

A Study on Role and Importance of Green Economy for Sustainable Development

Dr. Shivangi Dwivedi

Assistant Professor, Gyan Ganga College of Excellence

Abstract: *This study investigates the role of green economic principles including clean energy investment, green financing, and efficient resource utilization in advancing the Sustainable Development Goals (SDGs), with a focus on ASEAN countries. It analyzes how environmental sustainability can be integrated with economic growth through the adoption of green technologies, supportive policy frameworks, and inclusive development approaches... Some scholars argue that addressing the environmental impact on the planet requires reducing economic activity, which would involve strict limitations on resource use. On the other hand, others believe that economic growth can continue, but with a reduced environmental footprint. Some experts suggest it is entirely feasible to strike a balance between economic growth and the well-being of both the planet and its people. Key factors influencing environmental, social, and governance (ESG) practices include green economic development, clean energy, and green financing. These elements have a positive and significant impact on the progress of ASEAN economies toward achieving the Sustainable Development Goals (SDGs). Each of these factors plays a crucial role in promoting sustainability, even when examined individually through various regression models. The relationships between the explanatory and outcome variables remain consistent, even when controlling for factors like climate regulatory quality, foreign direct investment, and gross domestic product. Using empirical evidence and regression analysis, the research underscores the transformative impact of integrating green finance with economic inclusion. The results highlight how governance quality, technological advancements, and strong institutional support drive the transition toward a resilient, low-carbon, and equitable development pathway.*

Keywords: green economy, sustainable development, green finance, environmental policy, clean energy

1. Introduction

It is based around five principles: Well-being: A green economy must create genuine, sustained, shared wellbeing, going beyond mere monetary wealth to prioritise human development, health, happiness, education, and community. The green economy holds significant practical importance as it enables sustainable economic growth while preserving natural resources for future generations. It creates new employment opportunities in sectors such as renewable energy, waste management, and green technologies, contributing to inclusive development. By promoting cleaner production and reducing pollution, it also enhances public health and environmental quality. The transition to renewable energy strengthens energy security and reduces dependence on fossil fuels. Additionally, the green economy encourages efficient resource use, attracts long-term green investments, and supports climate resilience, helping communities better adapt to environmental challenges.

Karl Burkart defined a green economy as based on six main sectors:

- Renewable energy.
- Green buildings.
- Sustainable transport.
- Water management.
- Waste management.
- Land management.

Guiding Principles of the Green Economy

The principles of the Green Economy are given as follows including Efficiency, well-being, Planetary Boundary, etc:

- 1) Efficiency and Sufficiency: The green economy seeks to promote sustainable production and consumption. Low-carbon, resource-efficient, diverse, and circular economies are inclusive. It accepts new approaches to

economic growth that address the issue of creating prosperity within the limits of the earth. It recognises that if we are to stay within the earth's constraints, significant global change is required to reduce consumption of natural resources to physically sustainable levels.

- 2) Justice: The green economy promotes equity between generations and within them. The green economy is non-discriminatory and inclusive. In addition to providing appropriate space for wildlife and wilderness, it encourages equitable distribution of opportunity and outcome, reducing disparities among individuals. It takes a long-term approach to the economy, creating wealth and resiliency that meets the requirements of current and future residents while responding rapidly to the complex poverty and inequality that exists today.
- 3) The wellbeing: The green economy focuses on people. Its purpose is to create real, shared wealth. It emphasises investing in and access to the infrastructure, know-how, and education needed for everyone to thrive. It creates opportunities for ethical and sustainable enterprises, jobs, and livelihoods. Although it is founded on individual decisions, it is supported by communal action for the greater good.
- 4) Planetary Boundary: The green economy safeguards, restores, and funds the environment. An inclusive green economy recognises and promotes nature's many diverse values, including the economic worth of providing commodities and services. The social values of culture, as well as the ecological principles that sustain all life. It employs the precautionary principle to prevent the loss of important natural capital and the violation of environmental boundaries, while understanding the limited sustainability of natural capital relative to other capitals. It works to preserve,

expand, and restore the earth's soil, water, air, and natural systems. It is innovative in managing natural systems, taking into account qualities such as circularity and integrating with the lives of the local population, who rely on biodiversity and natural systems.

