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## Charting the Course: Navigating the Intersection of Environmental Rule of Law and the Technological Revolution - Insights from the National Green Tribunal

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### Abstract

The concept of the ERoL is a vital part of any country's efforts to achieve sustainable development. It requires that environmental decisions are made according to the law and involve participation and transparency. Unfortunately, the ERoL is facing various challenges as technological changes affect its implementation. The rapid technological evolution has led to the emergence of new environmental threats. The ERoL is therefore required to accommodate these changes and prevent them from happening. This study aims to analyze the various aspects of the ERoL's implementation concerning India's National Green Tribunal. Established in 2010, the NGT is a specialized court that's dedicated to hearing environmental disputes. This study explores the functions of the NGT and how it can accommodate and manage the technological changes that have affected the ERoL's implementation. According to the study, the NGT's rulings have helped preserve the ERoL in India by making significant advancements in protecting the environment. The court has also taken the necessary steps to improve its efficiency by utilizing technology. The report also highlighted some of the challenges that the NGT encounters due to the technological changes. These include having access to specialized knowledge, ensuring that its decisions are based on reliable data, and keeping up with the rapid pace of technological change. The study noted that the NGT is an important institution in India that upholds the ERoL. Despite the technological advancements that have occurred over the years, it still encounters challenges in its efforts to protect the environment. It is therefore important that the court takes the necessary steps to address these issues.

**Keywords:** Environmental Rule of Law, Technological Revolution, National Green Tribunal, Legal Frameworks, Environmental Monitoring, Data-driven Decision Making, Ethical Considerations, Public Participation, Capacity Building,

### Introduction

The intersection between the environmental rule of law and the technological revolution has become a crucial focus of attention and investigation in modern environmental governance. The convergence of the environmental rule of law and the continuous technological revolution is a crucial element of modern environmental governance. The National Green Tribunal (NGT) is crucial in resolving environmental conflicts and upholding environmental legislation, in India. Analyzing this confluence using the NGT perspective offers valuable insights into how legal frameworks are adjusting to the problems and opportunities brought about by swift technological improvements. The eradication of poverty among the general population is not only a fundamental constitutional duty for every elected government but also a crucial criterion for its survival. Preserving the environment and upholding the ecological equilibrium has become an equally urgent responsibility for every government. Every nation in the world has struggled to find a balance between these two aims. The task of



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finding a balance between two opposing needs becomes increasingly complex for developing nations. The resolution to this conflict can be found in the notion of 'Sustainable development'.<sup>1</sup>

The genesis of green politics may be traced back to the Industrial Revolution that occurred throughout the late 18th and early 19th century. Some contend that it did not qualify as a revolution per se, as the development of mills, industries, cities, and associated elements may be traced back to earlier transformations. However, it is undeniable that the events that occurred resulted in significant societal transformations. Industrial investment and expansion in Britain, Western Europe, and North America were rapidly increasing due to technical innovation. Throughout the 19th and 20th centuries, populations saw significant growth and cities rapidly expanded. All of this contributed to the mechanisms of economic expansion. Despite occasional recessions, sustained economic development and industrial expansion occurred throughout the twentieth century due to ongoing technical advancements. According to Kondratiev, an economist from Russia, there have been several waves of economic growth. The initial phases of the expansion were triggered by the development of new technologies. However, as the wave of expansion that was triggered by the growth of electrical consumer goods and petrochemicals started to decline during the 1970s and 80s, the information revolution took over. The various changes that have occurred during the past few decades have led to new investment opportunities. One of the most important factors that has been identified as a contributing factor to the growth of the next wave is the location of the industry. During the initial stages of expansion, textile mills were built using rivers. As the availability of steam power increased, industrialists started moving to cities. During the late 20th century, as technology improved and the need for cheap labor became paramount, many textile firms started investing in underdeveloped regions.<sup>2</sup>

