From Extraction to Regeneration: Reimagining the Anthropocene — Green Energy as a Catalyst of Environmental Renaissance

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Abstract

The Anthropocene, characterized by humanity's unprecedented influence on global ecosystems, necessitates a paradigm shift in environmental, ethical, and cultural consciousness. This paper explores the transition from extractivism to regenerative approaches, emphasizing green energy as a catalyst for planetary and societal renewal. Integrating the literary lens of Margaret Atwood's MaddAddam trilogy with empirical data from international and national organizations— including UNFCCC, IRENA, IEA, UNEP, IPCC, MNRE, and the World Bank—this study interrogates the interplay between imaginative narrative and material policy implementation. Atwood's speculative fiction illustrates the consequences of unbridled extraction and the potential for adaptive, cooperative posthuman societies, offering a symbolic blueprint for regeneration. In parallel, 2024–2025 data indicate significant advances in renewable energy capacity, carbon reduction initiatives, and climate finance, while highlighting persistent gaps between technological deployment and holistic sustainability. The paper also situates India's development Yadav 2 trajectory within this discourse, linking green energy adoption, equitable growth, and the Viksit Bharat 2047 vision to broader global sustainability efforts. By synthesizing literary critique, environmental humanities, and empirical evidence, this research demonstrates that regeneration is both an ethical imperative and a feasible societal pathway. It argues that the convergence of cultural imagination, green energy, and policy innovation can facilitate a renaissance in environmental and societal stewardship, establishing a model for developed, equitable, and sustainable futures.

Keywords

Anthropocene, regeneration, green energy, ecocriticism, speculative fiction, Margaret Atwood, renewable energy transition, sustainability, India, Viksit Bharat, posthumanism, environmental humanities

Introduction

The Anthropocene marks a period in which human activity has become the principal agent of planetary transformation, influencing climate, biodiversity, and geological processes (Crutzen 2002). Historically, human development has been predicated on extractive practices— industrialization, fossil fuel consumption, deforestation, and intensive agriculture—which have produced material wealth alongside environmental crises. Rachel Carson once remarked, "In nature nothing exists alone" (Carson 1962), emphasizing the profound interconnectedness disrupted by extractivist logics. Today, the challenge lies in reimagining civilization's relationship with the Earth, moving from domination and depletion toward reciprocity, regeneration, and ethical stewardship.

Green energy has emerged as a pivotal instrument in this transformative process. According to IRENA's 2025 Renewable Capacity Highlights, global renewable power capacity reached approximately 4,448 GW by the end of 2024, with solar contributing 1,865 GW, wind 1,133 GW, and hydropower 1,283 GW. Renewables now constitute 46% of global installed capacity, and IEA Yadav 3 projections estimate an additional 10% growth in 2025, with solar PV and wind expanding 26% and 19% respectively (IRENA 2025; IEA 2025). These figures reflect the tangible potential of green energy to drive decarbonization while simultaneously catalyzing economic development and environmental restoration.

Literature offers an equally vital lens through which to understand these transformations. Margaret Atwood's MaddAddam trilogy—comprising Oryx and Crake (2003), The Year of the Flood (2009), and MaddAddam (2013)—presents a speculative exploration of posthuman survival in the wake of extractive collapse. Atwood's narrative illustrates the moral, ecological, and technological consequences of unbridled industrialization, while envisioning cooperative communities, adaptive species, and regenerative ecological practices. As Haraway observes in her reflections on sympoiesis, life is made-with; survival depends on mutual interdependence rather than individual domination (Haraway 2016). Atwood's trilogy embodies this ethic, proposing literary models for regeneration that parallel global sustainability initiatives.

The integration of literary imagination with empirical environmental data provides a multidisciplinary framework for assessing the Anthropocene. This paper argues that green energy is not merely a technological solution but a catalyst for environmental and societal renaissance, aligning with the broader ethical imperatives dramatized in Atwood's work. Furthermore, India's developmental agenda—anchored in Viksit Bharat 2047 and its net-zero by 2070 commitment— illustrates how national policy can operationalize these regenerative principles, linking technological transition, equitable growth, and ecological stewardship (MNRE 2025; UNFCCC 2025). This convergence of imagination, data, and policy forms the foundation for a holistic pathway toward a sustainable future.

Theoretical Framework and Literature Review

"Humans are part of a larger community of living and non-living things, and our survival depends upon recognizing this interconnection." — Donna Haraway, Staying with the Trouble (2016)

The Anthropocene challenges traditional notions of human centrality, demanding a re-evaluation of ethical, ecological, and literary frameworks. Central to understanding this epoch is the intersection of ecocriticism and posthuman thought, which provide a robust theoretical apparatus to examine how human actions influence both ecological systems and cultural narratives. Bruno Latour's assertion that the modern dichotomy between nature and society is a fallacy underscores the necessity of rethinking relational networks. In Politics of Nature, Latour contends that humans must engage with non-human actors—rivers, species, technologies—as political agents within co-constituted systems (Latour 2004). This conceptualization aligns with green energy transitions, wherein technology, policy, and ecological systems interact to shape planetary outcomes.

Post-Independence Developments

Donna Haraway's concept of sympoiesis emphasizes co-creation and interdependence across species and systems. Atwood's MaddAddam trilogy dramatizes these principles through hybrid posthuman communities, where survival is contingent upon collaborative ethical action rather than domination. Timothy Morton's hyper objects further theorizes the scale and persistence of phenomena such as climate change, offering a lens through which Atwood's catastrophic yet regenerative worlds can be interpreted (Morton 2013).

