

Environmental governance for addressing sustainable development goal for climate change

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Received: 24 October 2025

Revised: 06 February 2026

Accepted: 28 February 2026

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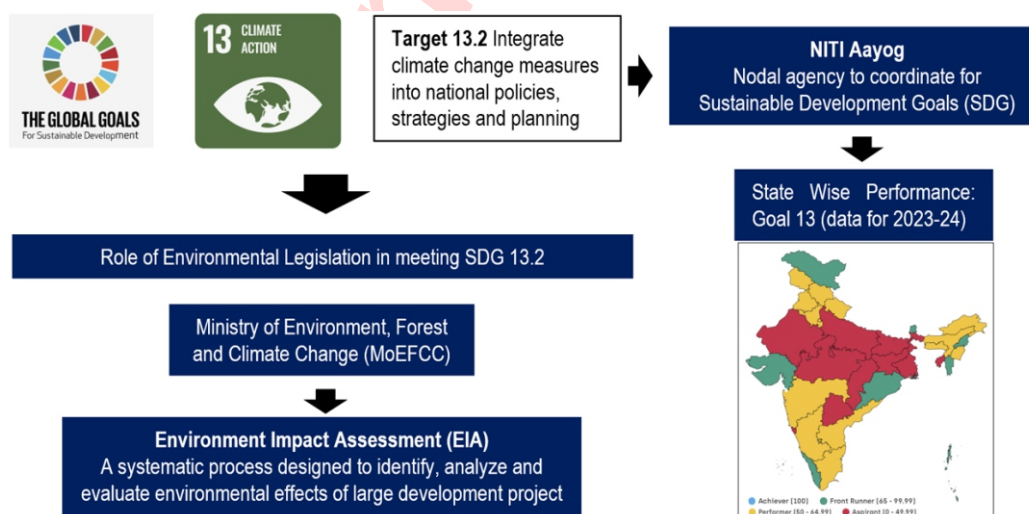
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Abstract

Sustainable Development Goal 13 for Climate Change and its component Goal 13.2 aims for countries to address climate change issue through governance. In this context, this research traces the journey of Indian environmental policy for climate action and examines the initiatives in India. The paper further explores the use of environmental impact assessment as a tool to achieve Goal 13.2. The study conducts a quantitative review of 270 environmental impact assessment reports through content analysis technique using a checklist and applying valuation criteria to explore application of climate change in practice.

83 of 270 reports were observed to include climate change criteria. This indicates a modest presence in climate-relevant content in conjunction with a temporal correlation with the State Action Plan for Climate Change (2017) for Maharashtra state. Overall, the link between climate change and environmental impact assessment was not critically established. The opportunity to address climate change through the existing framework for conducting an environmental impact assessment is highlighted through this study. The perspective that impact assessment is an important facet of environmental governance in India and can be directly aligned with Goal 13.2, extends beyond the conventional compliance-based understanding of an impact assessment.

Key words: Climate change, Environmental governance, Sustainable development goals



Introduction

The global purview towards environmental policies has developed rapidly since the 1970s when environmental issues began to gain importance and climate change began to be looked upon as a major factor demanding a requirement for reform in environmental governance (Abbass *et al.*, 2022; Malalgoda *et al.*, 2014). In 2014, the Intergovernmental Panel on Climate Change (IPCC) released its Fifth Assessment Report (AR5) which focuses on the strategies for mitigating climate change (IPCC, 2014). Through its report, the IPCC confirmed that impacts on the environment; natural, as well as manmade, are a reality which will happen sooner or later and as concluded by Stoerk *et al.* (2018), some of these impacts would as well be unrepairable, making it difficult to look for solutions through policies and regulations at an advanced stage. Thus, a focus on climate friendly development is the need of evolving urban and environmental policy (Temmer, 2017). In 2015, with the establishment of the Sustainable Development Goals (SDG), the United Nations Framework Convention on Climate Change (UNFCCC) aimed to focus on reducing the pace of climate change for a green and environmentally resilient future through different goals (UNDP, 2015).

