

Role Of Sustainable Economic Model in Economic Development Towards Sustainable Future

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Abstract—In recent decades, the concept of green economics has emerged as a critical framework for reconciling economic growth with environmental sustainability. Traditional economic models, which prioritize short-term growth and profit maximization, have increasingly been criticized for their role in environmental degradation, climate change, and resource depletion. In response, green economics offers an alternative paradigm that integrates ecological constraints, social equity, and long-term economic resilience. This review paper examines the relationship between green economics and long-term national competitiveness by synthesizing existing theoretical perspectives, empirical evidence, and policy experiences across developed and developing economies. The study reviews key dimensions of green economics, including green growth, resource efficiency, renewable energy transition, green innovation, and institutional governance, and evaluates how these factors contribute to sustainable national competitiveness. The paper highlights that nations adopting green economic strategies tend to enhance productivity, innovation capacity, investment attractiveness, and social welfare over the long run. However, challenges such as policy inconsistency, financial constraints, and unequal transition costs remain significant barriers. The review concludes by proposing an integrated conceptual framework linking green economics with national competitiveness and identifies future research directions to strengthen evidence-based policymaking.

Index Terms—Green economics, national competitiveness, sustainable development, green growth, environmental policy, long-term economic performance

I. INTRODUCTION

National competitiveness has traditionally been understood as a country's ability to achieve sustained economic growth, high productivity, and improved living standards in an increasingly globalized

economy. Conventional indicators of competitiveness, such as gross domestic product (GDP), export performance, and industrial output, have dominated economic policy agendas for decades. However, these measures often fail to account for environmental degradation, social inequality, and long-term ecological risks that threaten economic stability. As environmental crises such as climate change, biodiversity loss, and resource scarcity intensify, the limitations of growth-centric economic models have become increasingly apparent (Aghion, P et al, 2016).

Green economics has gained prominence as a response to these challenges by advocating an economic system that operates within ecological boundaries while promoting human well-being and long-term prosperity. Unlike traditional environmental economics, which often treats environmental protection as a corrective add-on to economic growth, green economics positions sustainability as a core determinant of economic performance. In this context, national competitiveness is no longer viewed solely through the lens of cost efficiency and market dominance, but rather through a country's capacity to innovate sustainably, manage natural capital responsibly, and ensure social inclusiveness (Barbier, E. B. 2011).

The growing integration of environmental considerations into trade policies, investment decisions, and global supply chains has further reinforced the strategic importance of green economics. Countries that fail to adapt to low-carbon and resource-efficient development pathways risk losing competitiveness due to regulatory pressures, changing consumer preferences, and technological disruption. Conversely, nations that invest in green technologies, renewable energy, and sustainable

infrastructure may gain first-mover advantages and enhance their global economic standing (Bowen, A., & Hepburn, C., 2014).

Despite the increasing policy relevance of green economics, scholarly debate continues regarding its actual contribution to long-term national competitiveness. Critics argue that stringent environmental regulations may increase production costs and reduce industrial competitiveness, particularly in developing economies. Proponents counter that green policies stimulate innovation, productivity gains, and economic resilience over time. This review paper seeks to contribute to this debate by systematically examining the theoretical foundations, empirical findings, and policy experiences linking green economics to long-term national competitiveness (Stiglitz, J. E. et al: 2009).

II. CONCEPTUAL FOUNDATIONS OF GREEN ECONOMICS

2.1 DEFINITION AND SCOPE OF GREEN ECONOMICS

Green economics is a heterodox economic approach that emphasizes sustainability, ecological balance, and social justice as integral components of economic systems. It challenges the neoclassical assumption of infinite growth in a finite world and highlights the economic value of natural capital, ecosystem services, and intergenerational equity. Green economics advocates for an economic structure that minimizes environmental harm while maximizing societal well-being (Bowen, A., & Hepburn, C., 2014).

