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'One Nation, One Election' in India: An analysis of costs, energy and sustainability

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Abstract
The idea of 'One Nation, One Election' (ONOE) in India aims to hold Lok Sabha and state assembly elections at the same time. So far, most debates have focused on political and financial issues. This paper looks at another important but less discussed aspect the environmental and resource impacts of ONOE. Most of the people argue that ONOE would reduce costs and administrative burden. However, a deeper look shows both benefits and challenges. The study brings together secondary data and case studies to assess how ONOE might affect the environment, especially in terms of resource use (paper, electronic equipment), energy needs (polling stations, transport, data systems), and waste generation. A key concern is the lifecycle of Electronic Voting Machines (EVMs) and the huge demand for materials and manpower if all elections happen at once. India's diverse climate and geography also add complexity. Compared to the current staggered model, ONOE might reduce the frequency of election-related resource use. At the same time, it could also create sudden, very high pressure on waste management, electricity supply, and infrastructure. The analysis shows that there is a serious lack of data on the real environmental costs and benefits of ONOE. While the idea of "green elections" is gaining attention, a major reform like ONOE cannot be called sustainable without more research. This includes Life Cycle Assessment (LCA) of election materials and processes, and region-specific studies on environmental risks.

Keywords: One Nation, One Election, Geography, Diversity, Sustainability etc.

1. Introduction
1.1 Introduction and Background
In India, the idea of "One Nation, One Election" (ONOE) suggests a major change to the country's electoral cycle by having the Lok Sabha (national parliament) and all State Assembly elections happen at the same time. This would mean that people all around the country would vote for both national and state representatives at the same time, or in a very short, set amount of time. This concept isn't completely new to India's political history, but it has received a lot of support in recent years. A report by the High-Level Committee on Simultaneous Elections in 2024, which has been endorsed by the Union Cabinet.

Advocates of ONOE contend that it provides significant advantages. The principal argument focusses on cost efficiency, as the existing method of staggered elections incurs substantial and repeated expenses. Consolidating elections is posited to substantially diminish expenses associated with the mobilisation of security personnel, election officials, and the establishment of polling equipment. Another important point is that the Model Code of Conduct (MCC), which is enforced in places where elections are coming up, typically for many months a year in different states, stops development activity and the implementation of policies. Also, supporters say that ONOE might increase voter turnout by making people less tired of voting in so many elections and letting governments focus more on running the country instead of always being in campaign mode.

On the other hand, critics have serious worries. A big point of disagreement is that national issues might take precedence over regional and local ones. This might hurt regional parties and weaken the country's federal system. There are also logistical and constitutional problems, such as the need for constitutional changes and the difficulty of organising one huge election.

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For example, if a state government collapses in the middle of its term, people wonder if a new government would serve a full term or just until the next synchronised election. From a resource standpoint, ONOE might cut down on the number of elections, but it would need a huge amount of resources all at once. For example, it would need about 4.7 lakh central security personnel and a lot more Electronic Voting Machines (EVMs) and Voter Verifiable Paper Audit Trails (VVPATs) to set up about 1.36 million polling places. This research transcends the political and economic discourse to rigorously assess the environmental and resource geography of the ONOE concept, evaluating its prospective effects on energy consumption, material flows, waste management, and overall sustainability within the varied Indian setting.

2. Data Source and Methodology
The study utilises secondary data sourced from official reports of the Election Commission of India, Parliamentary Standing Committees, High-Level Committee reports on 'One Nation, One Election', government expenditure records and published academic research papers. Other sources include stories or articles in the media, figures on energy use and environmental impact studies relating to the logistics of elections. The research utilises a mixed methodology, integrating qualitative document analysis with quantitative assessments of costs, energy consumption and resource savings associated with synchronised elections. A comparative analysis of previous electoral cycles and anticipated ONOE scenarios is conducted to evaluate sustainability consequences, emphasising efficiency, environmental impact and long-term resource stewardship.

