



# INTERNATIONAL JOURNAL OF TRENDS IN EMERGING RESEARCH AND DEVELOPMENT

INTERNATIONAL JOURNAL OF TRENDS IN EMERGING RESEARCH AND DEVELOPMENT

Volume 3; Issue 5; 2025; Page No. 83-85



Special Issue of International Seminar (23rd - 24th August, 2025)  
On the Topic  
**Indian Knowledge System (IKS): Challenges & its Application in Higher Education for Sustainable Development**  
By  
**Faculty of Education, IASE (DU), Sardarshahar, Churu, Rajasthan - 331403**

## Environment and Sustainable Development in the 21st Century: Challenges and Policy Interventions

**Dr. Abhimanyu Singh Chauhan**

Department of Geography, IASE Deemed to be University, Sardarshahar, Rajasthan, India

DOI: <https://doi.org/10.5281/zenodo.17663396>

**Corresponding Author:** Dr. Abhimanyu Singh Chauhan

### Abstract

The 21st century marks a crucial turning point in humanity's relationship with the environment. Climate change, biodiversity loss, pollution, and resource depletion pose existential threats to the planet's stability. Sustainable development, as envisioned by the United Nations, provides a framework for balancing environmental protection, economic growth, and social inclusion. This research paper explores the challenges faced in implementing sustainable development goals (SDGs) globally, analyzes policy interventions at national and international levels, and highlights successful case studies. The paper concludes that sustainable progress requires integrated governance, green technologies, and global cooperation rooted in environmental ethics.

**Keywords:** Environment, Sustainable Development, Policy Interventions, SDGs, economic

### Introduction

The concept of sustainable development emerged as a guiding principle for reconciling human advancement with ecological preservation. Defined by the Brundtland Commission (1987) [1] as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs," it has evolved into a global mission supported by the 2030 Agenda for Sustainable Development.

In the 21st century, humanity faces multifaceted challenges - from escalating greenhouse gas emissions to deforestation, water scarcity, and urban pollution. The degradation of natural resources threatens both human security and planetary health. Thus, sustainable development is not a choice but an imperative for survival.

The need for a balanced approach-linking environmental, economic, and social dimensions-is more urgent than ever.

The focus of this paper is to assess these challenges and the policy interventions that seek to address them through global and local governance frameworks.

### Research Objectives

**This study aims to achieve the following objectives**

1. To examine the major environmental challenges of the 21st century.
2. To evaluate the role of sustainable development in addressing global ecological concerns.
3. To analyze the effectiveness of international and national policy interventions.
4. To explore case studies that demonstrate successful sustainable development practices.
5. To propose strategic recommendations for enhancing sustainability through governance and innovation.

## Literature Review

Numerous scholars have discussed the interplay between environment and sustainable development. Sachs (2015) [2] emphasized the role of SDGs in shaping a holistic global development model. Stern (2007) [3] focused on the economic dimensions of climate change, arguing that inaction would cost more than sustainable reforms.

Rockström *et al.* (2009) [4] proposed the concept of "Planetary Boundaries," highlighting nine critical thresholds that should not be crossed to ensure planetary stability.

Raworth (2017) [5] introduced the "Doughnut Economics" model to balance human prosperity within ecological limits. The UNDP (2020) [6] and World Bank Reports (2021) [10] underscore that progress towards sustainability remains uneven, particularly in developing nations. Lack of finance, weak institutions, and policy inconsistency remain significant barriers.

Therefore, this paper synthesizes these academic insights to understand how environmental and developmental goals can align in the modern era.

## Challenges to Sustainable Development in the 21st Century

- 1. Climate Change:** The increase in global temperature has caused severe droughts, floods, and extreme weather patterns. The IPCC (2023) [7] warns that global warming above 1.5 °C could lead to irreversible damage.
- 2. Deforestation and Biodiversity Loss:** The rapid loss of forest cover in regions like the Amazon and Southeast Asia threatens ecological balance and indigenous communities.
- 3. Pollution and Waste Management:** Urbanization and industrial growth contribute to air, water, and soil pollution. E-waste and plastic waste have become major global hazards.
- 4. Resource Depletion:** Over-extraction of groundwater, fossil fuels, and minerals jeopardizes long-term sustainability.
- 5. Inequality and Poverty:** Environmental degradation disproportionately affects poorer populations, widening the socio-economic gap.