The SDGs, also portrayed as the 'Global Goals' by the Division for Sustainable Development Goals (DSDG) of the UN, provide a guideline for all the member states to frame their respective development policies over the next 15 years (United Nations, 2023). Through its sub-component Goal 13.2, the aim of incorporating the action for climate change protection into governance is broadly established, however, there is no framework for applying the goal in national policies (Fuldauer *et al.*, 2022; Sami *et al.*, 2000). As observed by Alberti and Susskind (1996), sustainable development as a planning process collectively with impact assessment, is recommended as a critical instrument for accomplishing climate change mitigation. International climate change agreements like the UNFCCC through its Article 4 (f) and the Kyoto Protocol through Article 2.3, 3.14, 12.3a, 12.5, 13. 4a indicate that the Environmental Impact Assessment "can and should play a role in tackling climate change" (Sok *et al.*, 2012). Various studies have indicated the potential of the Environmental Impact Assessment (EIA) as a measure for reducing greenhouse gas (GHG) emissions, citing examples from the developed countries and their respective environmental policies with regards to EIA (Agrawala *et al.*, 2011; Ohsawa and Duinker, 2014; Yi and Hacking, 2012).

Mayembe *et al.* (2023) provide further examples from the Caribbean, the South Pacific Islands, Western Australia, the UK, and Ireland. Literature also indicates substantial variability in the integration of climate change mitigation within impact assessment procedures (Hetmanchuk, 2020). However, in the Indian context, there is no previous assessment of the modalities of the EIA as a planning mechanism to meet climate change vulnerabilities within the background of environmental governance. This research seeks to address the gap in assessing

the ability of the EIA as a mechanism to fulfil SDG 13.2 meant to integrate measures for tackling climate change in the context of environmental governance within India. The study is based on document analysis of EIA studies carried out within a defined jurisdiction through a dataset of 270 EIA reports. By linking document-based evaluation with the trajectory of India's environmental policy, the study identifies concrete gaps between regulatory intent and on-ground practice, offering original insights into the role of EIA in mainstreaming climate change within the environmental governance.

Materials and Methods

A sample of 270 EIA reports for projects from the state of Maharashtra was referred for the assessment. Maharashtra state was selected for the sample study due to its progressive economy. The reports prepared for environmental assessment were selected randomly by accessing open-source data from the PARIVESH portal which is a web-based initiative by the Ministry of Environment, Forest and Climate Change (MoEFCC). Environmental assessments carried out for large infrastructure and industrial projects contributing to significant localized climate impacts were considered. The data set took into account reports prepared after 2015 to analyze the influence of the National Action Plan on Climate Change (NAPCC), which was announced by the Government of India in the year 2015.

The analytical work to understand the incorporation of climate change issues in an EIA supporting the research is founded on the checklist-based review of a sample of EIA reports. A review checklist of selected valuation criteria and content analysis technique was used for the assessment (Table 1). Content analysis was carried out using simple search tools of Adobe. Though checklists have been used in the past to assess EIA studies (Barker and Wood, 1999; Wolfgang *et al.*, 2012), still there is a scope for amendment (Petts, 1999), and improvising them based on the uses and type of evaluation is possible. Thus, valuation criteria compliant to this study were adopted based on the climate change mitigation policies (OECD, 2015), guidelines for incorporating climate change considerations in assessments (Government of Canada, 2003), and Strategic Environmental Assessment Guidelines (UK Climate Change Risk Assessment: Government Report, 2012).

The following valuation criteria were developed for this study based on the available checklist: Climate change; Energy conservation measures; Heat Island Effect; Carbon footprint mitigation; Life Cycle Assessment (LCA); Disaster management; Green area and Monitoring Plan. Further, the study limits itself to the availability of EIA reports in the public domain available as open source and is restricted to a sample of 270 randomly selected reports. An additional constraint faced by this research is that the study focuses on EIAs from one state, whereas a regional comparison across a range of states could provide a comparative assessment across multiple jurisdictions, representing the overall scenario of India.