3. Financial and Resource Requirements: A Contradiction of Economies and Surges
ONOE prioritises long-term cost reduction, but the move involves significant upfront capital investment and resource commitment. This creates a contradiction because operational reductions need massive procurement and deployment increases, which incurs significant environmental and logistical costs.

3.1 Procurement Surge
It would take a huge amount of work to organise simultaneous elections, including a huge increase in the number of voting machines in the country. To hold a synchronised poll, the Election Commission of India (ECI) says it needs 26.5 lakh more ballot units, 17.8 lakh more control units, and 17.8 lakh more VVPATs. This procurement campaign will cost a lot of money. A single EVM (one Control Unit and one Ballot Unit) costs about ₹17,803, and a VVPAT unit costs about ₹16,132. The ECI thinks that the ONOE exercise will cost a total of ₹7,951 crore in 2029. This number shows how big the materials and manufacturing resources needed are, each with its own carbon footprint.

3.2 Increase in Security and Personnel Costs
It would need an unparalleled amount of human resources to run synchronised polls. The ECI says that the number of central security forces will go up by 50%, which means that more than 470,000 people will need to be on duty at the same time across the country. This sudden increase in deployment has a lot of effects on resources, like

transportation fuel, temporary lodging, and electricity use. These effects are not fully accounted for in the direct election budget, but they add a lot to the overall environmental footprint.

3.3 Infrastructure Build-out
The physical infrastructure of polling must also grow to allow for simultaneous voting. The ECI says that by 2029, the number of polling places will have to go up from 1.05 million to 1.36 million. On polling day, there is a lot of demand on energy and resources around the country because each of these stations needs room, furniture, lighting, and even cooling.

4. Environmental Footprint Analysis: The trade-off between frequency and intensity
The core environmental question of ONOE is whether the impact of one massive, synchronized event is less than the cumulative impact of multiple, staggered elections. The analysis reveals a complex trade-off between reducing the frequency of environmental stress and increasing its intensity to potentially overwhelming levels.

4.1 Material Use and Waste
Elections are known for using a lot of materials. The main things that are used up are paper for administrative chores and voter lists, and plastic for campaign materials like flags, banners, and posters. The ECI has said many times that they are worried about campaigns using materials that don't break down. EVMs have made it less necessary to use paper ballots, although VVPATs still need thermal paper rolls.
A synchronised election would consolidate the production of this garbage into a brief timeframe. The 2019 Kerala "Clean and Green Election" effort, which prohibited flex and non-biodegradable materials, led to the elimination of over 1.7 million campaign items, highlighting the magnitude of the issue within a single state. If you apply this to the whole country, ONOE might make tens of millions of these things, which would make it very hard for cities to deal with all the trash.

4.2 Energy and Grid Stress
Energy is used at every stage of an election, from powering more than a million polling places to maintaining secure data and counting centres. The Puducherry GELS-2024 case study, a pilot for carbon-neutral elections, determined that the electoral machinery utilised 28,333 units of power. Scaling this up to 1.36 million polling places under ONOE means that the whole country would need about 45 GWh of energy in one day, not counting centres and logistics. This sudden, huge load would put a lot of stress on regional power networks. In places where the power is unstable, people would probably have to rely on diesel generators, which would make direct emissions go up.

4.3 Transport Emissions
During elections, transport is a major source of carbon emissions. This covers the travel of around a billion voters, as well as the transportation of officials, security forces, and EVMs. The study in Puducherry found that 41% of all the emissions from the election came from cars used to transport voters and campaign vehicles. A comparative analysis of Estonian elections revealed that voter transit constituted the predominant factor in the carbon footprint.

Under ONOE, there would be fewer trips related to elections every five years, but the highest emissions from a single, nationwide mobilisation would be higher than ever before.

4.4 Climate and Health Externalities
A single election throughout the country puts the whole process at risk from seasonal weather. Voters and poll workers are at a lot of risk for their health when there are heat waves in India that are getting worse and more common. During the 2024 elections, the weather was so hot that officials had to make changes, such providing drinking water and extending voting hours. A set ONOE timetable would make it harder to avoid these kinds of bad weather, which could hurt vulnerable groups and lead to more health and safety problems.

