



Sustainable Development through Green Economy: The Indian Outlook

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Abstract

An economic situation that contributes to lowering carbon emissions in the environment is known as a "Green Economy." The green economy aims to reduce environmental risk and resource scarcity while improving human well-being and social justice. It is a substitute for the existing economic model, which may result in inequality, resource scarcity, and environmental hazards. In recent years, one of the main concepts on the global agenda for sustainable development is the green economy. A sustainability report commissioned by the British Government in 1989 was the first to discuss the idea. However, it wasn't until the global economic crisis of the late 2000s that the economy gained international recognition as a recovery strategy that prioritised green job creation, climate change mitigation, and genuine investment.

India's faster growth over the past few decades has created more job opportunities and lifted millions out of poverty. However, deteriorating environmental conditions and a rising

lack of natural resources have cast a shadow over India's impressive growth record. Environmental threats are diverse and

generated by both poverty and prosperity, reflecting the size and diversity of its economy. Businesses and the Government must work together to help India for a transformation to circular economy. The green economy is given a lot of weight in the global sustainable development agenda. India's strong economic expansion over the past few decades has raised living standards and produced job possibilities. However, resource depletion and environmental deterioration limits are useful from the view point of social development. Hence, significant progress towards a green and decarbonised economy is necessary for the society.

In this context, the study attempts to find out the sustainable development strategies for green growth in Indian economy.

Key Words: *Environment, Green Economy, Green Growth, Sustainable Development*

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1. Prelude

A green economy is a clean, environmentally friendly economy that promotes wealth, health, and well-being. Thus, green economy is an economic situation that contributes to lowering carbon emissions in the environment. Sustainable development, which entails expanding our economies in ways that promote social justice and equity while avoiding sacrifices for the environment, is essential to a green economy. The goal is to meet current demands without endangering the standard of living for next generations. The term "green economy" is currently used to describe the Indian environmental perspective. Green economy aims to reduce environmental risk and resource scarcity while improving human well-being and social justice. It is a substitute for the existing economic structure, which may result in inequality, resource scarcity, and environmental hazards. Due to environmental contamination, green development has emerged as the most important priority of a nation.

Every nation must use diverse techniques to implement green growth by encouraging modern changes and providing clarification on current disputes. Green energy has been introduced for norms. Urbanisation is a global phenomenon, but it is rapidly increasing in emerging countries like India.

By 2050, the rate of urbanisation is predicted to have increased to 56% due to its exponential growth. By seizing the opportunities offered by urbanization which is primarily caused by population growth and increased industrialization, emerging markets like India have the ability to completely change their economies. However, the effects of growing urbanisation on climate change are less dramatic. The negative effects of urbanisation include increased pollution (in terms of air, water, and soil), excessive CO₂ emissions from urban cars, spatial congestions brought on by urban sprawl, and ground water depletion due to inadequate management. In addition, population increase in India's largest cities has hazardous effects on climate and atmosphere. Green growth techniques are used to interrupt the cycle of environmental deterioration and the depletion of

natural resources, as well as to promote sustainable growth. Reducing emissions can be accomplished with the lowest possible GDP cost. The Indian economy needs to keep growing in order to achieve its developmental objectives, although expansion may have significant negative effects on the environment since it would deplete natural resources like fossil fuels and mineral water.

In order to improve social fairness and create jobs, green growth can be crucial in balancing India's priorities. Its ability to gradually reduce dependency on the resources needed to sustain economic growth will determine how much of an impact it has. However, the technical initiative needed for green growth may be hampered by controlling the budget deficit and public debt- the two primary obstacles to national policymaking. Furthermore, macroeconomic policy heavily relies on trade balancing. Therefore, it is essential to comprehend the developmental benefits of green growth initiatives in key areas like energy, trade, and income.

2. Review of Literature

Chhaochharia, M. (2021) discussed the global and Indian trends in green finance transactions. On the basis of multiple data sources, the study evaluated both the level of public awareness and availability of financial resources for green initiatives. The findings indicated that while India had made progress in terms of public awareness and financing options, there is scope for improvement in information management system and coordination among stakeholders. Such improvements could help reduce information asymmetry and encourage environmentally responsible and sustainable economic growth. Economic expansion is the driving force behind economic progress, but it had also contributed to pollution and loss of natural resources. **Khor, M. (2021)** emphasised the need to recognise the economic and social values of environmental resources as a key component of the green economy. To promote sustainable development, the green economy places importance on both environmental conservation and financial gains. The conservation of natural resources and the environment are crucial since they are the most valuable assets. Promoters of the green or low-carbon economy argued that protecting the environment should be the top priority in the formulation and implementation of all economic policies. **Melnyk, T., Reznikova, N. and Ivashchenko, O. (2020)** stated that the dynamics of a country's economic greening is crucial because it allows for the assessment of environmental impact of a new economic model by looking at the various contributing factors and determining the best strategies for reducing environmental pressures from economic activity. Numerous global reporting systems relied on energy indices and indicators to evaluate the state of green economy and the potential for green growth. **Soundarrajan, P. and Vivek, N. (2016)**, stated that green investment aimed to raise social justice and human wellbeing while reducing environmental hazards and protecting the environment. Additionally, it recognises the value of environment and its natural resources.

