

Beyond 25 years of EIA in India: Retrospection and way forward

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ABSTRACT

Environmental Impact Assessment (EIA) experience in India dates back since the 70s when it was practiced only as an administrative decision. However, it was not made mandatory until 1994 with the introduction of the EIA Notification under the Environmental Protection Act of 1986. Hence, it's been just over 25 years since EIA was formally introduced in the country and in celebrating this landmark occasion, the paper provides a review of EIA performance in India since its inception. In doing so, it provides a systematic analysis against criteria set by one of the first EIA reviews conducted in the country way back in 1994. The four broad categories of this review include completeness, open and public character, objectivity and verifiability. In conducting the review, the paper consolidates publications on this subject area. This is further complemented with data collected via online survey and interviews with experts in the field. The findings reveal that since its inception days, EIA in India has made significant progress with regards to open and public character. However, this is still in need of further improvements. With regards to the other two criteria of completeness and objectivity, progress is rather limited. However, there has been hardly any improvements made with regards to verifiability of EIA. The new EIA notifications being drafted in the country do not seem to be engaging with the lessons learned over the years. Hence, based on the findings of the review, the paper provides some initial recommendations. In doing so the work further draws comparisons and inspirations from international experiences.

1. Introduction

Environmental Impact Assessment (EIA) i.e. Environmental Assessment (EA) applied at the project level has been formally introduced and made mandatory in the Indian legislation via the EIA Notification of 1994, which was enacted under the Environmental Protection Act (EPA) of 1986 (Paliwal, 2006). However, the foundation of EIA in India was first laid in 1976–77 when the Planning Commission directed Department of Science and Technology (DST) to examine major projects from an environmental angle for supporting administrative decisions. These were mainly river valley projects followed by major public sector projects. In 1986, the need for incorporating environmental considerations within the Indian planning process was first reflected through the umbrella EPA legislation which required environmental appraisal to be undertaken for certain projects (Valappil et al., 1994). Hence with nearly three decades of EIA experience and with more than 25 years of mandatory requirement of EIA in India, the EIA system within the country continues to suffer from various weaknesses (Rathi, 2017). This paper offers a systematic review of EIA in India since its inception and

accordingly presents a comprehensive overview of the academic literature, which has been published on the subject over the last three decades. Secondly, in doing so this review not only identifies the strength and weaknesses of EIA in India, but it does so retrospectively, allowing us to trace how things have changed or not changed over the years. Third, though the EIA system in India has been reviewed by various authors, they have adopted different approaches in carrying them out. Therefore, the discussions have not allowed for a systematic comparison to be drawn. This work will allow such comparisons to be drawn by adhering to the methodology adopted in the earliest review paper (See methodology section). It should be further noted that this initial review criterion allows the paper to conduct a holistic review, which looks at both procedural changes along with substantive changes such as the influence that EIA has had in decision-making. Furthermore, the survey and interviews have engaged with stakeholders representing practice, consultancy and academia enabling a well-rounded view to be established. Finally, based on the findings of the review, some initial recommendations have been drawn.

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1.1. Setting the context: EIA in India

During the last three decades, EIA has come a long way but so has India. The EIA Notification of 1994 was amended 11 times in 12 years and eventually was replaced by the EIA Notification of 2006. The 2006 Notification too has been undergoing a series of changes with 40 interventions in the last 14 years (Jha-Thakur and Rajvanshi, 2020). At present, the country faces tremendous growth pressures and tricky environmental challenges relevant both to the developed and the developing world. An increasing population and rapid urbanisation compounded with global environmental problems such as climate change is bringing about additional environmental challenges and vulnerabilities. Furthermore, failure of the developmental planning process in adequately protecting the environment and the new changes to the organization of the planning system in India under the present political environment, emphasises the need to evaluate the role that EIA and more broadly EA needs to play in India (Turaga et al., 2019). Therefore, the aim of the paper is to review EIA performance in India since its inception and accordingly provide recommendations in order for it to play an effective role in the future of the country. The description of the EIA system in terms of institutional set-up and procedures adopted are beyond the scope of the paper though it refers to several published articles that do this effectively. The rest of the paper is broadly divided into four sections. In the following section, the methodology adopted is presented. In the third section, EIA in India is evaluated retrospectively since its inception against the approach used by Valappil et al. (1994). In the following section, EIAs future role is explored while providing recommendations and finally overall conclusions are drawn.

2. Conceptual framework and methodology

It is worth noting that there have been four major reviews undertaken for the EIA process in India, which includes Valappil et al. (1994), Banham and Brew (1996), Paliwal (2006) and Rath (2017). The earliest review was done by Valappil et al. (1994), and this review was based on the EIA system and practices that existed before EIA was mandatory through the EIA Notification in 1994. Furthermore, the review framework used in this study is holistic in nature enabling both procedures to be reviewed along with the influence that EIA has had on decision-making in India. The other reviews conducted for EIA in India have focused either on a SWOT type of analysis (Paliwal, 2006; Rath, 2017) or have focused on quality review of procedural strengths and weaknesses (Banham and Brew, 1996). However, the timing of Valappil et al. (1994) paper along with the breadth and scope of the criterion provides itself as an ideal benchmark against which, the EIA system of the country can be evaluated through its evolution over the last quarter of a century. Hence, this paper adheres to the methodological approach adopted by Valappil et al., 1994.

Valappil et al. (1994) used Devuyt's review package (Devuyt, 1994), which was based on Lee and Colley, 1990 and consisted of seven criteria. This included determination of activities subject to EIA, scoping, preparation of EIA report, independent control, public participation, decision-making and post-project analysis. Valappil et al. (1994) categorised these seven sub-criteria into categories of a) Completeness, b) Open and public character and c) Objectivity and Verifiability. The last category dealt with objectivity and verifiability together in their analysis. However, with the evolution of the EIA system around the world and in India, verifiability, which relates to effectiveness has developed as a strong component on its own right (Jha-Thakur and Fischer, 2016) and has been investigated as a separate category in this paper (See Table 1). Furthermore, the first review of the EIA system was published in 1994, which is the same year when the EIA Notification was passed in India. Therefore, following this approach allows us to trace the evolution of EIA in the country systematically since its inception.