5. Life-Cycle Assessment Gap: The Unmeasured Impact of EVMs
A major problem with ONOE's environmental evaluation is that there isn't a full Life Cycle evaluation (LCA) for India's EVMs and VVPATs. We don't know the real environmental impact of buying, using, and throwing away millions of these devices without this information.

5.1 Manufacturing Hotspots
It takes a lot of energy to make EVMs because they have parts like Printed Circuit Boards (PCBs), polymers, and batteries. We know the direct cost, but we don't know how much energy and pollution the worldwide supply chains for these products use. This lacking information makes it impossible to figure out how much carbon investment is needed up front for the huge purchases that ONOE is making.

5.2 Operational Footprint
EVMs are expected to last for 15 years and use very little energy when they are working, thanks to their compact battery packs. But the operational footprint also includes the logistics of moving things around, storing them safely, and keeping them in good shape during this time. The energy and emissions involved in relocating and storing millions of machines for a single large-scale event as opposed to several smaller ones is a critical variable that has yet to be assessed.

5.3 End-of-Life Scenario and E-Waste
After 15 years, all of the EVMs and VVPATs in the fleet become electronic waste (e-waste). India already makes a lot of e-waste, and if ONOE set up a synchronised buying cycle, there would also be a synchronised disposal cycle. This would create a huge, concentrated rush of e-waste that might overwhelm recycling facilities. India has rules for managing e-waste that require Extended Producer Responsibility (EPR), but it's not clear how these rules apply to and are enforced for EVMs.

6. Case Studies from Estonia and Indonesia
When we look at India's ONOE plan and how other countries have changed their voting systems, we see both good and bad examples:

Country	Model	Carbon Impact	Operational Outcome	Relevance to India
Estonia	Internet Voting (E-voting)	By not having to go to vote, the carbon footprint is much lower (estimated to be 180 times lower than paper voting).	In 2023, there will be a lot of trust, security, and more than 50% voter turnout.	Shows how much digital solutions can help make "Green Elections," but India has problems with the digital divide that make it hard to scale them up.
Indonesia	Synchronized Elections (Elections that happen at the same time	A concentrated logistical footprint, yet not clearly measured in terms of carbon.	In 2019, there were serious logistical problems, such as not enough ballots, wrong deliveries, and the terrible deaths of hundreds of overworked poll workers.	A severe caution regarding the human and logistical hazards of executing synchronised elections on a large scale without adequate stress-testing and resource allocation

The above comparison shows a very important choice. Estonia's example demonstrates that technology, particularly safe internet voting, may significantly diminish the environmental impact of elections, chiefly by reducing transportation emissions. But Indonesia's experience is a strong warning that just synchronising elections without fundamentally changing the logistics might lead to systemic failure and terrible human costs. This means that for India, ONOE's success depends not only on consolidation, but also on making big investments in both digital infrastructure and strong, humane logistics systems.

7. Waste Management Challenges
The pattern of election-related garbage generation would be drastically altered by ONOE, moving from several controllable local streams to a single, nationwide inflow.

7.1 Plastic and Paper Flow
Posters, banners, and pamphlets used in traditional campaigns create a lot of waste. At the state level, initiatives like Kerala's "Clean and Green Election" have worked by banning materials that don't break down and encouraging alternatives like paper placards and fabric banners. But ONOE would bring all of this waste together in one place, which could put too much demand on already-stressed municipal waste systems.

7.2 E-waste Governance
The fact that ONOE buys EVMs all at once and that they last for 15 years means that millions of them will be taken out of service at the same time in the future. This makes the problem of e-waste huge but easy to see coming. An effective and enforceable Extended Producer Responsibility (EPR) framework is necessary, which holds manufacturers (like BEL and ECIL) accountable for collecting, recycling, and safely disposing of these devices. This e-waste could end up in landfills, where it could leak dangerous materials, if there isn't a clear plan.

