require expertise and time but many projects having minor and manageable impacts will be spared from undergoing extensive EIA.

The authentic and updated information on the availability and inventory of resources, environmental monitoring, and meteorological data in the public domain could help minimize the time generally spent in generating the field data and hence minimize the overall time for the EIA and its cost too. Good practice EIA, focusing on the key issues, improves EIA effectiveness and simultaneously addresses the major concern of many project proponents that the EIA process is time-consuming. The saving of resources involved in completing the EIA process [11,19] thus addresses the concerns of a sizeable number of project proponents as well as the government while ensuring environmental protection. The wide range of good practices indicates the complexity of EIA and implies that the overall success of environmental assessment is dependent on addressing several factors. Flaws in any one dimension may impair the rest of the EIA process [11]. Good quality EIA reports focussing on significant environmental impacts, rigorous EIA review, and appropriate terms and conditions for environmental clearance and EIA follow-ups would be the key outputs of the good practice EIA. The rationalized and refined EIA procedures ensure objective and high-quality EIA studies [93] based on high-quality data, analyses to predict the impact [94], application of appropriate methodologies for assessment, and advancing beyond the current EIA practices [7]. Further empirical studies and research under different contexts are required to better understand the extent to which good practices could improve EIA effectiveness.

# 6. Way forward

The policy-makers need to recognize that rational reforms in the EIA process along with good EIA practices result in a win-win situation for all the stakeholders involved in the EIA process including the mute environment. Good practices should, thus, be followed for effective EIA, right from framing the EIA regulatory regime through EIA follow-up, given that weak scoping will not lead to accurate impact assessment, and inaccurate impact assessment will render the environmental management program inadequate in controlling and containing impacts and hence the environmental protection would be ineffective in the long term [67] in bolstering sustainable development. In the absence of a robust EIA review, there is no quality control check on the EIA reports, and decision-making cannot be well-informed [74]. Improper environmental clearance terms and conditions weaken the EIA follow-up; hence the EIA outcome is inappropriate, making the EIA process a mere formality. Thus, a holistic understanding and consistent approach for good practices in the EIA process should be developed for the overall accomplishment, given that shortcomings in one facet or a weak link may undermine the entire process [11] and its effectiveness. The assessment of alternatives from environmental and social perspectives in addition to technical and economic viewpoints in a thorough, transparent, and unbiased manner right from the "upstream" stages of the development planning through the stages of project identification, site selection, project design, and implementation should be imbibed into the regulation so that EIA could contribute further to improved decision-making [68] for sustainable development. Further, the core of the EIA needs to be strengthened with good practice robust EIA

regulation, and its strong implementation for meticulous scoping, EIA review, and EIA follow-up with an in-built system of periodic review and incorporation of feedback from the implementation experience [30,61,95,96] so that the regulation does not operate linearly as at present [97].

Appreciating the limitations of the project-level EIA systems, at least large and integrated projects should be subjected to SEA-sectoral or regional environmental assessment duly backed up with suitable regulatory provisions. Thus, effective SEA [14,19,85,98] as integral to the planning process for economic development, and other forms like sectoral assessment and regional environmental assessment, with a wider public consultation, should be adopted to boost the overall efficiency and effectiveness of the EIA process. The practice of tiering also needs to be adopted to further streamline and strengthen the EIA process, improve the consistency of information to aid decision-making [77], and save time in the preparation of project-level EIAs.

Given that imbibing good practices into the EIA regulation and adopting good practices by the regulator in any country through the entire EIA process are the prerequisites for the fructification of good EIA practices, the designated authority making regulations and granting environmental approval, and EIA reports appraisal committees recommending the environmental clearance should roll out the ball to adopt and promote good practice EIAs. Simultaneously, to start, the project proponents of large projects and the leading EIA consultants may be motivated to take lead to prepare EIA reports following good practices through incentives like priority scoping and EIA report review, fast track decision-making, and support to self-regulate the EIA follow-up. Given that the taste of the pudding is in its eating, the test of EIA effectiveness is in the project's environmental performance for which its design, proclamation, and implementation of EIA good practices are prime requisites.

## Conflict of Interest

There is no conflict of interest.

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