Valappil et al. (1994) used two reviewers to conduct the review

Table 1

Explanation of Criterion used in the study.

Criteria	Explanation	Sub Criteria
Completeness	This is usually associated with the EIS report and addresses concerns related to discussion of relevant environmental effects; consideration and discussion of alternatives and mitigating measures; availability of guidelines especially with regards to techniques and methodologies; types of projects included within the list for EIA and whether possibility of transboundary EIA and EIA for policies, plans and programs (in other words known as Strategic Environmental Assessment-SEA) are considered.	Do you perceive the list of projects requiring EIA to be robust (Screening)? Does EIS report always considers the key issues of the project and discusses them in adequate depth (Scoping)? Are alternatives usually considered within EIA in India? Are mitigation measures adequately covered in EIA? Are there adequate guidelines available for techniques and methodologies to be used in EIA? Are EAs carried out above the project level? Does EIA consider transboundary issues?
Open and public character	Considerations in this category includes the role of EIA in discouraging the possibility for authorities to take arbitrary political decisions, enhancement of democratisation of decision-making; incorporation of values, needs and knowledge of local population and availability and transparency of EIA related documents, reports and decisions to public.	Is public participation adequately conducted through EIA? Does EIA include local knowledge, values and needs? Does EIA enhance the democratisation of decision-making and discourage arbitrary political decisions? Has the Indian EIA process achieved transparency?
Objectivity	This deals with expertise of the people who are involved in the preparation and review of the EIA reports; independence with which they can conduct their role without conflict of interest; overall credibility and neutrality of the EIA process.	People involved in the EIA report preparation have achieved the required expertise? People involved in the EIA process have independence with which they can work without any conflicting interest? Overall do you think the EIA process in India is credible and neutral?
Verifiability	This relates to the requirement of external inspection and control for every step of the EIA procedure; possibility to check whether the proponent adheres to the procedure and if the contents of the EISs are of quality; the extent to which the results of the EIA influences the decision-making process; possibility to check the accuracy of the predictions made and finally the effectiveness of the mitigation measures carried out.	Are there efficient compliance monitoring to ensure proponents adhere to procedures? Does EIA influence decision-making? Do you think EIS is of good quality? Are the accuracy of predictions verified? Are the mitigation measures effectively carried out in practice?

(Based on Devuyt, 1994; Valappil et al., 1994).

process. However, in this paper, the review is being done on the basis of the information available from three essential sources, which include a) systematic literature review; b) online survey amongst EIA stakeholders in India and finally c) interviews with five EIA experts from India. These data collection methods are also spread through the years and the findings from these sources is further complimented by a wider literature review of published articles and books, as well as grey literature and material available on the internet.

2.1. Systematic literature review

The study sets out to evaluate EIA practice in India by systematically reviewing the related literature published in international journals till date, which is over the span of last 32 years (1986–2020). This time span further makes sense as the umbrella act of EPA under which EIA was introduced was enacted in 1986 and this helps in setting the context for the mandatory uptake of EIA in the country. Following on from the approach adopted by Jha-Thakur and Fischer (2016), this work focusses on four leading international journals on EA, namely Environmental Impact Assessment Review (EIA Review), Impact Assessment and Project Appraisal (IAPA), Journal of Environmental Assessment Policy and Management (JEAPM) and Journal of Environmental Planning and Management (JEPM). Fig. 1 provides a summary of the 28 articles published in these journals, which relate to EA in India. This includes articles, which are dedicated on EA in India or within which, India has featured as a comparative case study or constitutes part of a wider survey.

As far as the focus of these papers are concerned, they can be discussed under the categories of sectors and EA procedures. Hydro Power sector seems to be the most popular sector with six papers being dedicated on the subject (for e.g. see Diduck et al., 2007; Erlewein, 2013), followed by biodiversity related projects and programmes, each of which have been discussed in three papers (e.g. Khera and Kumar, 2010). Apart from these, coal mining, nuclear power, urban planning/land use and highway projects have also been specifically discussed. Certain papers have looked at multiple sectors including transport, cement, oil and gas exploration, bulk drug and drug intermediates and industrial estates (e.g. Sainath and Rajan, 2015). With regards to EA procedures, six papers have looked into public participation and community development making it the most popular stage of EA to be discussed (e.g. Rajvanshi, 2003). Other procedural stages which have received special attention include, scoping and follow-up (Jha-Thakur et al., 2009a, 2009b; Rajaram and Das, 2008).

2.2. Online survey

Secondly, the study draws results of an online survey to complement the findings where ever appropriate. The survey was conducted in India (June 2013) in unfolding the perception towards effectiveness of EIA in the country. The three parts of the survey helped in establishing—a) the respondent's background in terms of educational, experience and role within EIA; b) the respondents' perceptions on EIA's influence in decision-making in India, and c) part three focused primarily on what an ideal EIA system in India may look like and what opportunities were available for doing this. A total of 176 responses were available. It should be noted that the online survey was based in 2013, hence perceptions may have evolved since then.

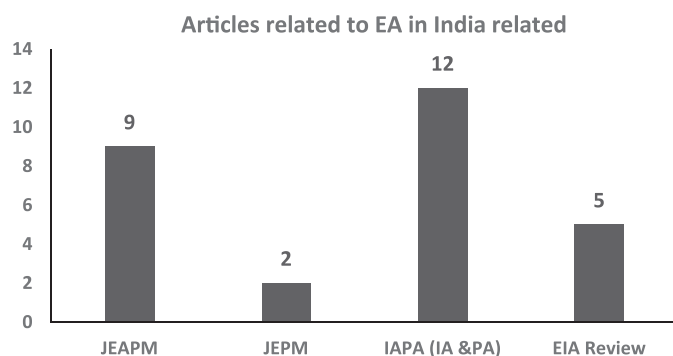


Fig. 1. Publications focussing on India in four EA related international journals (1986–2018).