3. Rationale of the Study

The green economy has been a key paradigm for policies that promote sustainable development in both rich and developing nations throughout the last ten years. It is an intriguing paradigm for creating more environmental friendly, low-carbon, socially inclusive communities that use fewer resources. To

achieve green growth, this analysis acknowledges the initiatives and strategies taken up by the Indian Govt. and provides policy implications for a sustainable green economy.

4. Objectives

In the Indian context, the study aims to examine the following objectives:

1. To examine the initiatives taken up by the Government towards green growth.
2. To examine the strategies for achieving green economy.
3. To analyze the national benchmark for green economy.
4. To examine the future outlook of green economy.

5. Methodology

To comprehend the ideas of green growth, sustainable development, and tactics used by the nations for shifting to greener economies, literature analysis has been carried out. Examination of scholarly works, research articles, reports of international organisations, and policy documents pertaining to Indian green growth programs forms the foundation of this paper.

A methodical analysis is adopted to examine the role of green growth in advancing sustainable development in India. For analytical rigor and relevance, the study undertakes a qualitative content analysis to examine the initiatives and strategies of green growth for sustainable development in India. Finally, a benchmark analysis has been conducted in order to bridge the gap between theory and policy practice related to green growth.

6. Discussion and Analysis

Government Initiatives with respect to Specific Resources for Green Economy

- **Solar Energy:** By increasing the budgeted allocation to 100 billion (in INR) from 48 billion (in INR) in 2023–2024, the PM Surya Ghar Mult Bijli Yojana has been a commendable initiative to promote subsidised installation of roof top solar panels for 10000000 households along with free electricity up to 300 units per month.
- **Green Hydrogen:** In January 2023, the Union Cabinet authorised a policy initiative called the National Green Hydrogen Mission (MGHM). Under the direction of MNRE, the project seeks to establish India as a world leader in the production, use, and export of green hydrogen by 2030. This program is a component of India's larger endeavours to lower its carbon footprint and switch to sustainable energy sources.
- **Nuclear Energy:** The development and implementation of Bharat Small Reactors (BSR) are planned which are tiny nuclear reactors intended for captive power generation.
- **Thermal Energy:** Establishment of an Advantaged Ultra-Super Critical (AUSC) thermal power plant is the main goal of the joint venture between Bharat Heavy Electronics Limited (BHEL) and NTPC. The 800 mega watt AUSC power plant that will be constructed up as part of this project has the primary advantage of achieving lower emissions and higher thermal efficiency as compared to the traditional thermal power plants.
- **Deep Ocean Mission:** Along with conducting surveys and explorations of the deep ocean, the mission would also implement programs aimed at preserving the biodiversity of the deep sea. Within five years, this program would receive a budget allocation of more than INR 4000 crore.

- **Urban Swachh Bharat Mission 2.0:** The government intends to effectively manage waste from construction and demolition activities and bio remediate all inherited landfills, with a focus on integrated management of manure sludge, sewage, waste source categorisation, reduction of disposable plastic, and pollution reduction.
- **Consumer Preference for Greener Products:** Younger people know about sustainable items. According to a recent research, customers favour purchasing goods from businesses that prioritise reducing waste, carbon emissions, using sustainable packaging, adhering to moral labour standards, and protecting human rights. People are now more environmentally conscious as a result of the pandemic. A number of FMCG players have chosen sustainable packaging materials and have shown a commitment to sustainable development. Aiming to achieve 100% sustainable packaging by 2025, the top 10 consumer goods corporations (Donane, Coca-Cola, Pepso Co., Unilever, and L'Oreal) established an ambitious aim in 2020.