Since the adoption of the Stockholm Declaration in 1972, there has been a substantial global growth in the quantity of environmental regulations and laws. Every country now possesses at least one regulation or law pertaining to the environment. Furthermore, numerous nations have formed or enhanced their own environmental ministries. These institutions and legislation have effectively mitigated or decelerated environmental degradation. The advancements gained in tackling environmental challenges are accompanied by an increasing recognition of a discrepancy between the legal standards and their actual implementation. This gap can be resolved by implementing environmental legislation and regulations. Environmental governance pertains to the acknowledgment and implementation of legislation aimed at safeguarding the natural world.<sup>3</sup> Despite the various environmental laws that have been enacted around the world, their effectiveness in addressing the issues of pollution, biodiversity loss, and climate change remains a challenge. The rapid disappearance of biodiversity due to landscape transformation is increasing, and governments have failed to protect these areas. Air and water pollution are major issues, and new threats such as plastic

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<sup>1</sup>T N Subramanian & Rubin Vakil, *The Mechanisms of the National Green Tribunal*, 30 74 (2018).

<sup>2</sup>1 STEPHEN C. YOUNG, *THE DIFFERENT DIMENSIONS OF GREEN POLITICS* (1992).

<sup>3</sup>UN ENVIRONMENT, *ENVIRONMENTAL RULE OF LAW - FIRST GLOBAL REPORT* (2019),

[https://wedocs.unep.org/bitstream/handle/20.500.11822/27279/Environmental\\_rule\\_of\\_law.pdf](https://wedocs.unep.org/bitstream/handle/20.500.11822/27279/Environmental_rule_of_law.pdf).



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pollution are threatening the waterways. Around 99 percent of the world's population lives in areas that do not meet WHO air quality standards.<sup>4</sup>

In the last three decades, the judiciary of India has made significant contributions to the improvement of the country's environmental governance and law. It has delivered numerous landmark rulings on a wide range of issues, such as illegal mining, pollution, vehicular fumes, and deforestation. Through its interventions, the judiciary has been able to push executive agencies to take action on important issues related to the environment. Although it is sometimes criticized for its overreach, the court has also established a constitutional mandate to protect the environment. In addition, the judiciary has established a legal structure that is central to India's environmental laws and is frequently used in cases involving the environment. Various factors have contributed to the country's remarkable judicial activity in this domain. In addition, the country's laws and regulatory structures have inadequate coverage and liability provisions, which can prevent them from effectively addressing environmental degradation. Even though Parliament has been addressing these issues since the 1970s, its environmental laws are still not up to date. The implementation and design of various regulatory procedures, such as the granting of environmental permits, are often not aligned with the intended outcomes. Moreover, statutory bodies, such as pollution control boards, are not adequately resourced and are susceptible to external influences. When the executive and legislative branches are underperforming, the people affected by environmental issues or who are dissatisfied by policies or decisions related to the environment often turn to the judiciary for help. Also, due to the lack of comprehensive rights related to natural resources, there are at least three issues that need to be resolved. No single person or group is dedicated to protecting the environment. This is a classic example of the common case, where the interests of groups and individuals are often conflicting with those of the environment. For instance, while the members of the tribal communities rely on forests for their livelihood, mining companies are often involved in the activities of the mining industry. Finally, the spatial and temporal variations of the resources can make it difficult to predict and manage their effects. For instance, deforestation and the effects of dams on the groundwater supply can affect different regions.<sup>5</sup>

The lack of political will and the long-term planning needed to address environmental issues are also factors that prevent the country from effectively managing its resources. Human and financial resources are required for the protection of the environment, but with limited political support, environmental groups tend to lose their claims. The inability of the government to effectively address environmental issues is further exacerbated by the jurisdictional conflicts between the states, the central government, and various departments. As a result, India's judiciary, including the Supreme Court, the High Courts, and the NGT, has been called upon to play a leading role in addressing these issues. Despite the criticism that they are stepping on the toes of the executive and legislative branches, the judiciary in India has been able to address various environmental issues. They have issued numerous orders to protect the environment, such as protecting wildlife and habitats, implementing measures to prevent vehicular and industrial pollution, and rehabilitating the project-affected

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<sup>4</sup>ENVIRONMENTAL RULE OF LAW: TRACKING PROGRESS AND CHARTING FUTURE DIRECTIONS, ENVIRONMENTAL RULE OF LAW: TRACKING PROGRESS AND CHARTING FUTURE DIRECTIONS (2023).