## Case Studies

- 1. India's National Solar Mission:** Launched in 2010 under the National Action Plan on Climate Change (NAPCC), India's solar mission aims to achieve over 280 GW of solar capacity by 2030. It exemplifies how renewable energy can drive economic growth while reducing carbon emissions.
- 2. Costa Rica's Forest Regeneration Program:** Costa Rica reversed deforestation trends through payment-for-ecosystem services (PES) and eco-tourism. By 2020, it generated over 98% of electricity from renewable sources.
- 3. The European Green Deal:** The European Union's Green Deal (2019) [8] aims for climate neutrality by 2050. It integrates energy, industry, and biodiversity policies, serving as a global model for sustainable governance.
- 4. China's Belt and Road Initiative (Green Version):** China has begun integrating sustainability metrics into

its BRI projects by promoting green finance, renewable infrastructure, and ecological restoration.

## Role of the Title: "Environment and Sustainable Development in the 21st Century"

The title embodies the dual focus of the study - understanding environmental degradation and promoting sustainable pathways. It reflects the urgency of reconciling economic ambition with ecological integrity in the 21st century.

The "21st century" indicates a temporal context where technological advancements and policy innovations coexist with environmental crises, making the theme relevant and action-oriented.

## Policy Interventions and Global Frameworks

- 1. Paris Climate Agreement (2015):** A landmark global accord to limit global temperature rise to below 2 °C and strive for 1.5 °C.
- 2. UN Sustainable Development Goals (SDGs):** Adopted in 2015, the 17 SDGs provide a blueprint for balancing growth, equality, and environmental protection.
- 3. National Environmental Policies:** Many nations, including India, have established frameworks like the National Green Tribunal (NGT) and Environmental Impact Assessment (EIA) to monitor ecological health.

## Corporate Social Responsibility (CSR)

Companies are increasingly mandated to invest in sustainability-reducing emissions, adopting green supply chains, and fostering social equity.

**Discussion:** Integrating Environment and Development True sustainability requires integrating ecological considerations into every sector-agriculture, industry, transport, and education.

Technological innovations like green hydrogen, electric vehicles, precision farming, and carbon capture represent promising solutions.

However, without political will and citizen participation, sustainable development remains a distant goal.

Education and awareness are critical. Environmental ethics must be instilled through curriculum reform, while indigenous knowledge should inform modern policy design.

## Conclusion

The 21st century stands at a crossroads. Humanity's progress has come at a heavy environmental price. Sustainable development provides the only viable pathway for ensuring both human prosperity and ecological balance.

This research underscores that the path forward demands global cooperation, scientific innovation, ethical governance, and citizen engagement.

The environment cannot be seen in isolation-it is the foundation of all development. A sustainable 21st century is possible only if policy and practice align toward protecting our shared planet.

## References

1. Brundtland Commission. Our common future. Oxford:

- Oxford University Press; c1987.
2. Sachs JD. The age of sustainable development. New York: Columbia University Press; c2015.
  3. Stern N. The economics of climate change: the Stern review. Cambridge: Cambridge University Press; c2007.
  4. Rockström J, *et al.* A safe operating space for humanity. *Nature*. 2009;461:472–475.
  5. Raworth K. Doughnut economics. London: Random House; c2017.
  6. United Nations Development Programme (UNDP). Human development report 2020: the next frontier. New York: UNDP; c2020.
  7. Intergovernmental Panel on Climate Change (IPCC). Sixth assessment report: climate change 2023. Geneva: IPCC; c2023.
  8. European Commission. The European Green Deal. Brussels: European Commission; c2019.
  9. Government of India. National solar mission progress report. New Delhi: Government of India; c2021.
  10. World Bank. Sustainability and development overview. Washington, DC: World Bank; c2021.

**Creative Commons (CC) License**

This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY 4.0) license. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.