2.3. Expert opinion

The analysis of the evolution of EIA in India is based primarily on the two sources of data collection mentioned above. However, the findings were further substantiated with the views of five EIA experts in India, which were collected in 2019 via interviews. To ensure a balanced representation the choice of the experts was intentionally varied to include views from consultancy, research institute, involvement within the ministry and academia. Furthermore, it was ensured that they had a sound reputation within the EIA system in India and were chosen with referral from known contacts in the Indian EIA community.

3. Evaluating the evolution of EIA in India

3.1. Completeness

3.1.1. Screening

Completeness refers to the 'breadth of activities that are subject to EIA' (Valappil et al., p. 81). One of the first questions to be explored in this category is the type of activities that require EIA to be undertaken or in other words how screening is done in EIA. The key framework legislation introduced in 1986 was the Environmental Protection Act under which 11 categories of projects required EIA to be carried out (Banham and Brew, 1996). The 1994 Notification made it mandatory for all projects listed in its schedule I, which included a total of 29 categories, to seek permission for development on the basis of an EIA. This process is known as Environmental Clearance (EC) in India (Jha-Thakur et al., 2009a). The number of categories was eventually increased to 32 with subsequent amendments and these projects were grouped under nine broad categories by sector. However, the threshold determining the requirement for EC was still based on the 'capital cost of the project' (Paliwal and Srivastava, 2012; Banham and Brew, 1996, p.198). As a result, EIA was not required for smaller industries with investments less than INR 1 billion. Eventually with the introduction of EIA notification of 2006, screening criteria of investment size was replaced by the capacity of the project. Furthermore, it also divided the projects under category A and B on the basis of capacity. Category A projects were required to be considered by the Central Ministry of Environment and Forest (MoEF) and category B is considered by the State Environmental Impact Assessment Agency (SEIAA). The latter is further classified as B1 and B2. B1 projects require EIA while B2 projects submit information based on Form-1 which in a questionnaire format requires information on raw materials, waste generation, environmental details of location along with emissions and effluents (MoEF, 2006). The number of projects enlisted keeps getting adjusted through amendments. However, it has been argued that the screening process does exclude many projects having significant environmental impacts due to them falling below a certain size. Hence, Rajaram and Das (2011) advocates that ecological carrying capacity should be the determining factor for screening. As far as expert opinion is concerned, three out of our five experts view that screening is achieved well in India, while one expert viewed it to be very well performed in India. According to one of the experts 'New sectors/categories of projects needs to be included for mandatory EIA' as it 'seems to be less effective particularly in case of sectors like real-estate/township development, roads and highways etc. in India'. Also, railways seem to be escaping the need of EIA requirements (MoR, 2020).

3.1.2. Scoping

Based on the EPA of 1986, Valappil et al. (1994) criticised the scoping stage for the lack of public consultation, lack of project specific approach and the reliance on subjective interpretation. Interestingly, scoping continues to face the same issues over the past 25 years. Based on the 1994 Notification, scoping was facilitated in EIA via a set of guidelines and review checklists (MoEF, 2001). The MoEF provided general questionnaires for all the sectors (Paliwal, 2006). Furthermore, the onus of identifying the key issue lies with the proponent and based

on the experiences, proponents are not diligent enough to take interest in identifying diverse impacts of their projects. Paliwal (2006) provides such an example of a project in an industrial estate of Haldia, which is located in the banks of the Hoogly river. The proponents in this case didn't estimate the impacts of their effluents on the ground water and nearby flowing river streams and the EIA reports got away with it 'saying that impact of their loadings would be negligible when compared with the quantum of flow in the river Hoogly' (p.15). (J). Based on the 2006 Notification, scoping is carried out for category-A and category-B1 projects through three stages, which include, (a) Application is filed by the proponent in Form-I along with pre-feasibility report and draft Terms of References (ToR) (b) MoEF/SEAC decides ToR for EIA (c) Intimation of final ToR to project proponent and display in website. This updated scoping process continues to suffer limitations as the proponents provide information in the prescribed forms, which acts as the basis for the ToR provided by the expert appraisal committees at the state and central level (Rathi, 2017). Our experts interviewed have divided views on scoping. While none of them rated scoping to be very well performed in India, three out of our five experts thought it is achieved to some extent with inaccuracies and gaps, one expert felt it is poorly performed while one thought this is not achieved at all. Public consultation still does not take place during scoping and in the words of one of the experts, 'key issues are generally not brought out' and the issues covered are 'generic'. This is evident in the EIAs of Nuclear power sector where the EIA reports make 'bland assurances' and have serious gaps with respect to including impacts (See Ramana and Rao, 2010, p.269). Furthermore, there is lack of ecological and socioeconomic indicators based on the comments of the experts.

3.1.3. Consideration of alternatives

Consideration of alternatives has been identified as a weakness within the EIA system throughout its existence in India (Paliwal, 2006; Khera and Kumar, 2010; Rathi, 2017). Most of the time its application is restricted to 'with project' and 'without project' scenarios (World Bank, 1999). The role of EIA in influencing the site selection and other activities associated with the planning stage, is usually limited (Ramanathan and Geetha, 1998). According to Paliwal (2006), one of the reasons for inadequate consideration of alternatives is owing to the fact that site clearance is conducted much before the environmental clearance process. The 2006 Notification has not really improved this situation as Rathi (2017) reports that alternatives are 'rarely' included in EIA reports and is merely used in justifying the project. The responses of the experts are not in agreement with regards to alternatives with two experts commenting, this is not really happening, one has chosen not to comment on this aspect, while one opines that this is happening with some omissions. However, one expert has also commented that 'alternatives are very well considered since review of three alternatives before finalising a project site is inherent in amended EIA legislation in 2006'. Overall, based on the comments received and the literature reviewed it can be concluded that in practice alternatives are considered merely as a tick box exercise without any serious considerations.