<sup>5</sup>SHIBANI GHOSH, INDIAN ENVIRONMENTAL LAW : KEY CONCEPTS AND PRINCIPLES.



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people. Through its influence, the judiciary has been able to influence the policies and procedures related to the environment. It also regularly monitors their implementation.<sup>6</sup>

### **The Technological Revolution: A Transformational Change in Environmental Challenges**

The rapid emergence and evolution of technological innovations have greatly changed the way environmental problems are perceived and addressed. Due to technological advancements, a wide range of new challenges has emerged that require the creation of novel approaches and ideas to effectively manage the environment.

### **The NGT (National Green Tribunal) and the ERoL (Environmental Rule of Law)**

The NGT was established in 2010 to resolve environmental disputes. It has the power to oversee various environmental issues, such as solid waste administration and air and water contamination. The NGT's primary objective is to ensure that justice is done quickly and efficiently in cases involving the environment. It has taken advantage of technology to enhance its performance and operational effectiveness. Moreover, it has a website that allows members of the public to submit their complaints. The tribunal uses video conferencing to hold hearings and establish connections with stakeholders and experts. In India, the NGT plays a vital role in the enforcement of the environmental rules of law. It has issued numerous rulings that have improved the protection of the environment. For instance, the tribunal has ordered industries to stop releasing pollutants and has imposed heavy penalties on firms that violate the rules. The NGT has also been using technology to monitor and enforce the environment. Its decision-making process aligns with the concepts of the ERoL. The tribunal's rulings are based on legal principles, and it allows members of the public to participate in its deliberations. The decisions of the NGT are transparent and accountable. It also guarantees that people have access to the legal remedies available for environmental damages.

**Navigating the Confluence: The ERoL in the Era of Technological Revolution-The ERoL must adapt to address the environmental threats brought about by technological change. This adaptation involves a comprehensive approach.**

- **Enhancing Environmental Legislation:** The ERoL must update its environmental legislation regularly to address the technological changes that are affecting the environment.
- **Promoting Technological Innovation for Environmental Sustainability:** Technological innovations can help the ERoL address environmental issues and promote sustainable practices.
- **Promoting Public Participation and Awareness:** It is also important that the public participates in the decision-making process regarding the environment. This can help hold organizations and individuals accountable.
- **Facilitating Global Collaboration:** The facilitation of global collaboration would help solve environmental problems and develop effective strategies.

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<sup>6</sup>*Id.*



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## **The National Green Tribunal: A Case Study in Upholding the ERoL**

The NGT is an institution that is dedicated to protecting the environment's legal principles during the technological era. It was established in 2010 to address environmental issues. Through its various initiatives, the NGT has been able to maintain India's environmental rule of law. Numerous rulings by the NGT have helped improve the country's environmental protection. The NGT has made use of technology to enhance its effectiveness and efficiency when it comes to upholding the Erol. Through an online registration system, the NGT has made it easier for members and organizations to file complaints regarding environmental issues. The NGT has also utilized video conferencing to hold hearings, which has minimized the need for people to travel and made the process more accessible. Through remote monitoring systems and data analytics, the NGT was able to collect real-time information about the environment. Through its partnership with technology companies, the NGT has been able to create innovative ways to enforce and monitor environmental laws. Even though the NGT has made commendable achievements, it encounters numerous challenges in the current technological age, as opposed to previous generations. The NGT has to constantly look for new ways to tackle challenging environmental issues, and it requires the expertise of various technical and scientific fields to do so. The NGT must ensure that its decisions are based on sound scientific evidence. This can only be achieved through the necessary expertise and analytical capabilities. The NGT must also keep up with the latest technological advancements to effectively address environmental issues and utilize new techniques.