Key principles of green economics include resource efficiency, renewable energy use, low-carbon development, circular economy practices, and inclusive growth. Unlike conventional economic models that externalize environmental costs, green economics internalizes ecological and social costs into economic decision-making. This shift has profound implications for national competitiveness, as it redefines productivity and efficiency in sustainability-adjusted terms.

2.2 EVOLUTION FROM ENVIRONMENTAL ECONOMICS TO GREEN ECONOMICS

Environmental economics primarily focuses on correcting market failures through pricing mechanisms such as taxes, subsidies, and tradable

permits. While effective in addressing specific environmental issues, this approach often remains embedded within growth-oriented economic paradigms. Green economics extends beyond market-based corrections by advocating structural transformation of production, consumption, and governance systems (Schiederig, T. et al 2012).

The evolution toward green economics reflects growing recognition that environmental degradation poses systemic risks to economic stability. Climate change-related disasters, supply chain disruptions, and health costs associated with pollution underscore the economic consequences of unsustainable development. As a result, green economics has increasingly been linked to macroeconomic stability and long-term competitiveness.

III. UNDERSTANDING NATIONAL COMPETITIVENESS IN A GREEN CONTEXT

3.1 TRADITIONAL PERSPECTIVES ON NATIONAL COMPETITIVENESS

Traditional theories of national competitiveness emphasize factors such as labour productivity, capital accumulation, technological advancement, and trade performance. Competitive advantage has often been associated with low production costs, economies of scale, and export-oriented industrialization. While these factors remain important, they are increasingly influenced by environmental constraints and sustainability considerations (Porter, M. E., & van der Linde, C.).

Conventional competitiveness indicators tend to overlook environmental depletion and social costs, leading to a distorted assessment of long-term economic performance. For instance, high GDP growth achieved through resource exploitation may undermine future competitiveness by depleting natural capital and increasing vulnerability to environmental shocks.

3.2 REDEFINING COMPETITIVENESS FOR SUSTAINABLE DEVELOPMENT

In the context of green economics, national competitiveness encompasses a country's ability to sustain economic prosperity while preserving environmental integrity and social cohesion. This broader perspective aligns competitiveness with sustainable development goals and long-term

resilience. Green competitiveness emphasizes innovation capacity, institutional quality, environmental performance, and human capital development.

Several international indices, such as green growth indicators and sustainability-adjusted competitiveness rankings, reflect this evolving understanding. These frameworks highlight that countries with strong environmental governance and green innovation ecosystems often perform better in long-term economic competitiveness.

IV. THEORETICAL LINKAGES BETWEEN GREEN ECONOMICS AND COMPETITIVENESS

4.1 PORTER HYPOTHESIS AND GREEN INNOVATION

One of the most influential theoretical arguments linking environmental regulation and competitiveness is the Porter Hypothesis. This hypothesis suggests that well-designed environmental regulations can stimulate innovation, leading to improved efficiency and competitive advantage. Green economics aligns with this view by emphasizing innovation-driven sustainability.

Empirical studies have shown that environmental regulations can encourage firms to adopt cleaner technologies, reduce waste, and improve resource productivity. These innovations often result in cost savings and enhanced market positioning, contributing to national competitiveness over time.

4.2 RESOURCE EFFICIENCY AND PRODUCTIVITY GAINS

Green economics promotes efficient resource use through circular economy models, energy efficiency measures, and sustainable production practices. Resource efficiency reduces dependency on imported raw materials, lowers production costs, and enhances economic resilience. At the national level, these benefits translate into improved productivity and reduced exposure to resource price volatility.

Countries that invest in resource-efficient technologies are better positioned to compete in global markets where sustainability standards are increasingly stringent. This strategic advantage reinforces the link between green economics and long-term competitiveness.

V. EMPIRICAL EVIDENCE ON GREEN ECONOMICS AND COMPETITIVENESS

5.1 EVIDENCE FROM DEVELOPED ECONOMIES

Empirical studies from developed economies suggest a positive relationship between green economic policies and long-term competitiveness. Countries that have invested heavily in renewable energy, energy efficiency, and green innovation have experienced productivity gains and export growth in green industries. For example, advancements in clean technology sectors have created new employment opportunities and strengthened industrial competitiveness.