3.1.4. Mitigation measures

In the 1994 review, mitigation was pointed out as a weakness as they were suggested on the basis of compilation of data without considering interrelationships with other factors (Vizayakumar and Mohapatra, 1991). This weakness continues to exist in the 2006 Notification which only requires direct impacts of individual projects (MoEF, 2006). As Erlewein (2013) notes, this is especially problematic for hydropower projects as this form of power creation is becoming a leading source of energy in states like Uttarakhand and Himachal Pradesh (also see Rajvanshi et al., 2012), resulting in a series of cascading individual projects, which get away from the need of conducting EIAs. In addition to this, impact significance is not well understood or utilised within EIAs in India (Rathi, 2017). The feedback from our experts were quite consistent with regards to mitigation measures for which three of them opined that

this was poorly performed with gaps and inaccuracies and two experts felt that it was performed to some extent with inaccuracies. One expert commented that only 'generic mitigation measures are covered'. Similar view was shared by another interviewee with regards to the 'generic' nature of these measures which are usually incorporated as a requirement under the Environmental Management Plan (EMP) in the chapter on Anticipated Environmental Impacts and Mitigation. Hence, based on the interviews it could be concluded that the mitigation measures discussed in EIAs lack depth and are 'seldom comprehensive and all encompassing'. Also, mitigation measures on socioeconomic and cultural assessments are often neglected in Indian EIAs (Paliwal and Srivastava, 2012).

3.1.5. Availability of guidelines

Valappil et al. (1994) pointed out that lack of EIA guidelines is one of the main causes leading to poor quality of EIA reports. The MoEF plays the leading role in the preparation of guidelines while its Impact Assessment division is responsible for setting guidelines for the preparation of the EIA reports (Paliwal, 2006). The view on guidelines though seem to have changed for better. There are quite comprehensive guidelines available in India for preparing EIA reports (MoEF, 2001; Paliwal, 2006). Completeness of guidelines has been further investigated in the survey where more than 70% of the participants were of the opinion that Indian system has provided enough EIA guidelines which are of sound quality (see Fig. 2). The interviews with the experts further revealed a consistent opinion on this with four experts viewing this to be achieved with some gaps and one expert viewing that this is very well achieved. One expert claimed that: "Plenty of guidelines are available, however, someone has to use these and someone has to ensure that these are being used and that too properly".

3.1.6. EA's above project level and transboundary issues

The lack of EA above the project level was seen as a weakness within the EA system in India prior to the enactment of the EIA Notification of 1994 (Valappil et al., 1994). This weakness has been highlighted in subsequent reviews of EIA system in India post 1994 and 2006 EIA Notification (see Paliwal, 2006; Jha-Thakur et al., 2009a; Rathi, 2017). Strategic Environmental Assessment (SEA) has been recommended at policy and planning levels to facilitate better coordination amongst various government authorities (Paliwal, 2006; Lodhi et al., 2016). SEA has also been advocated to enhance the EA system in India and fill in current gaps by enabling the right options to be addressed at strategic levels (See Jha-Thakur et al., 2009a; Sainath and Rajan, 2015). In certain sectors, such as land use planning at a regional level, SEA's potential role in guiding lower level plans such as the master plan or zonal plans has been emphasised (Mukherjee and Rajvanshi, 2016). Furthermore, SEA has also been recommended to deal with non-environmental

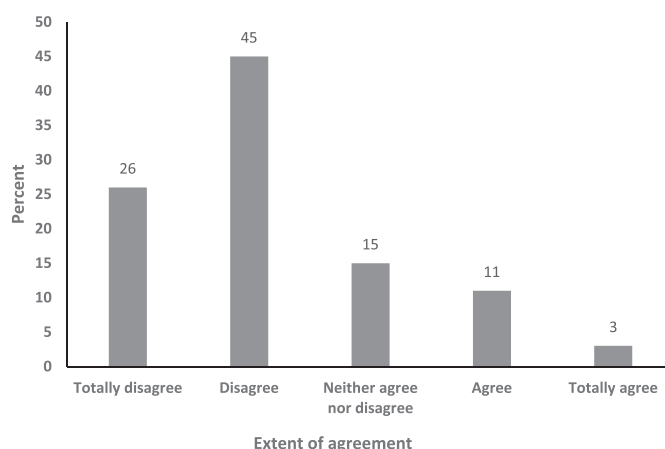


Fig. 2. The EIA guidelines require improvement.

issues such as employment and compensation which need to be considered at macro level (Paliwal, 2006). Currently EIA Notification of 2020 has been drafted and even this is silent with regards to SEA (Jha-Thakur and Rajvanshi, 2020). As far as transboundary issues are concerned, this is something which has not been discussed at all within the EIA system in India.

3.2. Open and public character

3.2.1. Public participation

During Valappil's et al., review (Valappil et al., 1994), public participation was not required to be conducted as part of EIA in India. Mandating public hearing by the enactment of Public Hearing Notification in April 1997 as an amendment to EIA Notification of 1994 was one of the major amendments (Rajvanshi, 2003; Paliwal, 2006) and was a turning point for public participation in the EIA system in India. In 2006, transparency of the process was further enhanced for e.g. the requirement to video record the proceedings was introduced. (Diduck et al., 2013). However, inadequacy in public participation has continued to be one of the commonly stated shortcomings of EIA in the country (Sinclair and Diduck, 2010; Agrawal et al., 2010; Rathi, 2017). For e.g. it is not carried out during the scoping stage but comes rather late and conducted on the draft EIA report arguably making it ineffective (Paliwal, 2006; Erlewein, 2013). One interviewee in this context claimed that: "Public participation is being held once the draft report is ready. As it is, this is too late a stage in the EIA process to serve the intended objective of EIA. Moreover, the issues generally raised in public hearings revolve around local employment and social infrastructure". Furthermore, it has been argued that project affected people do not get the chance to participate meaningfully in the public hearing process (Rajaram and Das, 2008). This view was emphasised by another interviewee who added that: *The public hearing, which is mandatory according to the EIA Notification is generally highly contentious and usually the civil society organizations and communities accuse the regulatory agencies of colluding with the project proponents to undermine the voice of the communities affected by the projects.*