Table 1: Categories of analysis based on issues related to climate change

Stage of EIA for considering climate change issue*	Evaluation criteria (as per checklist)
Scoping	Mitigation Adaptation Opportunities
State Goals	Level of achievement
Regional Scale Goals	Level of achievement Methods for regionalization
Mitigation addressing Climate Change	Avoidance Reduction Off setting
Adaptation addressing Climate Change	Strategies Objectives/ Goals Factors Indicators Climate Change Targets
Alternatives to Climate Change	Content based Spatially significant
Climate Change and its relation	With Biodiversity With Energy With Socio Economics
Sectoral planning contents	-
Monitoring Plan	-
Local Participation	-
Cumulative Impacts	Due to the project On the project
Quantification of Impacts	Large/ small
Nature of Impacts	Affects over long period/ short period

Source: Wolfgang *et al.* (2012)

Results and Discussion

Prior studies have shown that among the developing countries, India is one of the largest growing economies and the third largest issuer of global emissions (*Global Carbon Atlas*). Although the government has made several commitments for GHG reduction, these have been on a voluntary basis and were most commonly supported by local initiatives to mitigate the impacts of climate change (Thaker and Leiserowitz, 2014). Also, due to the changing nature of greenhouse gas emission in India, the contributions to address climate change has been portrayed through various international policies implemented by the Indian government. In 2009, India had voluntarily set a goal for achieving reduction in the intensity of its GHG emissions by 20 to 25% by the year 2020 as compared to the year 2005. This was despite the fact that the government of India had no binding under the UNFCCC (Thaker and Leiserowitz, 2014), however, as a result of this commitment, its carbon emission target reduced by about 24% of its GDP between the year 2005 and 2016. Further in 2015, India officially pledged its Nationally Determined Contributions (NDCs) to UNFCCC under the Paris Agreement.

For tracking the state wise achievement of Sustainable Development Goals, the NITI Aayog of India has set category-wise Index Score. As per the criteria set by the UN for the year 2030, when compared to the national target set for 2030, a state

falls in the category of an Aspirant, Performer, Front-Runner or Achiever if it has achieved the pre-defined score. Performances of the States and Union Territories are categorised as follows: Aspirant: 0–49, Performer: 50–64, Front-Runner: 65–99, and Achiever: 100 (*SDG India Index*, 2018). Of the five indicators for SDG 13 which were studied, the data for the indicator tracking the renewable energy usage for the year 2020 shows that India ranks high (36/40) from the previous score (17.5/40) of 2018. Score on all other indicators: disaster preparedness, savings on CO₂, loss of life due to extreme weather and pollution show a scope for a lot more efforts to reach the set targets. 2023-24 editions of the Index indicate that India is now the 'Front Runner' category (a score between 65–99). For Goal 13, India has shown the most extensive development leading to upgradation - with its score growing from 54 to 67 (Table 2). Factors contributing are disaster preparedness, use of renewable energy for electricity generation, compliance of industries with environmental standards.

However, the performance of the States /Union Territories on the SDG India Index Score, indicates that no State or UT falls under the category 'Achiever'. Within the remaining categories, there are 24% Front Runners, 41% Performers and 35% Aspirants (NITI Aayog, 2021). Maharashtra's progress on the SDGs reflects a positive trajectory. In the composite SDG India Index 2.0, the state was placed in the "Performer" category with an index score of 64, reflecting moderate advancement across

Table 2: Key findings for Goal 13

Finding	
SDG India Index score	increased from 54 (Performer category) in 2020–21 to 67 (Front Runner category) in 2023–24
Disaster preparedness score	19.20 (as per Disaster Resilience Index)
Renewable energy share	improved from 36.37% (2020) to 43.28% (2024)
Industrial compliance	94.86% of industries adhere to environmental standards

Source: SDG India Index

Table 3: Output data using Valuation criteria

Valuation criteria	Occurrences
Climate change	7 (2%)
Energy conservation measures	16 (5%)
Heat Island Effect	7 (2%)
Carbon footprint mitigation	12 (3%)
Life Cycle Assessment (LCA)	37 (11%)
Disaster management	60 (17%)
Green area	64 (18%)
Monitoring Plan	143 (41%)
Total occurrences	346

key social, economic, and environmental indicators. The state's performance further improved considerably in the subsequent assessment. According to the SDG India Index 3.0, released in June 2021, Maharashtra's score had increased from 64 in 2019–20 to 70 in 2020–21, elevating it to the Front Runner category. This improvement signifies enhanced implementation of sustainable development policies and greater institutional alignment with national priorities. The upward trend highlights Maharashtra's growing commitment to integrating sustainability into governance frameworks and addressing critical areas such as renewable energy, disaster preparedness and environmental management.