## **Recommendations for Advancing the ERoL in the Technological Era**

The rapid pace of technological change is creating new opportunities for law enforcement and environmental monitoring. It also raises questions about the fairness of the justice system and the privacy of the people. The collaboration between the tech sector and environmental agencies and policymakers is often ad hoc, and it focuses on specific initiatives and projects. The collaboration between the tech sector and environmental agencies can help improve the efficiency and effectiveness of the environmental rule of law. It can also help identify the priorities of the various stakeholder groups. This type of collaboration could follow the successful model of science-policy interfaces that have been established to address global environmental issues, such as climate change. A technology-policy interface for the regulation of the environment could act as a platform for information sharing and collaboration between stakeholders and developers. Through an interface between the tech sector and environmental agencies, organizations and policymakers can gain a deeper understanding of the technological advancements that have already occurred in the field.<sup>7</sup>

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<sup>7</sup>ENVIRON. RULE LAW TRACK. PROG. CHARTING FUTUR. DIR., *supra* note 4.





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Various suggestions have been presented to address the NGT's issues and improve EROL's efficiency during the era of technological change. The creation of a national council of environmental experts is needed to ensure that the NGT has access to the most relevant expertise. It is also important to establish an extensive knowledge base that will allow the NGT to access the most up-to-date technical and scientific information. To ensure that the NGT is equipped to handle the latest technology, the agency should allocate substantial funds toward training and infrastructure. Encouraging international collaboration would help develop innovative and game-changing technologies that can help protect the environment.

The rapid emergence and evolution of new technology has profound implications for the environment. Its impact can be both beneficial and harmful. Some of the environmental monitoring and enforcement tools that can be improved by this technology include remote sensing and data analytics. The NGT should regularly update its legal frameworks to accommodate the latest innovations in environmental monitoring and enforcement. Doing so would ensure that these new technologies are compatible with existing legislation. The use of technology can significantly enhance the implementation and surveillance of environmental enforcement. Through the use of drones, satellites, and sensor networks, the NGT can now collect data on the status of the environment in real time. This can help the agency identify and address violations more effectively. By utilizing technology, the NGT may utilize data to monitor entities or individuals that are causing pollution, create comprehensive databases, and simplify the procedure for settling legal proceedings. This approach can significantly enhance the efficacy of resolving disagreements and fortifying environmental regulations. The NGT can now make better decisions by analyzing and utilizing data collected from the environment. This can help it identify areas of concern and prioritize cases related to their significance. Through the use of data analytics, the agency can also improve its efficiency and address environmental issues.

The NGT has to deal with various ethical and privacy issues regarding cyber security, the use of new technology, and the protection of personal information. It is important to consider how enhanced surveillance may affect individual liberties. The agency must also develop procedures and rules that will help ensure the proper utilization of such technology. The technological advancements that have occurred over the past few years have provided the NGT with new opportunities to engage with the public and make informed decisions regarding the environment. By utilizing social media, digital platforms, and other such innovations, the NGT can reach out to the public and encourage them to become involved in the conservation process. The NGT should use technological advancements to improve transparency and make public information more accessible. Doing so would reinforce the democratic principles that guide environmental law. Various organizations and agencies, such as the NGT, should allocate resources toward enhancing the knowledge of their stakeholders. Doing so will allow them to effectively utilize new technology. In addition, providing guidance to judges, environmental specialists, and attorneys on how to utilize technology effectively can help improve the justice system's efficiency in addressing environmental issues.



## **Conclusion**

The connection between technological advancements and the legal framework that governs the environment has several challenges and prospects. The National Green Tribunal should play a leading role in addressing these issues to ensure that the environment is protected. The NGT can help strengthen the legal framework and address environmental issues by adopting technological innovations. The emergence of new technologies has raised the possibility of obstacles in the way of environmental regulations being enforced. The ERoL must therefore develop and implement procedures designed to protect the environment adequately. As a pioneering organization dedicated to preserving the ERoL, the NGT can serve as an example for other nations by effectively managing technological advancement and environmental preservation. By identifying the issues and implementing the suggested solutions, it can play a vital role in safeguarding the environment for the future.