

Sustainable Elections in India: Environmental Impacts and Pathways for Green Democracy

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Abstract—For any democratic governance, elections are fundamental. In our country India, presently the entire electoral process still involve significant environmental costs. Through this paper an attempt has been made to examine the concept of “sustainable elections” in India. Sustainability has been judged based on the ecological footprint of electoral processes that include campaign materials, transportation, energy use, and digital infrastructure. Through this paper, an evaluation of the initiatives by the Election Commission of India to promote eco-friendly practices has also been done and analysis of challenges of political incentives and enforcement gaps also be made. The study logically judges the necessity of integrating sustainability into electoral systems for the alignment of democratic practices with environmental goals.

Keywords— sustainable elections, green democracy, India, electoral reforms, environmental impact

I. INTRODUCTION

Present electoral system of India dates back to ancient history and polity of India. During Vedic Age though the Kingship was often hereditary, but the king had to be approved or accepted by the people or assemblies. The Vaishali is considered one of the world’s earliest republics, associated with the Licchavi clan, where the Governance was republican i.e., Gananajya, leaders were elected or selected by an assembly, the assembly was called the Gana Sabha. Emperiarism of Kalinga and Magadha and golden era of Guptas and Mauryas are the other examples. The Supreme Court in the case of Lakshmi Charan Sen v. Akm Hassan Uzzaman, AIR 1985 SC 1233 described the election as "oasis of democracy". The masterly words "DEMOCRATIC REPUBLIC AND WE THE PEOPLE OF INDIA" in the PREAMBLE of our noble Constitution are enough to co-relate election of public officials with the people of India. In each and every country election and its process is the running stone behind the Democracy. The concept of democracy, as visualised by the Constitution, presupposes the representation of the people in

Parliament and State Legislatures by the mode of election.

Under the supervision of the Election Commission of India our country conducts the largest elections in the world. This election process involves millions of personnel, vast logistics, and extensive campaigning. Every five years, the voters exercise their franchise, creating the largest democratic exercise on the planet. But behind this celebration of democracy there is a challenge which is a big concern of the present days, i.e., the environmental cost of elections. Plastic banners, synthetic flex boards, paper waste, and the carbon footprint of massive campaigns together leave a surprising ecological impact. While elections strengthen democracy, they also generate substantial environmental impacts.

As per the report by The Energy and Resources Institute (TERI), in 2014 General Election an estimated 8,000 metric tons of non-biodegradable waste was generated. In 2024, the Election Commission of India strengthened its push toward “green elections” where a set of sustainability guidelines was aimed at reducing the environmental impact of campaigning and election management (Election Commission of India, 2024). But no comprehensive national estimate has yet been officially published for the 2024 elections.

The ECI encouraged biodegradable banners and posters, recycled paper for pamphlets and voter slips, natural or reusable materials for stage setups and decorations. The aim is to reduce solid waste generation, pollution from PVC and synthetic material. Political parties were encouraged to use social media, websites, and digital outreach, reduce reliance on printed posters and pamphlets. The Commission also promoted minimal paper use in electoral processes like voter lists and documentation, emphasis on the use of energy-efficient lighting and sound systems at rallies,

minimizing excessive use of loudspeakers (also linked to noise pollution norms), reducing fuel consumption in campaign logistics to lower down the carbon footprint of large-scale election rallies. Political parties and candidates were advised to avoid single-use plastics such as plastic banners, flex boards, hoardings, disposable cups, plates, and packaging materials. The concern is that such materials are non-biodegradable and create massive waste during elections.

Even though the Election Commission of India (ECI) has begun promoting environmentally responsible practices, but sustainability remains a secondary concern in electoral planning. This paper tries to explore how elections can be made environmentally sustainable without compromising democratic participation.

II. OBJECTIVE OF THE STUDY

The crossway of elections and sustainability is relatively new. The studies on political ecology highlight how governance systems influence environmental outcomes (Dryzek, 2013). Research on campaign practices (Gulati, 2018) indicates heavy reliance on printed materials and fossil-fuel-based transportation. Recently discussions are going on in favour of “green elections,” with a pinpoint focus on reducing waste and emissions as the reports suggest that campaign-related plastic waste and vehicle emissions are major contributors to environmental degradation during elections.