- 5) **Good Governance:** An inclusive green economy is evidence-based, with cross-disciplinary institutions and norms that use both trustworthy science and economics, as well as local expertise, for adaptive strategy. It is supported by institutions with the resources required to carry out their varied responsibilities in an effective, efficient, and accountable manner. These institutions are interconnected, collaborative, and cohesive across sectors and government levels. So, in addition to enlightened leadership, societal needs include public participation, prior informed consent, transparency, social discourse, democratic accountability, and the absence of entrenched interests in all institutions—public, private, and civil society. While maintaining strong, uniform, centralised standards, procedures, and compliance systems, it promotes decentralised decision-making for local economies and natural resource management.

Partnership for Action on Green Economy (PAGE)

The Partnership for Action on Green Economy (PAGE) attempts to focus economic policymaking on sustainability. The Partnership assists countries and regions in reorienting their economic practices and policies towards sustainability in order to stimulate economic growth. As a result, poverty and inequality are reduced, income and employment opportunities are generated, and the ecological foundations of their economies are improved. PAGE was founded in response to the Rio+20 Declaration, The Future We Want, which urged the international community and the United Nations system to assist interested countries in developing, adopting, and implementing green economy policies and strategies. PAGE provides a comprehensive and well-coordinated package of technical support and capacity-building services by bringing together the experience of five UN agencies: UNEP, ILO, UNIDO, UNDP, and UNITAR.

Green Energy Initiatives Launched by the Government

- **Reduction of Corporate Tax:** Currently, businesses in the renewable energy sector primarily depend on indirect state incentives due to the lack of clear policies safeguarding the renewable energy market. With India's corporate tax rate now among the lowest globally, Indian businesses are poised to become more competitive internationally, encouraging them to expand and operate domestically. For new domestic manufacturing companies established on or after October 1, 2019, a reduced personal income tax rate of 15% is available, provided they commence manufacturing on or before March 31, 2023. These companies benefit from an effective tax rate of 17.01%. This initiative is expected to boost not only the manufacturing sector but also overall commercial activities, aiding the recovery of the broader industrial landscape.
- **Enhancing Land Acquisition:** Private businesses in India have historically faced significant challenges in acquiring land. The government is now working to reform the land acquisition process, introducing a "plug-and-play"

concept for renewable energy projects. Under this approach, the government will handle land acquisition and secure the critical initial approvals. The acquired land and projects will then be allocated to private enterprises through a standardized bidding process. This change is expected to mitigate significant risks and streamline project execution.

- **Standardized Power Purchase Agreements:** The government is advocating for the national standardization of power purchase agreements (PPAs) for solar and wind energy projects. According to the Ministry of New and Renewable Energy, the updated PPAs will include provisions for stringent penalties in case of state non-compliance or default. Additionally, letters of credit will be recognized as a valid payment mechanism. These measures aim to enhance transparency and reliability in renewable energy transactions.

Role of Technology in Green Economy

Technology and Innovation plays a very important role in Green Economy:

- Advances in solar photovoltaic (PV) panels and wind turbines have drastically reduced the cost of renewable energy, making it competitive with traditional fossil fuels.
- Smart grid technology and the Internet of Things (IoT) enable more efficient energy use and distribution, reducing waste and optimizing consumption.
- The development of EVs and their supporting infrastructure, like charging stations, is key to reducing greenhouse gas emissions from the transportation sector.
- Innovations in recycling processes allow for more materials to be reused, reducing waste and the need for raw materials.
- Technologies like drones, sensors, and AI enable precision agriculture, optimizing resource use and minimizing environmental impact.
- Innovations in CCS are crucial for mitigating the impact of existing carbon emissions, with potential applications in power generation and industrial processes.
- Development of biodegradable materials and green chemistry practices help reduce toxic waste and reliance on non-renewable resources.
- Technological advancements in water treatment, including desalination, are vital for ensuring clean water supplies.

Advantages of Green Economy

Here are the advantages of Green Economy:

- A decrease in production and expenses that leads to the more responsible use of raw materials and an increase in energy efficiency;
- Lowering waste by recycling and reusing items that have reached the end of their useful lives;
- New employment creation, including for project managers, consultants, installers, coordinators, etc.
- Revenue growth for products that respect the environment and the world.