3.2.2. Incorporation of local knowledge, values and needs

During Valappil's review, this was an underexplored aspect as public participation was not required and its base was embryonic. However, based on the 2006 Notification the public hearing process requires the views of all stakeholders to be ascertained for environmental impacts (MoEF, 2006). However, in case of India, public hearing concerns are dominated by socio-economic and development concerns with environmental issues being side lined (Sainath and Rajan, 2015). For certain projects at national level such as small hydropower projects of capacity <25 MW local knowledge and values are yet to be incorporated effectively at the state level approval process (Diduck and Sinclair, 2016). Out of our five experts, one couldn't comment on this, three opined that local knowledge, values and needs are being incorporated in public hearings to some extent with minor inaccuracies while one felt this was poorly achieved with too many inaccuracies.

3.2.3. Democratisation of decision-making

In the benchmark paper, EIA was not seen as an open democratic process as it lacked a mandatory requirement for public hearing (Valappil et al., 1994). Public participation is the most important way of introducing procedural democracy to the decision-making process (Aschemann, 2007; Khosravi et al., 2019a). However, even after mandating the requirement of public participation it was noted that this worked as a 'one-way flow of information from public to panel members with contribution made largely by vocal groups' (Rajvanshi, 2003, p.309). Furthermore, Rajvanshi (2003) noted that mechanisms of public participation were strategically designed to limit the influence, which people could have on decision-making. Public awareness has however considerably increased since the initial days of EIA in the country. For e.g. grass root level opposition against nuclear projects has been expressed

strongly through public consultation mechanisms within EIA (Ramana and Rao, 2010). However, there are also reports of complaints of non-compliance of the mandated proceedings for public hearing required of the EIA Notification 2006. These include, public not receiving copies of EIA reports or where the authorities have not read out the minutes of proceedings and sought consent from the public participating in the hearings (Ramana and Rao, 2010; Dilay et al., 2019). Other procedural problems exist such as public in remote villages having to pay for their own expense to attend the meetings imply significant burden for villagers (Sinclair and Diduck, 2010).

3.2.4. Transparency of the EIA process

Valappil et al. (1994) discussed EIA reports accessibility as another criterion in this category and stated EIA documents were treated as secret documents. Regarding the EIA process transparency, EIA notification of 1994 made provision for access to the executive summary of the project at the offices (Rajvanshi, 2003; Paliwal, 2006). Erlewein (2013) argues this has improved and the EIA process follows a clear process in India. One interview confirmed this by commenting on a web based, role-oriented workflow application called *PARIVESH*, which has been developed for online submission and monitoring of the proposals submitted by the proponents for seeking Environment, Forest, Wildlife and CRZ Clearances from Central, State and district level authorities. However, another interviewee added: "Although the regulation mandates access to EIA summary, it is difficult to obtain for ordinary public. The final decisions of the expert committees are publicly available but the nature of deliberations that led to approval or disapproval are not available making the transparency of the process questionable."

3.3. Objectivity

3.3.1. Expertise of people involved

Valappil et al. (1994) highlighted that the 'findings of the EI reports are mainly based on technical and scientific information' (p.83). This may be owing to the fact that EA related higher education in Asia and especially within India is mainly taught with the disciplines of engineering and natural science (Jha-Thakur, 2016). The survey result shows 34% of the EIA experts had technical and engineering background, and 62% with natural environment educational background. However, this educational background has shifted over time. For example, whilst respondents with over 10 years' EIA experience mainly had a Technical/engineering or natural environment background, those with less than five years' experience mostly possessed a Natural/Environmental studies background (Fig. 3). This shift can suggest that EIA is

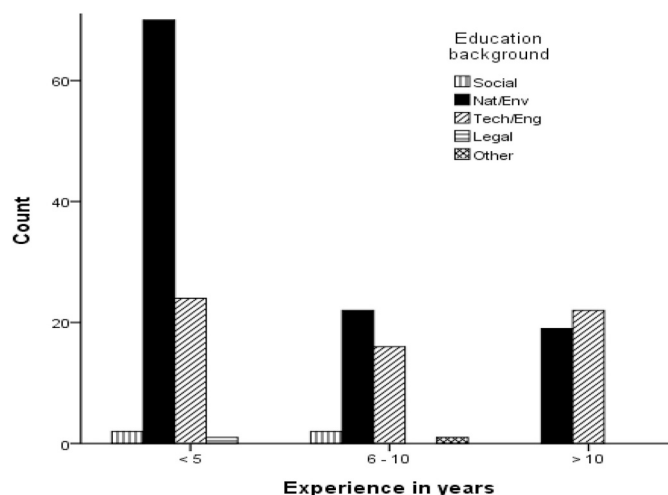


Fig. 3. Results from Cross-tabulating respondents' EIA experience in years and educational background.

increasingly engaging with multidisciplinary team, which is expected to enhance its effectiveness (Jha-Thakur et al., 2009b).

Paliwal (2006) stated that lack of expertise and limited human resources affect the quality of EIA reports and decision-making. A major step taken towards this has been the introduction of the scheme for accreditation of EIA Consultant organizations in 2015 by the Quality Council of India and its constituent board the National Accreditation Board for Education and training (NABET-QCI, 2020). This mandatory accreditation scheme has emphasised the need of multi-disciplinary EIA teams which has been supported with the prescription of educational qualifications that are required. None the less, when interviewees were asked about EIA human resources and their capabilities, one of them stated: “The Accreditation process for EIA consultants is in place...however, the expertise is variable and as the number of accredited EIA consulting firms is small, workload often dilutes the rigour and quality of inputs”. It was further commented that the professional expertise amongst people involved in EIA report proportion is still relatively small.

