

Green Finance and Climate Change Mitigation

Prof Shrisha.K

Assistant Professor, Department of Humanities, HKBKCE

Abstract—Green finance has emerged as a critical mechanism for addressing the escalating challenges of climate change by channelling financial resources toward environmentally sustainable projects. This study examines the role of green financial instruments such as green bonds, carbon credits, climate funds, and sustainable banking practices in reducing greenhouse gas emissions and supporting low-carbon development pathways. Green finance enables the transition to renewable energy, energy-efficient infrastructure, sustainable agriculture, and clean transportation, thereby facilitating climate change mitigation at both national and global levels. Despite its growing relevance, the sector faces barriers including limited awareness, regulatory inconsistencies, inadequate risk assessment tools, and insufficient private sector participation. Strengthening policy frameworks, enhancing transparency, and promoting public-private partnerships are essential for accelerating green financial flows. The paper concludes that green finance is not only a tool for environmental protection but also a catalyst for sustainable economic growth, making it a vital component in achieving long-term climate resilience and meeting global commitments.

I. INTRODUCTION

Green finance has emerged as a critical instrument in addressing the dual challenges of economic growth and environmental sustainability. It encompasses financial investments and instruments designed to support sustainable development by promoting environmentally responsible projects and reducing greenhouse gas emissions. As climate change poses severe threats to ecosystems, economies, and human livelihoods, there is an urgent need to mobilize financial resources toward climate change mitigation and adaptation strategies. Green finance bridges this gap by channelling capital into initiatives such as renewable energy, energy-efficient infrastructure, sustainable agriculture, and low-carbon technologies. Globally, the financial sector plays a vital role in transforming economies toward greener pathways by

aligning investment decisions with environmental goals. Mechanisms like green bonds, carbon markets, and ESG (Environmental, Social, and Governance) investing have gained momentum in supporting this transition. Developing countries, including India, are increasingly adopting green financial frameworks to achieve their climate commitments under the Paris Agreement and Sustainable Development Goals (SDGs). However, challenges such as limited awareness, inadequate policy support, and lack of standardized green finance definitions persist. Strengthening green finance mechanisms can significantly enhance global efforts to mitigate climate change, fostering sustainable economic growth and ensuring environmental resilience for future generations.

II. REVIEW OF LITERATURE

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III. OBJECTIVES OF THE STUDY

1. To examine the concept and evolution of green finance and its role in promoting environmentally sustainable economic growth.
2. To analyse the relationship between green financial instruments (such as green bonds, green loans, and ESG investments) and climate change mitigation efforts.
3. To evaluate global and national policy frameworks that facilitate the adoption and expansion of green finance mechanisms.
4. To assess the contribution of green finance in reducing carbon emissions and supporting low-carbon technologies and renewable energy development.
5. To identify challenges and barriers in implementing green finance initiatives, particularly in developing economies like India.
6. To explore the role of financial institutions and investors in mobilizing capital for climate-resilient and sustainable projects.

IV. RESEARCH FINDINGS

- The study reveals that green finance has become a vital driver of global efforts to mitigate climate change by mobilizing capital toward environmentally sustainable projects. Over the past decade, financial markets have shown a rapid increase in green financial instruments such as green bonds, green loans, and sustainability-linked funds. According to global data, the issuance of green bonds has surpassed USD 2

trillion in 2023, demonstrating a strong investor preference for environmentally responsible investments.

- Findings indicate that countries with well-defined green finance policies and taxonomies such as the European Union, China, and India have experienced measurable progress in directing financial flows toward renewable energy, waste management, and energy-efficient infrastructure. In India, for example, the introduction of sovereign green bonds in 2023 has enhanced the government's capacity to finance climate-resilient projects aligned with the National Action Plan on Climate Change (NAPCC).
- Empirical evidence from prior studies shows that green finance significantly contributes to carbon emission reduction by supporting the transition from fossil fuels to clean energy sources. However, the magnitude of its impact varies depending on the regulatory environment, investor awareness, and institutional capacity.
- The research also highlights key challenges, including inadequate green finance frameworks in developing countries, lack of standardized definitions, greenwashing risks, and limited access to long-term financing. Despite these barriers, global initiatives such as the Paris Agreement and the UN Sustainable Development Goals (SDGs) have strengthened policy commitments and financial cooperation across nations.
- Overall, the findings affirm that green finance plays an essential role in achieving climate change mitigation, fostering sustainable economic growth, and ensuring environmental resilience. Continued policy support, innovation, and collaboration between governments, financial institutions, and investors are crucial to expand its long-term impact.
- International climate funds, such as the Green Climate Fund (GCF), Global Environment Facility (GEF), and Climate Investment Funds (CIF), have improved the flow of capital to climate-vulnerable developing countries, although access remains uneven due to administrative complexities. Banks are increasingly adopting risk assessment frameworks that incorporate climate-related

financial risks, such as transition and physical risks. This shift encourages funding for projects that reduce vulnerability to climate impacts. Public-private partnerships (PPP) have emerged as an effective mechanism for funding large-scale climate-resilient projects. Governments provide policy incentives, while private investors supply capital and innovation.

V. CONCLUSION AND RECOMMENDATIONS

The study concludes that green finance serves as a powerful mechanism for addressing climate change and promoting sustainable development. By channelling financial resources into low-carbon technologies, renewable energy, and environmentally responsible infrastructure, green finance contributes significantly to global climate mitigation goals. The growth of green bonds, ESG investments, and sustainability-linked funds demonstrates increasing awareness and commitment among governments, corporations, and investors toward environmental responsibility.

However, the research also underscores persistent challenges and disparities between developed and developing economies in adopting and scaling green financial practices. Issues such as limited institutional capacity, insufficient regulatory frameworks, lack of investor confidence, and the threat of greenwashing hinder progress. Despite these obstacles, nations that have implemented well-defined policies, incentives, and disclosure requirements such as the European Union's Green Deal and India's Green Bond Framework have shown positive outcomes in mobilizing funds for sustainable projects.

Green finance not only mitigates climate risks but also supports inclusive economic growth, innovation, and job creation in emerging green industries. Thus, it stands at the intersection of financial stability and environmental stewardship, making it essential for long-term climate resilience.

VI. RECOMMENDATIONS

1. **Policy Strengthening:** Governments should develop clear green finance taxonomies and establish strong monitoring systems to ensure transparency and prevent greenwashing.

2. **Financial Innovation:** Encourage the creation of new green instruments such as sustainability-linked loans and climate risk insurance to attract private investment.
3. **Capacity Building:** Train financial institutions, regulators, and investors to evaluate and manage environmental risks effectively.
4. **Public-Private Partnerships:** Promote collaboration between public agencies and private sectors to finance large-scale renewable and adaptation projects.
5. **Global Cooperation:** Strengthen international financing mechanisms under frameworks like the Paris Agreement to support developing nations in climate mitigation.

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