Government Initiatives to boost Investment in the Green Economy

- **Climate Taxonomy:** To increase the amount of money available for climate adaptation and mitigation, the Government has suggested for creating climate taxonomy. It is a system that categorises which sectors of the economy can be designated as sustainable investment for climate finance taxonomy. This method serves as a benchmark to direct investors towards validated projects and lowers the risk of green washing. They barely make up about 3% of all foreign direct investment inflows to India. The need to draw foreign investment is the driving force behind this deficiency. Additionally, a standardised system makes it simpler by guaranteeing uniformity across different projects and sectors.
- **Viability Gap Funding (VGF):** In order to facilitate the initial expansion of offshore wind energy capacity up to 1 GW, VGF was incorporated in the interim budget. The government uses VGF as a financial tool to encourage economically justified projects that might not be financially feasible because of large initial capital expenses. The Government has used VGF for a number of infrastructure projects in past budgets, but the emphasis on VGF for RE projects is a more recent development that broadens the use of VGF to these new and developing industries.
- **Transfer to Sovereign Green Fund:** The amount transferred to the Sovereign Green Fund was increased by INR 5000000000 in the budget, for a total of INR 17000000000. A Government-managed investment fund that has been designated especially for funding initiatives with favourable environmental effects is known as sovereign green fund. This increase shows that the administration is committed to increasing the amount of money available for green projects.
- **Enhanced Credit Availability:** By encouraging banks and financial institutions to provide better credit terms and preferential rates for projects that support the nation's environmental sustainability goals, the budget also highlights the necessity for financial institutions to support green projects through increased credit availability measures.

Green Economic Strategies in India

The funding allotment for several initiatives has increased significantly in an effort to encourage the expansion of renewable energy sources. This exceptional rise in government spending on green projects marks a major advancement in India's attempts to decarbonise its economy. The economic strategies for green growth in Indian context are briefly highlighted below.

- **Financing a Green Energy Transition:** As part of its climate strategy, India has promoted Panchamrit and lifestyle for the environment as development paradigms. Together, these suggest a sustainable development approach to decouple environmental degradation and economic growth. The budget focuses on accelerating the transition to non-fossil electricity (i.e., notably solar and hydrogen), decarbonising the transportation sector, and financing this new infrastructure using green bonds.
- **Non-fossil Electricity:** Compared to the previous year (2022-2023), the budgeted allotment for more renewable electricity has increased by over 50%. The nation's renewable capacity has grown quickly; even with the comparatively little allocation in the previous years. The budgetary allotment for solar power is 644.15 million US dollar, which represents 54 % rise over the previous year's allocation, while the wind power sector saw a boost at 15.6 %. Additionally, there has been a significant rise in budgeted allocation (42%) to the two nuclear electricity producing businesses. Partial financial support is being provided for grid integration for new renewable energy projects that are planned to be established in the countries sparsely populated high altitude desert in the north. A significant plan to build 23 gigawatts of ultra-mega solar PV plants in Ladakh has already been declared by the government. The budget (2023-2024) includes \$1 billion for the construction of the transmission line and the integration of 13 GW of this project into the national grid. Among other noteworthy projects, a plan for pumped hydro storage will be developed and batteries with a 4 GW hour capacity can now access viability gap funding. The largest budgeted commitment for the energy transition project along with the Ministry of Petroleum and Natural Gas is just over \$4.2 billion for 2023–2024.
- **National Hydrogen Mission:** In order to replace fossil fuels, India has started a national hydrogen initiative that aims to produce 5 million tonnes of green hydrogen by 2030. This mission's main goal is to integrate Green Hydrogen with natural gas in the municipal gas distribution network in order to partially replace the use of natural gas in urban areas. It aims to reduce the use of fossil fuels in industries like steel by substituting hydrogen-based synthetic fuels in the transportation sector. The initial funding commitment for the national green hydrogen mission is 36 million dollars for the financial year 2023–2024. However, it is quite small when compared to other countries' hydrogen projects. Although this sum is probably going to be distributed over a number of years, the budget speech and the hydrogen mission materials show a 2.4 billion dollar commitment for the mission.
- **Electric Mobility:** The budget (2023-2024) includes a number of ideas to encourage electric mobility. India's

flagship program, For Faster Adoption and Manufacturing of Electric Vehicles (FAME), offers financial assistance for the purchase of electric vehicles (EVs). Compared to the previous year, this budget almost doubles the amount allotted for this project to more than 600 million dollars. Considering how rapidly EV adoption has grown in India, where FAME funding has previously expanded, this rise is expected to further increase EV adoption in the coming year. Import taxes on machinery used in the production of lithium-ion batteries for EVs have been eliminated in an effort to promote the growth of domestic EV manufacturing sector. By reducing the customs duty rates on imported batteries from 21% to 13%, a simplification of the import tax structure would cut the initial cost of EVs. The on-going implementation of the strategy outlined in the 2021–2022 budgets to phase out government vehicles that are more than 15 years old is another crucial step in lowering the percentage of fossil fuel vehicles utilised by government organisations.

Additionally, a substantial investment of almost \$1 billion is suggested for the electrification of the Indian railways. Indian Railways wants to electrify the whole broad gauge network in order to reach net zero carbon emissions by 2030. Nearly India's entire railway network is broad gauge, and by November 2022, 82% of it had already been electrified.