The Election Commission of India has introduced several advisory measures. These measures includes discouragement of plastic banners and flex boards, promotion of digital communication, encouragement of eco-friendly campaign materials. Though all these measures supports “pollution-free elections” initiatives by the Election Commission of India, however, these are mostly guidelines rather than strict laws. Despite increasing awareness about environmental sustainability, electoral processes in India still continue to generate substantial ecological costs in the form of plastic waste, carbon emissions, and excessive resource consumption. Some fragmented initiatives had taken place in this regard, such as plastic bans in Kerala and eco-friendly polling booths in Goa. But these efforts are inconsistent across regions. Moreover, there is limited standardization in the implementation of

green election practices. Enforcement mechanisms are also weak.

A comprehensive national framework for sustainable elections is absent in our country. Additionally, political will and public participation varies. And this is raising a question about the scalability and long-term effectiveness of such initiatives. What is needed is the critical examination of the extent and challenges of green election practices in India to understand the impact of environmental footprint of green election practices.

Present literature and the policy discussions on elections in India have largely focused on political participation, electoral reforms, and governance. There is a very little attention to environmental sustainability. There also a lack of comparative analyses across states and electoral contexts, quantitative assessments of environmental impact reduction, integration of sustainability frameworks into electoral policy studies, examination of behavioral responses of political parties and voters. This indicates a clear gap in systematic, interdisciplinary research that connects environmental sustainability with electoral governance in India.

The present study aims to explore and evaluate the concept of green elections in India through the following objectives:

- i. To examine the concept and significance of green elections within the framework of sustainable development.
- ii. To analyze key initiatives and case studies of environmentally sustainable electoral practices in India.
- iii. To assess the environmental impact of traditional versus green election practices.
- iv. To identify the challenges and limitations in implementing green elections across different regions.
- v. To suggest policy recommendations for institutionalizing sustainable practices in India’s electoral system.

III. SIGNIFICANCE OF GREEN ELECTION WITHIN THE FRAMEWORK OF SUSTAINABLE DEVELOPMENT

A green election means to conduct elections in a way that minimizes environmental impact along with

promotion of ecological awareness. green elections play a meaningful role within the framework of Sustainable Development. It is an initiative of alignment of democratic processes with environmental responsibility.

As it is evident that traditional elections involve paper ballots, posters, banners, plastic materials. All these transformed into a large amounts of waste after the election process. Moreover transportation emissions during election campaign also cause air pollution. Here the initiative of green elections can help us to reduce all these wastes by the adoption of digital campaigning instead of printed materials, promoting eco-friendly inks and recyclable paper, reducing the use of single-use plastics at polling stations. This directly supports sustainable development's goal of conserving natural resources.

Green elections encourage political parties and candidates to adopt environmentally conscious practices which resultantly may help our nation to comply United Nation's Sustainable Development Goals (SDGs). Further, this may reinforces accountability and integrates sustainability into governance. When elections are conducted in a green manner, voters become more aware of environmental issues, climate change, conservation, and sustainable policies. This may ultimately encourage citizens to prioritize these concerns in their personal life decision-making.

Electronic voting systems, online voter awareness campaigns, and energy-efficient polling infrastructure are the main pillars of the green elections. These modernize electoral systems helps in reducing carbon footprints and thus embedding sustainability into such a fundamental democratic process. Green elections help in creating a culture where environmental responsibility becomes a norm across all sectors—not just during elections.

Green elections are more than eco-friendly voting. Green election integrates environmental ethics with the democracy of a nation. By reducing ecological damage, breeding awareness, and promoting policies that balance present needs with future generations' well-being green election establish sustainable development.

IV. REAL-LIFE CASE STUDIES OF ENVIRONMENTALLY SUSTAINABLE ELECTORAL PRACTICES IN INDIA

Elections in India is the world's largest democracy. This is logistically a complex exercise that involves millions of voters, extensive campaigning, and large-scale deployment of materials and infrastructure. All these processes are essential for democratic functioning. But the problem is that they also generate significant environmental externalities such as single-use plastic waste used in banners, hoardings, and other campaign materials, carbon emissions etc. Recognizing this issue, in recent years, the concept of "green elections" has emerged as a response to these challenges, aiming to integrate sustainability into electoral practices. In recent past times an urge for the circular economy principles within the electoral management practices is evident.