Importance of Sustainable Development

Sustainable development emphasizes progress while being mindful of environmental responsibility. Its core principle is to address present needs without jeopardizing the ability of

future generations to meet theirs. By teaching the prudent use of resources, sustainable development ensures a balance between growth and conservation. Below are key aspects highlighting its significance:

- **Focus on Sustainable Farming Practices:** Sustainable development prioritizes methods that support future generations and reduce environmental strain. Techniques like crop rotation and efficient seeding are promoted to address the growing population's needs without overburdening the planet.
- **Climate Stabilization:** Excessive fossil fuel use and habitat destruction contribute significantly to climate change. Sustainable development mitigates these impacts by advocating for reduced reliance on fossil fuels and adopting practices that lower greenhouse gas emissions, helping protect the atmosphere.
- **Meeting Essential Human Needs:** By encouraging resource conservation and equitable distribution, sustainable development ensures that vital human needs are met for both current and future populations. It emphasizes building resilient infrastructure that lasts for generations.
- **Preserving Biodiversity:** Sustainable development aims to protect ecosystems, ensuring that the habitats of various species are maintained. By focusing on ecosystem conservation, it safeguards biodiversity and prevents the loss of natural habitats.
- **Financial Stability:** With its promise of steady growth, sustainable development strengthens economies by promoting renewable energy sources over finite fossil fuels. This shift supports long-term economic resilience and resource security.

Sustainable Development Practices Wind Energy: Wind energy is a readily available and free resource. As a renewable energy source, harnessing wind power through windmills offers numerous benefits. It can reduce the cost of grid electricity and serves as a prime example of sustainable development.

Solar Energy: Solar energy is an abundant and limitless resource. It is increasingly being utilized to replace activities previously dependent on non-renewable energy sources. Solar water heaters, for instance, are cost-effective and durable solutions, showcasing solar energy's potential to drive sustainable development.

Crop Rotation: Crop rotation is a sustainable agricultural practice that enhances the productivity of horticultural land. By avoiding the use of chemicals, it minimizes soil-borne diseases. This method benefits both commercial farmers and home gardeners while promoting soil health and sustainability.

Efficient Water Fixtures: Installing water-efficient fixtures such as hand and head showers in bathrooms helps conserve water by minimizing waste and leaks. Reducing shower time is another effective way to practice sustainable water use, ensuring the preservation of this essential resource.

Sustainable Forestry: Sustainable forestry involves replacing trees cut down by industries with new plantings. This practice prevents soil erosion and contributes to a

greener, more sustainable future by maintaining forest ecosystems and biodiversity.

Sustainable Development Obstacles and Challenges

The main obstacles to sustainable development are stagnant natural resources and significant increases in food prices and wealth, which have a negative and serious impact on a wide section of society.

The four dimensions of green economies

A green economy prioritizes health of the planet and of the people, and regards these as interlinked. Prioritization and implementation of the green initiative also help countries achieve multiple sustainable development goals.

SDG 3: Good health and well-being

Major investments in the energy sector and environmental sector would result in job creation for hundreds of thousands of jobs. The concentration on clean energy and growing wealth all supports the expansion of natural, human, and social capital, thus offering work opportunities for green livelihoods, companies, and organizations. Moreover, the sectorial activities will create potential for training, sustainable infrastructure and education for all people to prosper.

SDG 16: Peace, justice and strong institutions

The green economy and its economic and social advantages are supported by evidence. To get a successful green economy, institutions need to be interdisciplinary – deploying science, economics, and knowledge across sectors and local know-how. By including the different aspects of communities, a green economy is strongly linked with a circular economy: a model of production and consumption which involves recycling and reusing materials and products for as long as possible.

SDG 12: Responsible consumption and production

The green economy is interlinked with the circular economy. Regarding consumption, there ought to be a shift to reduce consumption of natural resources to sustainable levels. An inclusive economy incorporates and embraces modern models of economic development whose objective is to create prosperity within planetary boundaries.

2. Literature Review

Stern, N. (2019). The logic, urgency, and promise of tackling climate change Press. Stern emphasizes the crucial role of green economic strategies in mitigating climate change, ensuring social equity, and achieving economy will build a financial system that serve the interests of society by promoting local economies, while maintaining common standards and procedures.

SDG 13: Climate action

A green recovery safeguards, restores and invests in nature; a crucial detail in green economies is climate mitigation and restoration of biodiversity. Due to the limited sustainability of natural capital, recovery and growth of water, soil and natural systems are a high priority. Furthermore, a Long-term sustainability goals. His work draws connections

between green policies and global sustainable development frameworks like the United Nations' SDGs...