A quantitative review of 270 environmental impact assessment reports was conducted through content analysis technique. The outcome of the assessment revealed that only 83 out of the 270 EIA reports mentioned the issues directly based on the climate change criteria. In these reports, the aggregate occurrences of the valuation criteria were observed to be 346 (Table 3). The assessment further revealed that the studies pertaining to carbon footprint analysis, heat island effect, life cycle assessment (LCA) which pertain to the impact of individual projects on the surroundings, and are directly ascribed to climate change, cover about 16% of the sample analyzed for the study. The inclusion of disaster management plan, provision of mandatory green belt and proposal for monitoring plan for implementation which are perceived significant criteria with regard to climate change action, were observed in 60, 64 and 143 occurrences each, respectively, and were cumulatively at 76%.

To understand the environmental legislation in India and its role in meeting SDG 13.2, it is necessary to understand the

responsibility accorded to various agencies appointed for achieving the goals. Based on the work on domestic climate policy of India by Sami *et al.* (2017), it is learnt that the Government of India appointed the National Institution for Transforming Urban India (NITI Aayog) in 2015, as the apex agency to coordinate for achieving the targets set by SDGs. NITI Aayog was initially Planning Commission and has worked in coordination with the Ministry of Statistics and Programme Implementation (MoSPI) and other Ministries, for developing indicators for meeting the goals and targets defined in the UNFCCC SDG agenda. Through a "mapping exercise that had been undertaken to identify specific ministries for individual goals and targets" (Sami *et al.*, 2000), the Ministry of Environment and Forest and Climate Change (MoEFCC) was identified as the agency which would serve as the nodal ministry for working towards the achievement of Goal 13 (NITI Aayog, 2021). The items of work allocated to the MoEFCC include domestic policies as well as climate change and consultation with the UNFCCC in matters related thereto. Significant to note here is that in May 2014, as climate change began to get prioritized, the Ministry, which went by the name of Ministry of Environment and Forest (MoEF), was changed to Ministry of Environment, Forest and Climate Change (MoEFCC).

Analysis of the sampled dataset indicates that details pertaining to measures for energy conservation, use of renewable energy sources and adopting reuse and recycling mechanisms can be observed in the EIA studies carried out from the year 2017 onwards. Though the contribution of these studies in the overall output is not significant (5%), it can be attributed to the SAPCC prepared for the state of Maharashtra (TERI, 2017). Existing research demonstrates that there is no strict framework for the climate related policies in the present governance system and its application in the environmental legislation is unclear (Dubash and Jogesh, 2014) although climate change is a mandate of MoEFCC. Based on the same principle, no significant change was observed in the procedure for integrating methods for tackling climate change aspects in any of the sampled reports post the year 2017. This fact is also supported by the observation pertaining to the mention of the term 'climate change' in the actual context of mitigation strategies as part of the EIA which was observed in 2% of the assessed samples.

A review of the existing literature also shows that the initial environment related policies of India were strongly guided by

global agreements concerned with the environment. Successful interventions of more developed countries as well as their experiences in handling matters related to the environment also helped in shaping the environmental policy of India (Atteridge *et al.*, 2012). In the year 2006, India established its National Environment Policy (NEP) for environment which is inclusive of the climate change agenda. Through the NEP, the Indian Ministry for the first time spoke about reducing the GHG emissions of the country. As noted by Atteridge *et al.* (2012), in the year 2010, post the Council of Parties (COP16) meeting under the UNFCCC, India established its own climate change goals.