Regulatory and judicial interventions have played a crucial role in this respect. For instance, in the state of Kerala, during the 2019 general elections some proactive measures such as, discouraging plastic use and promoting biodegradable alternatives, had been adopted with a support by directives from the Kerala High Court. Included. These efforts supports the influence of institutional frameworks on environmentally responsible political behavior (Drishti IAS, 2024).

To make the physical infrastructure of elections green some other important efforts have also been made. E.g. in Goa 2022 assembly elections, eco-friendly polling booths were constructed using biodegradable and locally sourced materials. This initiative on one way reduced the ecological footprint of polling stations at a significant scale, and on the other way, provided financial support to the local artisans. This initiative reflects an alignment of environmental sustainability initiative with socio-economic benefits (Drishti IAS, 2024). During the 2024 general elections, one initiative has been taken in the Anandpur Sahib constituency of Punjab to shift toward a carbon-neutral framework. Efforts were made to minimize plastic usage. Tree plantation drives were aimed at carbon offsetting. Such initiatives reflects the broader scope of green elections (Grant Thornton, 2024). In the recent years, technological interventions have also significantly contributed to reduce the environmental burden of elections. The nationwide introduction of Electronic Voting Machines (EVMs) in the election process has curtailed the need for paper ballot and thus reducing deforestation by conserving large quantities of paper and. So, digital innovations actually enhanced both

efficiency and sustainability in electoral processes (NDTV, 2024).

In the State of Telangana, during recent elections from 2024 to 2026, experimental models of Green Polling Booths or 'Haritha Polling Stations' has been actively implemented. The basic objective behind this initiative was to promote environmental awareness and waste management among voters through showcasing the practices like waste segregation and recycling¹. These booths were notable in the districts Warangal, Sangareddy, and Rajanna Sircilla and these were designed around themes of plastic recycling, solid waste management, and sanitation. Polling stations were decorated using eco-friendly materials, greenery, and banana leaves, not with PVC flex banners. Some specific areas were used for displaying messages of stop using single-use plastics and to adopt '3R'- Reduce, Reuse, Recycle practices for voters. In Warangal district, discarded plastic bottles were arranged to create artistic displays with the theme "Waste to Wealth". The booths were decorated with potted plants and coconut leaves, provided water in earthen pots, and featured "green selfie points" to encourage voter participation in the initiative. Up-cycled materials have been used as election logistics in the Ernakulam districts (The Times of India, 2026).

Along with all these institutional efforts, civil society organizations and citizen groups are increasingly advocating for environmentally responsible elections. Various campaigns in urban centers like Kolkata and Chennai have taken place. The theme of these campaigns were plastic-free election campaigning and digital outreach. This is obviously an indication of a broader societal shift towards sustainability in the democratic practices (The Times of India, 2024).

All these facts and figures established the fact that the election process in India is gradually evolving towards green election. Green election is no more an isolated initiative, rather it became a broader policy

and governance discourse. Even though challenges such as enforcement, scalability, and behavioral change among political actors remain, still India continues to refine its electoral processes by integrating it with sustainability principles as because it is our realization that democratic practices must not come at the cost of environmental degradation.

V. ENVIRONMENTAL IMPACT OF TRADITIONAL VERSUS GREEN ELECTION PRACTICES

Elections in India generally require massive logistical operations that involves materials, transportation, and energy use. And all these obviously generate significant environmental externalities. From this issue of environmental externalities the concept of green elections has emerged. In the recent elections, several initiatives has been adopted to align the electoral processes with sustainability principles.

The past elections in our country India where the number of electorates are too large, millions of printed materials were produced during each election cycle. The electoral process were heavily relied on printed ballots, voter slips, posters, and pamphlets. This leads to deforestation and high water and energy consumption in paper production. Campaign materials such as banners, flex boards, and flags are often made from non-biodegradable plastics. After elections, these materials are frequently thrown-away irresponsibly. During multiple state and national elections in India tons of plastic waste generated from campaign materials such as banners, posters, and flags made of Polyvinyl Chloride (PVC) and other non-recyclable materials. All these wastes ended up in landfills or water bodies².