Moreover, evidence indicates that environmental regulations in advanced economies have not significantly harmed economic growth. Instead, they have contributed to technological upgrading and diversification, reinforcing the argument that green economics supports sustainable competitiveness.

5.2 EVIDENCE FROM DEVELOPING AND EMERGING ECONOMIES

In developing economies, the relationship between green economics and competitiveness is more complex. While green investments offer long-term benefits, short-term financial and institutional constraints often limit their implementation. However, emerging evidence suggests that countries integrating green strategies into industrial policy can leapfrog traditional development pathways.

Renewable energy deployment, sustainable agriculture, and green infrastructure investments have improved energy security, reduced environmental risks, and enhanced economic resilience in several emerging economies. These outcomes indicate that green economics can support competitiveness even in resource-constrained contexts.

VI. POLICY INSTRUMENTS LINKING GREEN ECONOMICS AND COMPETITIVENESS

6.1 GREEN FISCAL POLICIES

Green fiscal policies, including carbon taxes, environmental subsidies, and green public procurement, play a crucial role in aligning economic incentives with sustainability goals. Properly designed fiscal instruments encourage investment in green

technologies while generating public revenue for sustainable development initiatives.

From a competitiveness perspective, green fiscal policies can stimulate domestic industries, attract foreign investment, and enhance market credibility. However, policy consistency and social equity considerations are essential to avoid adverse distributional effects.

6.2 INSTITUTIONAL GOVERNANCE AND REGULATORY FRAMEWORKS

Strong institutions and effective governance are critical for implementing green economic policies. Transparent regulations, enforcement mechanisms, and stakeholder engagement enhance policy credibility and investor confidence. Countries with robust environmental governance frameworks tend to perform better in sustainability-adjusted competitiveness rankings.

VII. CHALLENGES AND CRITICISMS

Despite its potential benefits, green economics faces several challenges. Critics argue that green policies may increase production costs, reduce competitiveness in energy-intensive industries, and impose disproportionate burdens on developing economies. Transition costs, technological gaps, and political resistance further complicate implementation.

Additionally, measurement challenges persist in assessing the true impact of green economics on competitiveness. Conventional economic indicators often fail to capture environmental and social benefits, leading to underestimation of long-term gains.

VIII. TOWARDS AN INTEGRATED CONCEPTUAL FRAMEWORK

This review proposes an integrated framework linking green economics with long-term national competitiveness through five key dimensions: green innovation, resource efficiency, renewable energy transition, institutional governance, and social inclusiveness. These dimensions interact dynamically to enhance productivity, resilience, and global economic positioning.

By adopting a systems perspective, policymakers can design comprehensive strategies that align environmental sustainability with economic

competitiveness. Such an approach recognizes that green economics is not a constraint on growth, but a pathway to sustainable prosperity.

IX. FUTURE RESEARCH DIRECTIONS

Future research should focus on longitudinal and comparative studies to better understand the causal relationships between green economics and competitiveness. Greater emphasis is needed on developing country contexts, sector-specific analysis, and the role of digital technologies in enabling green transformation.

Moreover, improved measurement frameworks that integrate environmental and social indicators into competitiveness assessments would enhance empirical analysis and policy relevance.

X. CONCLUSION

This review paper demonstrates that green economics plays a critical role in shaping long-term national competitiveness. By integrating sustainability into economic systems, countries can enhance innovation, productivity, and resilience while addressing environmental and social challenges. Although transition costs and policy challenges remain, the long-term benefits of green economics outweigh short-term trade-offs.

The findings underscore the need for coherent policies, institutional capacity, and international cooperation to realize the full potential of green economics. Ultimately, sustainable competitiveness depends on the ability of nations to align economic performance with ecological stewardship and social well-being.

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