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Developed India @2047 and Environmental Sustainability: A Review

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Abstract

India is country, growing at fast rate and emerging as super power. Environmental sustainability is an integrated process to use natural resources wisely along with environmental conservation and it has emerged as a critical policy and developmental focus in the world as well as in India. It is driven by rapid rate of industrialization, urbanization, and population growth. India is most young country with highest percentage of youth. This article explains India's progress, challenges, and policy responses toward achieving environmental sustainability along with economic growth and Industrialization. It highlights major sectors—energy, water, agriculture, waste management, and biodiversity—while assessing the effectiveness of recent government initiatives under national and international commitments such as the Paris Agreement and Sustainable Development Goals (SDGs).

Key words: - Urbanization, Industrialization, Sustainability, Environment, Biodiversity.

Introduction

India, home to over 1.46 billion people i.e. it is youngest country with highest young resources, faces a dual challenge: ensuring economic growth while maintaining environmental / ecological balance. Environmental degradation by anthropogenic actions are manifested through air, soil and water pollution, deforestation, biodiversity loss, and climate change—poses a significant threat to sustainable growth and development. The government and civil society have increasingly recognized the need for integrating sustainability into economic planning, urban development, industries development and environment protection. Different types of Government bodies like – Ministry of Environment, Forest and Climate change (MoEFCC), Ministry of New and Renewable Energy (MNRE), Ministry of Heavy Industries (MoHI) Scheme to promote Electric Vehicles and Central Pollution Control Board (CPCB) are planning and working in the direction of India's sustainable development by targeting India @ 2047.India has established framework on behalf of United Nation's Sustainable development plan and has set up national action plan with 2030 Agenda. India has committed to climate action plan under its Nationally Determined Contribution (NDC) under Paris Agreement.

- India has goal to achieve carbon neutrality while balancing developmental need **(Net Zero by 2070).**
- India has target for 50% of electrically installed capacity from non-fossil fuel sources by **2030** supported by solar wind and nuclear energy.
- India targets for green hydrogen production at rate of 5 tonnes /annum by 2030.
- Indian government is working to increase forest cover to increase CO_2 sink.
- India has implemented many **wild-life projects** like – **Project Cheetah, Project – Lion** etc.
- **Wet-Land Protection** – India has right now 85 **Ramsar** site and 13 beaches under **Blue-Flag** certification.

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- Through National Solar mission and PM-KUSUM Yojana – India promoting solarization of households and agriculture pumps to provide clean energy and reduce emission.

Like above, many efforts are being made by Indian government to attain green sustainable development and protecting resources for future along with targeting economic growth.

2. Policy Framework and Institutional Efforts

India's sustainability efforts are guided by several policy frameworks and missions:

- **National Action Plan on Climate Change (NAPCC)** (2008): Includes missions on solar energy like Jawaharlal Nehru National Solar mission (JNNSM), enhanced energy efficiency by promoting use of **renewable energy resources**, sustainable agriculture, and water conservation.
- **National Green Tribunal (NGT)**: Judicial body ensuring enforcement of environmental laws and enhancing protection of greenery, Biodiversity and wet-lands.
- **Swachh Bharat Mission (SBM)**: Initiated in 2014 by Indian government, Focuses on sanitation, cleaness and waste management nationwide.
- **National Clean Air Programme (NCAP)**: Targets a 40% reduction in particulate pollution in major cities by 2026. Enforcing shift toward green fuel and energy sources.
- **Panchamrit Goals (COP26)**: Commitments to reach net-zero emissions by 2070 and expand non-fossil energy capacity to 500 GW by 2030.
- **Public Awareness and Education**: Government is promoting different programs to aware public about plant and environment. Environmental issues and importance of nature have been included in syllabus to educate generations for sustainability.

3. Energy and Climate Change

India's energy mix remains dominated by coal (~55%), though the share of renewables is rapidly increasing. As of 2025, renewable energy capacity has surpassed **190 GW**, including solar, wind, and hydro sources. Programs such as the **Pradhan Mantri KUSUM Yojana** promote solar power in Household, commercial shops and agriculture. The transition to green hydrogen and electric mobility further reflects India's commitment to Carbon-Zero goal and environmental sustainability.

However, challenges persist: dependence on coal, grid integration issues, and limited storage infrastructure hinder the pace of clean energy adoption.

4. Water Resources and Sustainable Agriculture

Water stress is one of India's most pressing sustainability issues. Overexploitation of groundwater in states like Punjab, Haryana, and Rajasthan threatens agricultural sustainability and drinking water. Initiatives of Indian government like **Jal Jeevan Mission** and **Atal Bhujal Yojana** aim to ensure water security and recharge groundwater efficiently.

Sustainable green agriculture practices—such as organic farming, precision irrigation (drip/sprinkler), efficient land use and crop diversification—are gaining more attention. Nevertheless, large-scale adoption remains constrained by costs and awareness gaps.

5. Waste Management and Urban Sustainability

Urban India generates over **65 million tonnes** of solid waste annually, much of which remains untreated and discharged as such. The **Solid Waste Management Rules (2016)** and **Plastic Waste Management Rules**

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(2022) encourage separation of garbage at source and their recycling. Cities like Indore and Surat have demonstrated successful models of waste segregation and resource recovery.

Rapid urbanization has strained infrastructure, leading to issues like land issues, air pollution and loss of green cover. Smart Cities Mission integrates sustainability principles into urban planning through renewable energy use, green buildings, e-mobility, and constructions of building with proper planning and greenery.

6. Biodiversity and Ecosystem Conservation

India is one of the **18 megadiverse countries**, harboring rich ecosystems from the Himalayas to coastal mangroves. Protected areas now cover around **5% of India's land area**, with increasing focus on community-based conservation of animals and forests. Programs such as **Project Tiger**, **Project Elephant**, and the **National Biodiversity Mission** aim to conserve species and ecosystems.

However, deforestation, land-use change, and climate impacts continue to threaten habitats and wildlife corridors.

7. Key Challenges

- Population pressure and unsustainable consumption patterns of resources.
- Still Dependency on fossil fuels.
- Weak enforcement of environmental laws in some regions.
- Limited environmental awareness and education in public.
- Balancing economic growth with ecological preservation.

8. Future Prospects and Recommendations

- **Strengthen Renewable Infrastructure**: Promote decentralized solar and storage technologies.
- **Circular Economy Approach**: Encourage recycling, eco-design, and extended producer responsibility.
- **Green Finance**: Expand carbon markets and climate funds to incentivize sustainability.
- **Capacity Building**: Enhance local governance and public participation in sustainability projects.
- **Technology and Innovation**: Foster AI, IoT, and satellite-based monitoring for resource management.

9. Conclusion

India has been engaged in endeavor to attain Environmental sustainability and sustainable development goals (SDGs).Government has made lots of efforts in the sectors of renewable energy, promotion of electric vehicles, use of solar energy and management of solid waste. Educating people by help of different programme and media. India is also combatting with climate change and their challenges. India's journey toward environmental sustainability reflects a complex interplay between economic aspirations and ecological imperatives. While substantial progress has been made in renewable energy, sanitation, and conservation, systemic challenges remain. Achieving long-term sustainability will require collaborative action between government, private sector, and citizens, underpinned by innovation, inclusivity, and resilience. The goal of sustainable development is actually an integrated process and require responsibilities more by people than government.

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