- **Delivering on Green Growth:** Increased funding for the construction of green infrastructure, particularly in the areas of transport and power, should accelerate the transition to sustainable development, which is embodied in Life and Panchamrit. By increased funding for important efforts like expansion of renewable electricity production and the sale of EVs, the budget (2023–2024) is reaffirming its support for green initiatives year after year. Additionally, the budget has decided to fund the building of long-term infrastructure, including the new national hydrogen mission and the Ladakh transmission line. In addition to offering producers and customers reduced taxes on eco-friendly goods like EV batteries, it would mandate the dumping of old automobiles.

National Benchmark for Green Economy in India

Renewable Energy Targets

- 500 GW non-fossil fuel capacity by 2030.
- Current capacity ~232 GW (2025).

Indicator:

- % of energy from renewable sources.
- Carbon intensity of GDP.

Net-Zero Target

- India aims for net-zero emissions by 2070.

Benchmark indicators:

- CO₂ emissions per capita.
- Emission intensity reduction.

Green Economy Size & Investment

- Projected:
 - \$1 trillion green economy by 2030.

Current Nominal GDP: ~₹357 lakh crore.
≈ \$3.9–4.0 trillion.

Indicators:

- Share of green sectors in GDP.
- Volume of green finance.

Green Jobs Benchmark

- Expected: 7.29 million jobs by 2028.
- India currently has ~18–20 million green jobs (baseline estimate from earlier reports).

Indicator:

- % of workforce in green sectors.

Circular Economy Metrics

- Recycling rates.
- Waste-to-energy conversion.
- Resource efficiency.
- Presently, E-waste recycling remains below 50%. Therefore, it indicates scope for improvement in the near future.

Future Outlook of Green Economy in India

- 45% reduction in its GDP's emission intensity by 2030.
- By 2030, cutting the anticipated total amount of carbon emissions by one billion tonnes.
- By 2030, approximately 50% of installed capacity for electric power should come from non-fossil fuel-based energy sources.
- To have 500 gigawatt of renewable energy installed by 2030.
- To have a production of 500000 tons of green hydrogen by 2030.
- The Govt. of India has increased the fund to 191 billion from 128 billion for the purpose of increasing the capacity of renewable energy.

7. Conclusion

The evolution of green economy is in line with the global sustainable agenda. Both corporate involvement and political engagement are essential to accelerate a sustainable transformation. A solid basis for India's green growth is established by the federal budget in the financial year 2023–2024 which covers industries like energy and agriculture. Although, it must manage the climate issues brought out by the growing urban population, India is well-positioned to take advantage of the opportunities presented by this shift as urbanisation soars. Indian methods include impact programs like green finance program, car scraping policy, and Gobardhan Yojana. The green growth path of India is a complex undertaking that includes sustainable practices, clean mobility, and renewable energy. The nation's dedication to technology-driven solutions is demonstrated by its support of initiatives like the national green hydrogen mission. India continues to advance its economy while keeping an eye on the environment and working towards a future with net zero carbon emissions. Economic and environmental recovery must coexist in the global economy. Priority should be given to investments in industries that support sustainable growth and laws aimed at reducing social and health inequalities. This

study emphasises that green growth is a holistic and flexible approach that combines economic development, environmental stewardship, and societal progress rather than just being a substitute for sustainable growth. India is positioned to promote a peaceful coexistence of economic prosperity and ecological sustainability through its green growth route. With significant expenditures and forward-thinking initiatives in renewable energy, electric mobility, and sustainable infrastructure, the budget (2023-2024) strengthens the foundation for the nation's green transition. Further, the budget (2023-2024) lays the basis for a more robust and independent energy industry by emphasising innovation, domestic production, and opening the doors for long-term prosperity.

Policy Implications

In India, a green economy can have a big impact on the country's economy by generating new jobs in the fields like sustainable agriculture, waste management, and renewable energy, encouraging energy independence, encouraging foreign investment, lowering pollution, enhancing public health, and promoting sustainable livelihoods. It can also help mitigate climate change by lowering carbon emissions. However, shift to a green economy may involve a large amount of investment and changes to the policies that encourage green practices and technologies.

The imperative implications of India's green economy are outlined below.

Employment Opportunity: The creation of new jobs in industries like solar power, electric vehicle manufacturing, energy efficiency improvements, and sustainable farming is a significant potential advantage that can address unemployment issues.

Economic Growth: By fostering innovations, opening up new markets and sectors, attracting foreign capital, investments in green infrastructure and technologies can spur economic growth.

Energy Security: By reducing dependency on fossil fuels, switching to renewable energy sources like wind and solar can provide energy security and price stability.

Environmental Impact: Public health can be enhanced by adopting green practices which can drastically lower pollutants, enhance air quality, and minimize the effects of climate change.

Rural Development: Rural communities can be empowered and inclusive growth can be fostered through initiatives like renewable energy projects and sustainable agriculture.

Market Opportunities: Growing consumer demand for environmentally and friendly products provides opportunities to the companies to create and promote sustainable products and services.

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