3.3.2. Independence with which people can work

Before the enactment of the 1994 EIA Notification, there was no independent expertise involved in preparation of the EIA report and political pressures influenced the EIA process and its overall quality control (Valappil et al., 1994; Banham and Brew, 1996). However, lack of independence continues to be cited as an issue in recent times. Within the nuclear sector, Ramana and Rao (2010), provided explicit examples where the appraisal committee reviewing the clearance process of the nuclear projects had members from institutes and organization that were involved in preparing the EIA reports themselves or were associated with the nuclear establishment. Within a similar context, Rath (2017), mentions that EIA proponents who pay for conducting EIA report downplay some of the impacts in the draft EIA report. This was endorsed by the interviewees. One interviewee claimed that “The project authorities hire the EIA consultants. The team of EIA consultants are therefore not completely independent and are likely to be influenced by the project proponents”. Another interviewee added that: “My perception is that most of the people follow the path of least resistance, which is a typical tendency of the majority in almost every walk of life”.

3.3.3. Credibility and Neutrality of the process

The points mentioned in the above paragraphs further affects the credibility and neutrality of the EIA process, which seems to be a persistent issue over the quarter of a century in India (Valappil et al., 1994; Paliwal, 2006). In the energy sector which hold a vital place in fuelling the economy of the country, concessions and exceptions prevail blanketing the sectors, which dilute the creditability and neutrality of the EIA process. For e.g. in 2005, the environmental appraisal committee for mining accorded EC to 20 mining projects in the same review meeting while in the nuclear sector the environmental appraisal committee suggested the proponents to carry out environmental impact studies and yet sanctioned the EC process without waiting for these studies to be conducted (See Jha-Thakur et al., 2009a; Ramana and Rao, 2010).

3.4. Verifiability

3.4.1. Efficiency of compliance monitoring

EIA follow-up and external inspection are often absent from the EIA process (Glasson et al., 2012; Khosravi et al., 2018), and this has been an issue within the EIA system in India (Valappil et al., 1994; Paliwal, 2006; Rath, 2017). In reviewing the 1994 Notification, Paliwal (2006) stated despite of a legal requirement and detailed guidelines on the monitoring procedure, there is a larger inadequacy in implementation of environmental management plans, mitigation measures and compliance monitoring in Indian system. Monitoring only takes place in response to complaints. The inefficiency of compliance monitoring was further confirmed) within the mining sector (Jha-Thakur et al., 2009a). Rath's

review of the 2006 Notification (Rath, 2017), stated similar findings and he stated that monitoring especially of ecological and social environment is rarely done in India.

3.4.2. EIA's influence on decision-making

The low influence of EIA on decision-making has been claimed frequently in the EIA system of India (Agrawal et al., 2010; Choudhury, 2013; Diduck et al., 2007, 2013; Nandimath, 2009; Paliwal, 2006; Erlewein, 2013). Valappil et al., (Valappil et al., 1994, p. 83) believed that “EIA reports do not have much influence on decision-making and decisions continue to be largely politically based”. However, based on our survey results the perception of influence of EIA on decision-making has changed compared to Valappil's review in 1994. When survey participants were asked to provide their opinion on the influence of EIA on decision-making, 36% of the respondents stated that EIA has led to the most environmentally friendly alternative. This is in contradiction to what we have found in section 3.1 when ‘consideration of alternatives’ was explored. The interviewees commented that this rather ‘positive’ outcome may be owing to the fact that at times, EIA reports provide alternatives, which are drastically negative when compared to the preferred alternative which is already pre-determined by the proponents. Hence, this ‘preferred alternative’ is made to look good by purposely providing environmentally unfriendly options. However, 30% of them thought EIA considers environmental values but does not lead to change, 26% were of the opinion that it had led to limited changes and 7% suggested that EIA had no influence on a project. Only 1% thought EIA has extensive influence change on decision-making. (See Fig. 4).

Interviewees found it difficult when we asked them about the influence of EIA on decision-making. One interviewee stated: “Question marks on EIA's influence on decision-making because adverse aspects invariably do not get reflected in EIAs”. However, one interviewee was quite confident that EIA is influencing decision-making.

3.4.3. Quality of EIS report

Most of the reports tend to be a compilation of data and this holds true from the initial review way back in 1994 to what has been suggested more recently as well (Valappil et al., 1994; TERI, 2002; Paliwal, 2006). Reviewing EIA reports is the leading responsibility of Impact Assessment division in MoEF (Paliwal, 2006). Rath (2017) considers EIA review mechanism as one of the weaknesses of India's EIA system and believes it is not robust enough to motivate consultants to prepare good quality reports. Out of five of our interviewees, four of them see it as a weakness while one perceives the quality to be achieved with some weaknesses. Based on the findings of our online survey 37% of participants viewed that the quality of EIA reports in India is good (Fig. 5). Nevertheless, Rath (2017) having reviewed more than 90 EIA reports concluded that reports are not effective and lack realistic impact assessment. The main

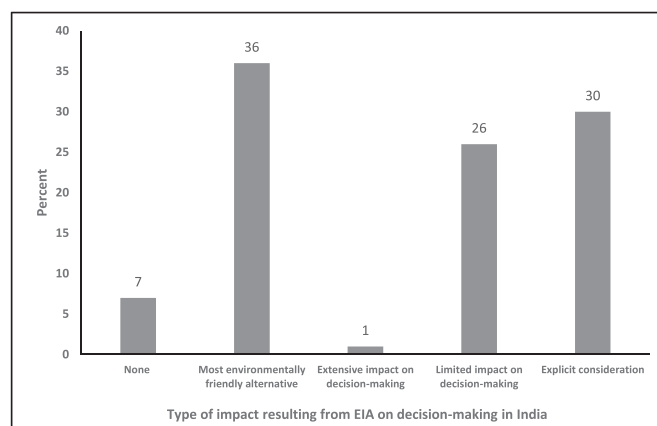


Fig. 4. Respondents' opinion on EIA's influence on decision-making (N = 176).