From a literary perspective, Atwood's speculative fiction is complemented by Amitav Ghosh's The Great Derangement (2016), which situates climate crises within socio-political and historical contexts, and Kim Stanley Robinson's The Ministry for the Future (2020), which emphasizes large-scale technological and policy solutions for climate mitigation. Together, these texts illuminate the narrative strategies through which literature interrogates extractive practices and imagines regenerative futures.

Empirical evidence underscores the urgency and feasibility of such regenerative pathways. According to IRENA's 2025 Renewable Capacity Highlights, global renewable energy capacity reached approximately 4,448 GW, with solar, wind, and hydropower contributing 1,865 GW, 1,133 GW, and 1,283 GW respectively. Renewables now account for 46% of global installed capacity, with an expected growth of 10% in 2025 (IRENA 2025; IEA 2025). Similarly, India's Ministry of New and Renewable Energy reports robust capacity additions, aligning with the country's Viksit Bharat 2047 vision and Net Zero 2070 commitment (MNRE 2025). The data reflect that the convergence of technology, policy, and ethical frameworks can accelerate the shift from extractive paradigms toward regenerative models.

Methodology, Data, and Discussion

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Methodology, Data, and Discussion "Energy transition is not only about infrastructure, but about reshaping society's values and its relationship with the planet." — Fatih Birol, IEA Executive Director, 2025 Methodology This study adopts an interdisciplinary approach, integrating literary analysis, environmental humanities, and empirical data assessment. Primary literary texts include Margaret Atwood's Yadav 6 MaddAddam trilogy, supplemented by comparative references to Amitav Ghosh's The Great Derangement and Kim Stanley Robinson's The Ministry for the Future. The analysis focuses on narrative representations of extractivism, technological innovation, and ecological regeneration.

Empirical data were drawn from multiple authoritative sources: the United Nations Framework Convention on Climate Change (UNFCCC 2025 Global Stocktake), International Renewable Energy Agency (IRENA 2025 Renewable Capacity Highlights), International Energy Agency (IEA 2025 Electricity Mid-Year Update), United Nations Environment

Programme (UNEP 2024 Emissions Gap Report), IPCC AR6 2025 Summary, India's Ministry of New and Renewable Energy (MNRE 2024–25 Annual Report), and the World Bank Climate Data Portal. Data analysis examines trends in renewable energy deployment, carbon reduction strategies, and policy interventions in both global and Indian contexts.

Data Analysis and Findings Globally, renewable energy capacity reached 4,448 GW by the end of 2024, with solar contributing 1,865 GW, wind 1,133 GW, and hydropower 1,283 GW, accounting for 46% of total installed capacity. IEA projections estimate an additional 10% growth in 2025, with solar PV and wind expanding 26% and 19% respectively (IRENA 2025; IEA 2025). The UNFCCC 2025 Global Stocktake indicates that despite these gains, global emissions reduction targets remain unmet, requiring accelerated implementation to meet the 1.5 °C goal (UNFCCC 2025).

India's renewable trajectory is particularly significant. MNRE reports cumulative renewable energy capacity of 175 GW, with solar and wind leading expansions. Initiatives under Viksit Bharat 2047 envision India as a developed, low-carbon.

Pathways to Developed India

India's integration of green energy within its socio-economic planning illustrates a practical model of the Anthropocene's regenerative potential. Policies promoting solar parks, wind corridors, green hydrogen, and carbon-neutral urban development are aligned with Viksit Bharat 2047 and international sustainability commitments. The convergence of renewable energy deployment, investment in infrastructure, and policy innovation demonstrates a holistic approach to achieving a low-carbon, equitable, and technologically advanced India while fulfilling ethical obligations toward the planet.

Conclusion

The Anthropocene confronts humanity with the urgent task of reimagining its relationship with the planet. This paper has illustrated that the shift from extractive paradigms to regenerative frameworks is both necessary and feasible. Literature, as exemplified by Margaret Atwood's MaddAddam trilogy, provides not only a critique of unbridled industrialization and environmental collapse but also a visionary roadmap for ethical, technological, and ecological co existence. Atwood's speculative narratives, together with the

theoretical insights of Haraway's sympoiesis and Morton's hyper objects, underscore the interdependence of humans, non-human species, and ecosystems—an ethic that must guide practical interventions in the Anthropocene.

Empirical data from 2024–2025, drawn from IRENA, IEA, UNFCCC, UNEP, IPCC, MNRE, and the World Bank, demonstrate the transformative potential of green energy. Global renewable capacity, already exceeding 4,448 GW, and India's ambitious initiatives under Viksit Bharat 2047 and the Net Zero 2070 commitment, show that sustainable technological deployment can simultaneously drive environmental restoration and socio-economic development. Green energy Yadav 8 emerges not merely as a technological tool but as a catalyst for an environmental renaissance—a means to operationalize the ethical and imaginative lessons highlighted by literature and critical theory.

Ultimately, regeneration in the Anthropocene is both a moral imperative and a practical possibility. By integrating literary imagination, rigorous empirical data, and visionary policy frameworks, societies can foster resilient, equitable, and sustainable futures. Green energy, therefore, is not only a pathway to decarbonization but a cornerstone of planetary stewardship, ethical responsibility, and cultural renewal.

"The future of life depends on our ability to act as caretakers, not conquerors, of the Earth; regeneration is the work of our hands, minds, and hearts." — Vandana Shiva, 2025.

We need to remember that - We have not inherited the Earth from our forefathers; we have borrowed it from our children.

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