8. ONOE: Mitigation & Adaptation Strategies
If ONOE is to be pursued, its implementation must be paired with a robust suite of mitigation and adaptation strategies to make it environmentally viable.

8.1 Adopting a National "Green" model code of conduct
India should establish a national "Green MCC" based on

what has worked in some states. This would mean that single-use plastics and campaign materials that can't be broken down would be banned across the country, just like the rules the Kerala High Court has in place. It should also encourage digital campaigning (email, social media and websites) to save paper and energy.

8.2 Investing in renewable energy and low-carbon logistics

It is possible to reduce the large amount of energy that polling places and logistics use. This means putting money into solar electricity for polling places and election offices, especially in outlying locations, so they don't have to rely on diesel generators as much. Also, moving election materials and people from the road to the rail when possible and encouraging voters to use public transportation can greatly lower transportation emissions.

8.3 Exploring digital alternatives and flexible scheduling

To be sustainable in the long term, we need to look into new voting technology. Estonia has shown that testing safe internet voting might greatly minimise the physical footprint of elections. In the meantime, it's very important to make the ONOE architecture more flexible. This may mean giving officials a regional scheduling window (like 21 days) to undertake polling while avoiding catastrophic weather events like heatwaves or cyclones. This would make things safer and cut down on the requirement for energy-intensive climate control.

9. ONOE: Major Recommendations

The research uncovers significant knowledge deficiencies that need to be addressed before ONOE can be deemed environmentally sustainable. A specific recommendations are:

- **National LCA Program for Election Technology:** An independent Life Cycle Assessment (LCA) of EVMs and VVPATs is a must. This must measure the embodied energy, material flows, and effects at the end of life in order to help with green procurement and EPR regulations.
- **Integrated Emissions Modelling:** Create quantitative models that compare the entire environmental impact (carbon, waste, water) of the existing staggered system with that of a synchronised ONOE system. To take into consideration different grid carbon intensity and logistical problems, this model needs to be broken down per region.
- **Climate Vulnerability Assessment:** A national research is necessary to delineate the effects of varying climatic variables (heatwaves, monsoons, cold waves) on a single voting day, pinpointing high-risk areas and guiding adaptive scheduling methodologies.
- **Pilot Study Roadmap:** Before ONOE is used nationwide, it should be put through its paces in phased pilot projects, such holding elections at the same time in two nearby states. This would provide us very useful real-world information on where logistics break down and how much waste we can handle.

10. Conclusion

The 'One Nation, One Election' initiative presents a persuasive concept of electoral efficiency and diminished governance interruption. But this study of its geography of resources and the environment shows that there is a high-stakes trade-off. ONOE trades the long-term, widespread environmental damage caused by staggered elections for a short-term, very concentrated damage that might put a lot of stress on the country's resources, electricity infrastructures, and waste management systems.

It's evident that there is a chance for long-term savings, but it will cost a lot of money and require a huge amount of planning. Indonesia and Estonia are two international examples that provide a clear choice: either too much logistics and failure, or a sustainable leap ahead through technology. There are examples of successful mitigation efforts, such as Kerala's "Green Election" and Puducherry's carbon-neutral pilot. However, it will be very hard to make these efforts work on a national basis under ONOE.

In the end, ONOE's environmental sustainability isn't assured and depends on proactive design, not adjustments after the fact. Before making the switch to such a system, there needs to be thorough, data-driven research to fill in the important gaps in our knowledge, especially about the life-cycle impact of voting technology and the real carbon cost of logistics. Without this basic work, India could end up with a far worse, more concentrated, and possibly permanent environmental problem instead of a political one.