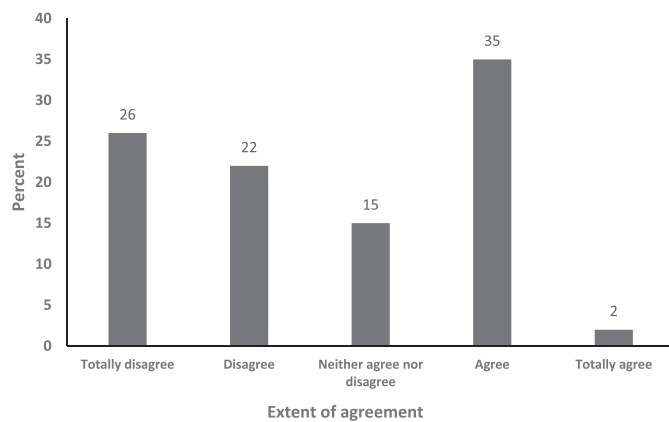


Fig. 5. Responses to the question of whether the quality of EIA reports is good.

reason for such inefficiency has been thought to be related to the role of the consultants who hold their allegiance to the proponents as they are hired by them.

3.4.4. Accuracy of predictions

Due to EIA being in its earlier days, the initial review of EIA system conducted by Valappil et al. (1994) identified that this was lacking within the EIA system. However, this continues to be a weakness in more recent times within the EIA system in India. For e.g. within the nuclear sector Ramana and Rao (2010) have reported how the EIA reports don't even consider significant impacts that are associated with nuclear projects such as impacts on health. Within the coal sector, consultants as well MoEF&CC have even committed the mistake of copy pasting impact predictions of underground mining in open cast coal mining EIA reports and conditional letters (Jha-Thakur et al., 2009a; Jha-Thakur and Fischer, 2008; Jha-Thakur, 2011). To some extent, accuracy of predictions is even impacted due to the lack of consideration of cumulative impacts which makes predictions in a piecemeal fashion (Erlewein, 2013). The interviewees are consistent with their perception regarding accuracy of predictions within EIA reports as they all consider this to be a weakness within the Indian system.

3.4.5. Effective implementation of mitigation measures

Valappil et al. (1994) commented that the implementation of mitigating measures was not taking place. Furthermore, later it has been identified that the effectiveness with which mitigation measures are implemented can differ regionally based on the pressure of development within the states of India. The capacity of the regulating agencies to check compliance is severely limited and hence they are compelled to set targets of how many industries can be reviewed by them annually (See Jha-Thakur, 2011). In addition to this, certain sectors such as the energy sector are critical for the economic development of the country and hence are powerful, which makes the regulating agencies not very effective in implementing strict measures (Jha-Thakur and Fischer, 2008). As such, even if there are reports of violation the State Pollution Control Boards and the MoEF&CC do not shut these violating units as they 'do not appear to have the power to enforce their regulation' (Ramana and Rao, 2010, p. 271).

4. Overview of strengths and weaknesses

Based on the performance of EIA in India over more than the last quarter of a century, it is evident that it has come a long way. Overall, EIA has made the most progress in the category of 'open and public character' though there is scope of further improvement. With regards to both categories of 'completeness' and 'objectivity' though some components have improved, overall these categories have severe gaps. However, with regards to verifiability, improvement is the least

significant and as such, this is where the EIA system is really deficient within the country. Performance within sub-criteria like screening, transparency and expertise of the people involved, has certainly improved. The dominant weaknesses within sub-criteria, which have repeatedly been highlighted since its inception include scoping, consideration of alternatives, application of EA above the project level that is the introduction of SEA and efficiency and accuracy of mitigation measures.

Shortcomings discussed above are common within other EIA systems, especially from developing countries (Khosravi et al., 2019b). Furthermore, issues such as weak alternative consideration in EIA process is a common weakness in both developed and developing countries (Jha-Thakur and Fischer, 2016; Kamijo and Huang, 2016). (Nadeem and Hameed, 2008) revealed similar deficiencies within the EIA process in Pakistan which included inadequate resource capacities, deficiencies in screening, scoping, ineffective public participation and absence of EIA follow-up. These are also inter-related issues and strengthening one can help in improving the other area of weakness. For e.g. as one of the experts commented '*no provisions are in place to cover landscape and visual impacts in the Indian EIA regulations. This is largely because the existing EIA process applies to individual projects and not to a series of projects in a landscape or an ecosystem*'.

In India, there has been a constant effort in revising the provisions of EIA framework and hence there has been several attempts of introducing a new Notification to this effect (MoEF&CC, 2009; MoEF&CC, 2019). With the economic meltdown in India, the emphasis of the MoEF&CC has been on 'faster clearances and stringent compliances' (Pradhan, 2020). However, the recent Draft 2020 Notification (MoEF&CC, 2020) that is being considered reflects serious shortfalls that aim in speeding up the EIA Clearance process without adequately strengthening its foundation. For e.g. it dilutes the screening and scoping process and though it claims it wants to enhance transparency in reality it has been argued that it actually dilutes it (Bindra and Rawat, 2020; Pradhan, 2020). Additionally, it requires the proponents to submit fewer monitoring reports without strengthening capacity building for compliance checking (See Pradhan, 2020; MoEF&CC, 2020). However, the development of EIA legislation in a country depends on the contextual factors such as the political system and economic situation as well as key actors' capacities (e.g. parliaments and the sector ministries) (Kolhoff et al., 2013). Therefore, further research on identifying contextual factors affecting EIA system is a precondition for providing a comprehensive prospect of EIA in India (Khosravi et al., 2019a). Nevertheless, considering learning lessons from the experiences of the last quarter of a century and taking inspiration from best practices to tailor down to the Indian context is essential.