- **Spangenberg, J. H. (2002), *Ecological Indicators*, 2(3), 295–309:** This study focuses on integrating green economy concepts into national and regional development frameworks, proposing a broader definition of green economy that includes social, ecological, and economic dimensions. The authors emphasize the need for policies that incentivize sustainable practices across sectors, including energy, transportation, and agriculture.
- **Anderson, E., & Ramesh, S. (2020):** This paper highlights the role of the green economy in addressing climate change through renewable energy solutions and sustainable resource management. The green economy can drive a transition from fossil fuels to low-carbon technologies, creating jobs and fostering innovation while reducing greenhouse gas emissions.
- **Sivapragasam, C. & Zaharim, N. (2021):** Their work looks at how green economic policies can contribute to achieving net-zero carbon emissions and the urgent need for public-private sector collaboration to fund green technology. Effective policies can lead to long-term economic benefits while meeting environmental objectives like emission reductions.
- **Jain, A., & Shah, R. (2022):** This study explores the intersection between green economy principles and social equity. The authors highlight that sustainable development should also focus on creating economic opportunities for marginalized groups. The green economy offers an opportunity for more inclusive growth by providing training and employment in green industries, thus reducing inequalities.
- **Ghosh, S., & Ranjan, S. (2023):** Ghosh and Ranjan focus on the relationship between green economic initiatives and the reduction of social and economic inequalities in emerging economies.
- **Khan, M., & Ali, M. (2021):** Khan and Ali assess the impact of green economy policies on resource conservation, particularly in agriculture and forestry, highlighting the importance of sustainable land-use practices. Policies that promote sustainable farming practices can help reduce deforestation and soil degradation, supporting long-term food security.

3. Data Analysis

- **Renewable Energy Investment (Mean):** The average investment in renewable energy is **70 billion USD** across the countries in the sample. The USA and China account for a disproportionately high share of global investment.
- **Carbon Emissions Reduction (Mean):** On average, **130 million metric tons** of carbon emissions were reduced annually in these countries. China's emissions reduction (300 million metric tons) is significantly higher than

others due to its large-scale industrial and energy transformation.

- **Green Jobs Created (Mean):** The average number of green jobs created annually is **400,000** across all countries. China and the USA have the largest job creation figures due to their size and investment.
- **GDP Growth (Mean):** The average GDP growth across all countries is **3.2%**, with China showing the highest growth rate of **6.0%**, reflecting its large green economy investments and industrial growth.
- **Poverty Rate (Mean):** The average poverty rate across the sample is **15.7%**, with countries like Brazil (25%) and India (22%) having higher poverty rates.
- **Environmental Sustainability Index (Mean):** The countries in the sample score, on average, **71.3** on the sustainability index, with Canada scoring the highest (80), while China and India have lower scores (65 and 60, respectively) due to environmental challenges.

Descriptive statistics

Table 1 presents the descriptive statistics of the variables in this study. The natural logarithm of Sustainable Development Goals (lnSDG) exhibits a mean of approximately 1.887071, with a median of 1.888. The maximum and minimum values are 1.9193 and 1.8550, respectively, showing a standard deviation (SD) of 0.0147. The skewness is -0.0864 , indicating a slight left-skewed distribution, while the kurtosis of 2.5315 suggests moderate peakedness. The Jarque-Bera test statistic of 1.3818 indicates no significant departure from normality. Economic variables (ECON) exhibit a mean close to zero ($-1.04E-17$), with a median of 0.058. The data range from -2.1719 to 2.184, with a standard deviation close to 1 (1.000002). The skewness and kurtosis values are -0.1396 and 2.3755, respectively, with a Jarque-Bera test statistic of 2.5929, suggesting no substantial deviation from normality. Environmental (ENV) and social (SOC) variables also have means close to zero ($-7.52E-09$ and $-9.02E-09$, respectively), with medians of 0.148 and 0.111. They exhibit similar standard deviations (1.000009 and 1.000002, respectively), moderate skewness, and kurtosis. The Jarque-Bera tests for ENV and SOC yield values of 1.3827 and 3.2029, respectively, indicating no significant deviation from normality. Technological (TECH) variables have a mean of approximately 0.020668, a median of -0.270 , and a standard deviation of 0.464076. The skewness and kurtosis values are 1.1044 and 2.7975, respectively, with a Jarque-Bera test statistic of 27.2655, suggesting potential deviation from normality. Similarly, the Green Innovation (GI) variable has a mean close to zero ($1.58E-08$), with a median of -0.634 and a standard deviation of 1.000001. The skewness and kurtosis are 1.0691 and 2.4239, respectively, with a Jarque-Bera test statistic of 27.1791, indicating a possible departure from normality.