Climate change policies in India are focused on combining the development and climate agenda (Dubash and Jogesh, 2014; Revi *et al.*, 2014), and the first step taken by the Indian government on climate change after the NEP, was the National Action Plan on Climate Change (NAPCC), 2008 (Atteridge *et al.*, 2012). The NAPCC, besides providing a framework for addressing climate change issues, as pointed out by Atteridge *et al.* (2012), also promoted the economic development. The NAPCC, thus, primarily marked a directional shift in the country's environmental and development policy whereby goals for climate change action were interdependent of larger developmental goals (Byravan and Rajan, 2013). While the NAPCC was initiated in 2008 as a response to international discussions, the eight missions that were outlined in it focused on the requirements of internal development needs of India. These missions focus broadly on the environmental segments for creating a base on which long term planning for achieving the national goals on climate change could be overlaid.

While the government of India framed environmental governance mechanisms to encompass climate change, the centre directed the state governments to further the cause of the NAPCC through the State Action Plan on Climate Change (SAPCC). The policies within the SAPCCs in respective states were proposed to be developed to meet the requirements of eight NAPCC missions, with a view to decentralize the eight missions beyond the national level and upgrade the state agenda to satisfy them (Gogoi, 2017). With climate change being perceived as a challenge for urban growth and development by governments, the SAPCCs focused on sustainable development strategies integrated with climate change action plans within the program for urban growth specific to the state (Gogoi, 2017; Kumar, 2018). As of 2022, 34 states and union territories in India had prepared their respective SAPCCs as per the National Steering Committee on Climate Change (MoEFCC, 2019). With a basis of the primary objectives defined by the NAPCC, the state proposals for climate action began to indicate potential to fulfil the sustainability goals with respect to the climate agenda (Gogoi, 2017). Furthermore, the responsibility for framing and implementing climate policy at the state level lies with different institutions (Atteridge *et al.*, 2012) like Department of Science and Technology or Pollution Control Boards or the state environment department. It may be noted here, that differentiating implementing agencies varyingly influence the climate policy in different jurisdictions (Sami *et al.*, 2000).

The study, thus, highlights that despite mandates, substantive integration of climate change remains weak, pointing to a gap in procedural effectiveness. Although, the overall figures obtained as an output of the analysis reveal very poor interface of climate change and EIA, the important aspect that emerges is reimagining the EIA process as a tool for climate governance in India, and its contribution beyond the conventional compliance-based understanding of EIA. Assessment methodologies supporting GHG mitigation policies applied to policies, programmes and plans can be integrated into the Environmental Assessment process (Hetmanchuk, 2020). A similar study by Mayembe *et al.* (2023) of 19 EIA regulatory systems across the world, built on levels of 'climate change based' EIA, indicate varying reference to regulations and guidelines on climate change impacts. Moving forward, the EIA in India may also be looked at as an approach to regulation pertaining to environmental in the light of SDG 13.2. A cross section of data sets across different states and jurisdiction, covering a wider time frame which is well beyond the state's climate action plan, may provide further insights into the achievability of an EIA study to meet climate goals.

Conclusively, the study establishes that while climate change integration in EIAs found in India is limited, the impact assessment process itself holds potential to address climate goals, if strengthened. The findings of this study suggest using EIA as a tool for environmental governance, aligning it with SDG 13.2 and UNFCCC targets. A broader analysis, across multiple states and extended time frames, is recommended to assess the true potential of EIA in advancing climate action.

Acknowledgment

This study has been made possible by accessing open source data from the PARIVESH portal (<https://parivesh.nic.in/>) which is a web-based initiative by the Ministry of Environment, Forest and Climate Change (MOEFCC), developed for assessment of projects submitted through an online system for environment clearance to be obtained from the Ministry. The portal enables the Ministry to further monitor the projects for environmental compliance.

Authors' contribution: B. Pharate: Conceptualization of idea, secondary data gathering and writing the draft paper; V. Ramanathan: Appraisal and reassessment for finalization of paper.

Funding: Not funded.

Research content: The research consists of original ideas and has not been published earlier.

Ethical approval: The research is carried out with due permission from the Institutes Ethical Committee for collecting data.

Conflict of interest: The authors hereby confirm that there is no

conflict of interest.

Data availability: Open data is referred.

Consent to publish: All authors hereby provide their consent to publish the paper in *Journal of Environmental Biology*.

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