5. 1 way forward for EIA in India: Recommendations

One of the most important aspect that needs to be highlighted on the basis of this study is the perceived added value of EIA in India. Fig. 4 reflects how EIA is having an influence on decision-making in India and this finding seems to be in alignment with similar studies conducted in other countries such as The Netherlands and The United Kingdom (See Jha-Thakur and Fischer, 2016; Arts et al., 2012). Hence, it is evident that EIA has been influencing decision-making to some extent and incorporating environmental considerations within it. However, suggestions have been put forward by various experts that EIA's role can be broadened to include a wider range of projects such as railways, which seems to be currently beyond its remit (Ministry of Railways, 2011). Furthermore, it should be broadened to be applied at a strategic level, for e.g. in national level urban reform initiatives such as the 'Smart Cities Mission' (Turaga et al., 2019). However, it is also observed that the expectation from EIA can grow too much to the extent that it can lead to a "mid-life crisis" (Jha-Thakur and Fischer, 2016, p.25). Hence, importance of the context within which it is being practiced needs to be considered in tailoring EIA.

If EIA is to be strengthened in India, we have four recommendations based on this study. First, step would be to enhance its scoping process and rather than adopting a standard approach, more effort should be taken to tailor made the EIA to cater to the significant impacts associated with it. As suggested by [Canter and Ross \(2014\)](#), the scoping process must involve all relevant stakeholders including the affected public and its content should include “an introductory section, background information on the potential project, logistics of the scoping process, press releases and announcements, and the process summary” (p. 21). Unfortunately, though, the EIA Draft Notification of 2020 dilutes the scoping process by raising uncertainty over the role of the appraisal committee in providing specific tailor-made terms of reference for the scope of the EIA projects and instead takes a generic and standard approach to it ([Bindra and Rawat, 2020](#); [Pradhan, 2020](#)). An efficient scoping process focused on the likely significant impacts, and not on the potential ones, joined with early public consultation would help to scope insignificant issues out, and is the key to achieving more proportional and effective EIAs ([Hansen and Wood, 2016](#)).

Secondly, the compliance mechanism and associated capacity building needs to be strengthened. Follow-up is usually the weakest link in EIA and India is not an exception to this ([Sadler, 1996](#); [Jha-Thakur, 2011](#); [Rathi, 2017](#)). Focus on the design stage of EIA follow-up can give more teeth to follow-up practices which would certainly add value to how EIA follow-up is currently undertaken in India ([Jha-Thakur et al., 2009a](#)). Furthermore, capacity -building amongst compliance officers in the regional offices of the MoEF&CC along with training and broadening of the review committees will strengthen the foundations. Once again, the 2020 Draft Notification requires the proponents to submit fewer monitoring reports without strengthening capacity building for compliance checking ([Bindra and Rawat, 2020](#)). Third, with regards to credibility and neutrality and, with regards to the independency of EIA review, The Netherlands is one of the few countries that have established an independent expert commission, the independent Netherlands' Commission for Environmental Assessment, who are in charge with quality review ([Arts et al., 2012](#)). Developing a neutral committee such as this, which does not appraise the environmental process neither writes the EIA report can add a certain level of objectivity to the EIA process in India and provide support to the stakeholders in enhancing the quality and know-how related to their work.

Finally, India's EA system is said to be 'myopic' due to its short sightedness and lack of incorporating a regional and cumulative approach in strategic decision-making ([Modak, 2019](#)). The need to introduce SEA has been emphasised in several articles over the years (see [Erlewein, 2013](#); [Bhatt et al., 2017](#)). Since 1994 ([Valappil et al.](#)), the lack of EA above project level has been cited as a weakness and yet more than 25 years later, the 2020 Draft Notification still fails to address this issue. With the lack of a mandatory SEA requirement, it is up to the critical sectors such as water and energy to adopt SEA to suit their needs ([Jha-Thakur and Rajvanshi, 2020](#); [Lodhi et al., 2016](#)). Hence there is a need for the uptake of SEA and develop capacity building and know-how regarding conducting EA above the project level. It should be noted that making SEA a mandatory requirement does not guarantee its effective implementation. Therefore, in order to strengthen the current EA system and introduce and increase the uptake of SEA, training and capacity building within sub-capacities, such as institutional capacity, resource capacity, organisational capacity, human capacity and technical capacity (See [Khosravi et al., 2019a](#)) is important. This should help in ensuring a steady and incremental shift towards enhancing environmental awareness and strengthening capacity development, which will allow the EA system to improve over time and eventually create a stronger foundation for SEA legislation to be introduced in the country ([Jha-Thakur and Rajvanshi, 2020](#)).

6. Conclusion

Based on the performance of EIA in India over the last quarter of a

century, it is evident that it has come a long way. Overall, EIA has made the most progress in the category of 'open and public character' though there is scope of further improvement. With regards to both categories of 'completeness' and 'objectivity' though some components have improved, overall these categories have severe gaps. However, with regards to verifiability, nothing has improved as such and this is where the EIA system is really deficient within the country. Performance within sub-criteria like screening, transparency and expertise of the people involved, has certainly improved. The dominant weaknesses within sub-criteria, which have repeatedly been highlighted since its inception include scoping, consideration of alternatives, application of EA above the project level that is the introduction of SEA and efficiency of mitigation measures. These are also inter-related issues and strengthening one can help in improving the other area of weakness. There has been a constant effort in revising the provisions of EIA in India and hence there has been several attempts of introducing a new Notification to this effect ([MoEF, 2009](#); [MoEF&CC, 2019](#)). However, the recent Draft 2020 Notification ([MoEF&CC, 2020](#)) that is being considered reflects serious shortfalls that aim in speeding up the EIA Clearance process without adequately strengthening its foundation (See [Pradhan, 2020](#)). In light of this, it becomes even more critical to learn lessons from the last quarter of a century and take inspiration from best practices to tailor down to the Indian context.

Declaration of Competing Interest

None.

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