References

1. Bhaswat P. One Nation One Election: a comparative analysis from voter behavior to political polarization [Internet]; 2024 [cited 2025 Sep 24]. Available from: https://papers.ssrn.com
2. Election Commission of India. Handbook for counting agents. New Delhi: Election Commission of India; 2007.
3. Election Commission of India. Handbook for returning officer (for elections to the House of the People and the Legislative Assemblies). New Delhi: Election Commission of India; 2009.
4. Election Commission of India. General Elections 2024-(2)-No of electors, polling stations, etc. [Internet]. [Cited 2025 Sep 24]. Available from: https://www.eci.gov.in
5. High-Level Committee on One Nation, One Election. One Nation, One Election report [Internet]. Government of India; 2024 [cited 2025 Sep 24]. Available from: https://www.pib.gov.in
6. Willemson J, Krips M. Estimating carbon footprint of paper and internet voting. In: Krimmer R, *et al.*, Editors. E-Vote-ID 2023: Eighth international conference on electronic voting. Cham: Springer; 2023, p. 143-158. (Lecture Notes in Computer Science; vol 14130). https://doi.org/10.1007/978-3-031-43756-4_9
7. Observer Research Foundation. "One Nation-One Election" is vital for good governance [Internet]; 2023 [cited 2025 Sep 24]. Available from: https://www.orfonline.org/expert-speak/-one-nation-one-election-is-vital-for-good-governance
8. The Hindu. Stop the dithering and encourage green elections in India [Internet]; 2024 Feb 17 [cited 2025 Sep 24]. Available from: https://www.thehindu.com/opinion/op-ed/stop-the-dithering-and-encourage-green-elections-in-india/article67892855.ece
9. Times of India. ONOE logistics and costs [Internet]; 2024 Aug 31 [cited 2025 Sep 24]. Available from:

https://timesofindia.indiatimes.com/india/nearly-rs-8000cr-needed-for-onoe-in-2029-ec-to-kovind-panel/articleshow/113612128.cms

10. Prevention Web. Natural hazards and elections in India: lessons in adaptation and mitigation [Internet]. 2021 [cited 2025 Sep 24]. Available from: https://www.preventionweb.net/resource/case-study/natural-hazards-and-elections-india-lessons-adaptation-and-mitigation

11. BBC News. Lok Sabha: Indians vote in scorching heat [Internet]; 2024 May 24 [cited 2025 Sep 24]. Available from: https://www.bbc.com/news/world-asia-india-68963549

12. Election Commission of India. Kerala's green election 2019 [Internet]; 2019 [cited 2025 Sep 24]. Available from: https://www.eci.gov.in

13. Grant Thornton. Towards greener elections in India [Internet]; 2023 [cited 2025 Sep 24]. Available from: https://www.grantthornton.in/insights/media-articles/towards-greener-elections-in-india/

14. Election Commission of India. FAQs on EVM [Internet], [Cited 2025 Sep 24]. Available from: https://www.eci.gov.in/evm-faqs

15. Economic Times. Conducting simultaneous polls across the country in 2029 will cost Rs 8000 crore [Internet]; 2024 Sep 1 [cited 2025 Sep 24]. Available from: https://m.economictimes.com

16. Election Commission of India. Counting centers arrangement including security arrangements [Internet]. 2024 [cited 2025 Sep 24]. Available from: https://hindi.eci.gov.in

17. Yagay & Sun. Why it is good for environment, nature and climate, if [Internet]; 2023 [cited 2025 Sep 24]. Available from: https://www.taxtmi.com/article/detailed?id=14011

18. Chief Electoral Office, Delhi. Unique stories / best practices / information [Internet]; 2023 [cited 2025 Sep 24]. Available from: https://www.ceodelhi.gov.in

19. Election Buddy. Electronic voting and sustainability: A greener approach to democratic processes [Internet]; 2023 Aug 31 [cited 2025 Sep 24]. Available from: https://electionbuddy.com

20. Time. How extreme heat will impact India's election [Internet]; 2024 Apr 18 [cited 2025 Sep 24]. Available from: https://time.com/6965370/india-heat-temperature-election/

21. United States Environmental Protection Agency. E-waste management in India [Internet]. Washington, DC: USEPA; 2014 [cited 2025 Sep 24]. Available from: https://www.epa.gov/sites/default/files/2014-05/documents/india.pdf

22. Kuorum.org. Online voting as a sustainable alternative [Internet]; 2023 [cited 2025 Sep 24]. Available from: https://www.kuorum.org