Large rallies, vehicle convoys, and air travel of the candidates in the election campaigns significantly increase greenhouse gas emissions. During 2019 Lok Sabha elections in India, increasing election's carbon footprint was evident because of campaigning

¹ "Eco-friendly polling stations receive applause from voters", P. LAXMA REDDY, THE HINDU February 11, 2026 06:54 pm IST, <https://www.thehindu.com/news/national/telangana/eco-friendly-polling-stations-receive-applause-from-voters/article70619657.ece>

² "Opportunities to reduce plastic pollution in elections: Policy brief for electoral management bodies (EMBs) and political parties (PPs)", Barack Aran, September 2024, https://www.wfd.org/sites/default/files/2024-09/wfd_2024_opportunities_to_reduce_plastic_pollution_in_elections.pdf

through thousands of rallies with vehicles. One estimation revealed that about 660 million kilograms (660,000 tonnes) of CO₂ was emitted³. The use of loudspeakers, fireworks, and mass gatherings contributes to noise pollution that affects both humans and environmental health concerns. In December 2024, the Municipal Corporation of Delhi (MCD) and local municipal bodies of the cities of Mumbai have faced significant challenges with election campaign related waste management. MCD reported about daily shortfall of approximately 3,000 tonnes of municipal solid waste during this period and the Supreme Court of India and environmental authorities have expressed their extreme dissatisfaction about the Municipal Corporation of Delhi's (MCD) inability to manage the city's mounting garbage⁴.

In the recent past years, from late 1990s till date, the adoption of Electronic Voting Machines (EVMs) and digital voter awareness campaigns reduces dependence on paper to a little extent, though not so significant. This helped to conserve forests and reduces industrial pollution to some extent, even though not so remarkable and eco-friendly alternatives like cloth-banners and other biodegradable materials helped to minimize waste. Road rally etc. travel-related emissions was reduced due to virtual campaigning through social media and online platforms. Green polling booths using solar energy and waste segregation systems promote sustainability at the grassroots level.

So, where the traditional election practices impose significant environmental costs through resource depletion, pollution, and waste generation, the green election practices, by contrast, offer a viable pathway to reduce these impacts while maintaining democratic integrity by following the advocacy of the United Nations of integrating sustainability into governance processes, including elections, through frameworks such as the Sustainable Development Goals (SDGs). Integrating sustainability into electoral systems is essential for achieving long-term ecological balance and aligning democratic processes with the principles of sustainable development.

³What is the carbon footprint of conducting elections in India?, <https://m.dailyhunt.in/news/india/english/deccan+herald-epaper-deccan/what+is+the+carbon+footprint+of+conducting+elections+in+india-newsid-n591434376>

VI. CHALLENGES AND LIMITATIONS IN IMPLEMENTING GREEN ELECTIONS ACROSS DIFFERENT REGIONS.

India is gradually favouring environmentally sustainable electoral practices. Even though implementation remains questionable it is slowly gaining policy attention. The lackings and regional disparities are due to geographical diversities, socio-economic disparities, and administrative complexities.

The problem that India is facing at present is the differences in economic development across states and districts. And it is the fact that, wealthier urban regions can adopt eco-friendly practices such as solar-powered polling booths and digital campaigning. But, economically weaker states hardly become able to allocate funds for sustainable alternatives. Another major limitation is the differences between urban and rural areas. While most of the urban centers have better access to digital infrastructure and waste management systems, in contrary, the rural and remote regions rely heavily on traditional campaign methods such as non-degradable printed posters and physical rallies. E.g., in tribal and hilly regions, digital campaigning is less effective due to limited internet access, making paper-based outreach unavoidable.

In India green election measures often remained limited to pilot projects. As the green elections increasingly depend on digital tools such as online voter awareness and electronic systems the task of country-wide large-scale implementation remained incomplete. Unequal internet penetration and digital illiteracy of marginalized populations of the remote places is hindering the adoption. Moreover, the political leaders also often resist restrictions on practices such as posters, banners, roadshows, and large rallies from a fear of reduced electoral impact and see all these as essential for voter engagement because political parties.