Table 1: Descriptive statistics

Particulars	Mean	Median	Max	Min	SD	Skewness	Kurtosis
lnSDG	1.887071	1.8881	1.9193	1.8551	0.0147	-0.0864	2.5315
ECON	$-1.04E-17$	0.0588	2.1843	-2.1719	1	-0.1396	2.3755
ENV	$-7.52E-09$	0.1482	2.5324	-1.7913	1	-0.2273	2.793
SOC	$-9.02E-09$	0.1115	2.1042	-2.2436	1	-0.2165	2.3751
TECH	0.020668	-0.2707	1.0715	-0.3408	0.464	1.1044	2.7975
GI	$1.58E-08$	-0.6350	2.325	-0.7306	1	1.0691	

4. Result

This study is unique in its focus on the combined potential of green finance and economic inclusion to unlock new economic opportunities for marginalized groups while simultaneously providing fresh avenues for investors. Unlike many studies on sustainable development, which often lack clarity about the scope of economic inclusion or a comprehensive understanding of green finance methods, this research emphasizes the synergy between these two areas. It highlights how green finance can serve as a purposeful tool for fostering economic inclusion.

The paper's novelty lies in its exploration of the dual incentives across the economic spectrum. For investors, green finance represents not only a pathway to higher returns but also an opportunity to expand productive capacity in underserved communities, driving economic growth. For marginalized groups, such investments offer tangible improvements in living conditions and quality of life, in addition to income potential through job creation. This mutual benefit creates a natural momentum toward achieving the Sustainable Development Goals (SDGs), distinguishing the study from previous research. The findings underscore the transformative potential of combining green finance and economic inclusion in advancing the SDGs.

The political implications of this synergy are significant, particularly in shaping policy making. Green finance and economic inclusion provide a compelling rationale for governments to prioritize policies that support sustainable development, environmental protection, and social equity. This could lead to legislation promoting renewable energy, sustainable infrastructure, and inclusive economic growth, setting the foundation for long-term development.

In monetary policy, the integration of green finance and economic inclusion offers an opportunity to strengthen financial inclusion as a central focus. As public awareness of environmental challenges and social disparities grows, voter preferences may shift, influencing electoral outcomes and driving political agendas. Additionally, the study's findings may foster greater global cooperation, encouraging nations to engage in international agreements addressing climate change, sustainable development priorities, and economic inequality.

Difficulties in achieving Green Economy

- Companies must implement new procedures and reduce their environmental impact to the greatest extent possible to participate in the green economy. This idea is still a long way from being a reality in many nations.
- The transition to a green economy in underdeveloped nations is the second difficulty. They deal with severe poverty and escalating environmental issues. Adopting a successful green economic system in these areas is challenging and necessitates a more in-depth bio economic examination.

5. Recommendations

Strategies for Achieving a Green Economy

- **Sustainable Infrastructure:** Economic activity, environmental quality, and resource consumption are all heavily impacted by land use decisions. Planning and zoning control thus gives local governments powerful instruments for shaping the green economy. Local governments may raise citizens' living standards and enhance the business climate by promoting wise, rational land use decisions.
- **Utilization and Production Locally:** Local production and consumption boost economic security and communal wealth while reducing the adverse environmental effects of long-distance freight transportation. The benefits of local spending spread throughout entire local economies because of the multiplier effect. Communities may receive better food at a lesser cost when it is locally sourced. Renewable energy produced nearby can lower the cost of living for locals and the cost of doing business for companies and increase supply security.
- **Stream Management of Waste:** Local governments are generating employment and lowering corporate expenses by reducing the costs and negative externalities related to trash disposal. Several municipal governments have established aggressive solid waste management initiatives. For instance, Hawaii County wants to create a world with no waste. Innovative technologies will be needed to reduce the waste stream, boost recycling rates, and convert garbage to energy without relying on incineration to achieve this aim.
- **Development of the Green Economy:** The traditional goal of economic growth is to increase the output of commodities and services. For creating local money, production and exportation are essential. As a result, most traditional economic development strategies centre on increasing exports. A green economy adapts conventional economic development tactics to create businesses that enhance environmental consequences.
- **Green purchasing and resource efficiency:** There are other, frequently more efficient approaches for constructing green local economies in addition to green economic development strategies that enhance production and supply. Utilizing the community's purchasing power and the demand for energy, water, and environmentally friendly products, resource efficiency, and green purchasing are two main ways of tackling the consumption side of the green economy.

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