The Election Commission of India has issued guidelines to curb plastic use and promote eco-friendly campaigns. But, enforcement remains

⁴ 3,800 tonne daily solid waste going untreated, horrible: SC, The New India Express, Apr 22, 2026 1:36 PM <https://www.newindianexpress.com/states/delhi/2024/May/14/3800-tonne-daily-solid-waste-going-untreated-horrible-sc>

inconsistent. As, India conducts the largest elections in the world, involving millions of polling personnel, remote and difficult terrains of Himalayan regions, deserts, forests etc., transporting eco-friendly materials and maintaining sustainable practices across such scale is operationally challenging. So, illegal hoardings and non-biodegradable materials are still in use. And during various state elections, municipal bodies have reported large volumes of unregulated campaign waste despite official bans. Even when green measures are introduced, waste disposal systems are often inadequate. Lack of segregation process, recycling facilities, and monitoring of the total process ultimately results in accumulation of election waste. In the smaller towns and rural areas the situation is more severe compared to metropolitan cities. Another matter is of concern that even the election officials, party workers, and the voters are not so aware of green practices. Training programs on sustainable election management are still very few in number. Additionally, India's diverse environmental conditions influence implementation to a large extent. Uniform green solutions may not be suitable nationwide. Heavy rainfall in states like Kerala can damage eco-friendly materials. Extreme heat in Rajasthan affects infrastructure choices. Ensuring inclusive elections sometimes conflicts with sustainability goals.

Printed voter slips help illiterate voters. Physical campaigning ensures outreach in low-connectivity areas. Balancing environmental concerns with democratic accessibility remains complex.

So, regional inequalities, infrastructural gaps, cultural practices, and administrative challenges are the major obstacles in implementing green elections in India. The effectiveness of the policy frameworks highly depends on localized strategies, stronger enforcement, and increased awareness. Thus, to ensure sustainability region-specific inclusive approach is essential which will not compromise electoral participation.

VII. POLICY RECOMMENDATIONS FOR INSTITUTIONALIZING SUSTAINABLE PRACTICES IN INDIA'S ELECTORAL SYSTEM.

Institutionalization of green election in India requires a structured, enforceable policy framework. Isolated region specific initiatives must be based on this policy framework. toward. Alignment of the

electoral processes in India with Sustainable Development demands coordinated reforms led by institutions such as the Election Commission of India, supported by state governments, political parties, and civil society.

In Indian context, binding environmental guidelines under election laws rather than advisory measures is best. Huge penalties must be imposed for using non-biodegradable campaign materials, illegal hoardings and waste dumping. Environmental compliance certificates for political parties and candidates must be mandated. To ensure accountability and uniform implementation across states financial incentives or tax benefits for eco-friendly campaigning can be provided. To encourage voluntary compliance while reducing financial barriers and to support comparatively financially weaker smaller parties in adopting sustainable practices, "Green Campaign Fund" generation may be an excellent idea. Expanding use of Electronic Voting Machines (EVMs), online voter awareness platforms may ensure sustainability without compromising inclusivity. To bridge the digital divide investment in rural digital infrastructure and literacy programs is mandatory. with solar energy usage eco-friendly polling booths can be mandated.

Standardized and consistent Green Protocols for Polling Stations must be made mandatory. The Election Commission of India must develop national guidelines with region-specific adaptations. Efficient green public procurement policies for election materials such as recyclable paper, biodegradable inks and fabrics must be adopted and local sourcing must be encouraged to reduce transportation emissions. r training programs for: Election officials, Political party workers must be conducted at regular interval to achieve implementation efficiency. These way only can integrate sustainability modules into election management.

In order to promote eco-friendly voting practices in India and to develop long-term cultural acceptance of green elections, collaboration with educational institutions and media is must. Different civil society organizations, environmental groups, private sector must be involved to expand capacity for innovative ideas beyond government institutions.

To track carbon footprint and waste generation of the whole election process, establishment of a Green Election Audit System is must which will also enable data-driven policy-making and accountability. To

ensure practicality and effectiveness across India's diversity pilot projects in diverse states before nationwide scaling is must. Alignment of electoral sustainability efforts with the national climate policies, UN Sustainable Development Goals promoted by the United Nations is must to position elections as part of broader environmental governance.

Institutionalization of sustainable practices in India's electoral system is the present need and it requires a combination of legal enforcement, technological innovation, financial incentives, and public participation. A holistic, region-sensitive policy approach only can transform elections from resource-intensive exercises into models of environmental responsibility. This will reinforce the synergy between democracy and sustainable development. By integrating environmental considerations into electoral governance, India can set a global example of "green democracy."

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