



Adoption of Green Banking Practices in the Indian Banking Sector

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Abstract: Growing environmental consciousness across industries has positioned the banking sector as a strategic actor due to its decisive influence on national economic growth and development. In response to climate change, resource depletion, and environmental degradation, banks are assuming an expanded role as institutional drivers of sustainable transformation. Green banking integrates environmental sustainability into financial services through eco-friendly policies, digitalization, green financing, and responsible investment practices. This study examines the concept of green banking and its role in promoting sustainable development in the Indian banking sector. It focuses on initiatives such as paperless banking, electronic payments, energy-efficient operations, sustainable lending, green financing, and customer awareness programs. A conceptual framework is proposed to explain the contribution of green banking to economic innovation, environmental protection, and social responsibility. The study also identifies key challenges and future prospects, highlighting the role of technology, regulatory support, and financial innovation in strengthening sustainable finance in India.

Key Words: *Green Banking, Sustainable Development, Indian Banking Sector, Green Finance, Sustainable Finance, Environmental Sustainability, Digital Banking*

Introduction

The banking sector plays an important role in the growth and development of any economy because it influences how money is saved, invested, and used. Even though banks do not create pollution directly, they support many industries and projects through loans and investments that can harm the environment. In this way, banks contribute indirectly to environmental damage and carbon emissions. Because of this, banks have a responsibility to reduce their environmental impact and support activities that protect nature and promote sustainability. Environmental sustainability means using natural resources carefully and responsibly so that they are not wasted and can be used again in the future. It focuses on protecting nature while supporting human needs and economic growth at the same time. Today, people across the world are becoming more aware that human activities such as pollution, carbon emissions, global warming, climate change, irregular weather, floods, droughts, and high greenhouse gas levels are seriously harming the planet. Although countries do not always agree on how to share responsibility for reducing environmental damage, many nations are now taking strong steps to control climate change and protect the environment. In India, steps have been taken to involve the financial sector in environmental protection. The Reserve Bank of India (RBI) has introduced rules that allow banks to accept green deposits. These deposits are meant to be used only for environment-friendly projects such as clean energy, energy-saving systems, clean transport, safe waste and water management, pollution control, climate protection, and nature conservation. The guidelines also ensure that money collected through green deposits is used properly, openly, and honestly for sustainable purposes. Green banking in India started with the State Bank of India (SBI) in 2009, when it launched the country's first wind energy project in Coimbatore. Since then, green banking has grown into an important approach in the Indian banking system. It now includes eco-friendly banking practices, responsible lending, digital services, and financial support for sustainable projects. Through these efforts, banks are gradually becoming key contributors to environmental

protection, social responsibility, and sustainable national development. Global frameworks support sustainable finance. More than 200 member nations support sustainable development initiatives aligned with such global frameworks. India is among these nations and follows sustainability-related banking guidelines issued by the Reserve Bank of India (2017). Multiple studies confirm the growing importance of green banking. Technology plays a crucial role in promoting sustainability. Despite institutional efforts, awareness and trust issues persist. There is a significant research gap in studying the impact of green banking on sustainable development in India. Jha & Bhome (2013) studied green banking practices in Indian public sector banks. Their key findings include Public sector banks have initiated green banking measures. They suggested reducing interest rates on green projects to encourage environmentally friendly investments. They argued that profitability could be improved through Waste recycling initiatives and Green financial products such as: Green mortgage loans and Green credit cards. Singhal et al. (2014) highlighted the important role of banks in protecting the environment. They emphasized that Banks should promote green products such as: ATM services and Credit cards and Electronic Fund Transfers (EFT). These services reduce paper usage and minimize physical transactions, thereby reducing carbon footprints and environmental degradation. Their study stresses that banks are not just financial intermediaries but also agents of environmental protection. Khedekar (2014) focused on the role of technology in promoting green banking. The study suggested to provide full-scale internet banking services and organize seminars to educate customers about Internet banking, cybersecurity issues and introducing the concept of "Virtual Banking" for remote branches. The idea of Virtual Banking implies reducing physical infrastructure dependency and promoting digital platforms, thereby lowering environmental impact. Sahitya & Lalwani (2014) emphasized that green banking is essential for sustainable banking practices. Their study noted that active participation of public and private sector banks and adoption of paperless banking systems such as: ATM banking, Mobile banking and Internet banking. Ragupathi and Sujatha (2015) examined how green banking evolved in Indian commercial banks. They found that a gradual increase in environmental awareness among banks and shift towards sustainability-oriented policies and also Green banking practices helped improve asset quality. Lymperopoulos et al. (2012) found that green bank marketing positively influences a bank's environmental image. When banks promote green initiatives effectively, Customers perceive them as environmentally responsible. However, No similar study has examined this relationship in the Indian context. The impact of green banking initiatives on sustainable development in India remains unexplored.

This reflective study attempts to achieve the following objectives:

RO1: To study green banking initiatives and sustainability practices in Indian banks.

RO2: To examine green financing strategies and challenges in India.

Research Methodology:

This study adopts a descriptive research approach to explore green banking initiatives, sustainability practices, and green financing strategies in Indian banks. The research primarily relies on secondary data sources to achieve the stated research objectives. Secondary data was collected through an extensive review of existing literature, including research articles, annual reports, policy documents, and publications related to green banking, sustainable finance, and environmental initiatives undertaken by banks in India. This literature review helped in understanding the conceptual background, existing green banking practices, and the broader framework of sustainability in the banking sector.

Concept of Green Banking

Green banking has emerged as an important concept in the financial sector aimed at promoting sustainable development and environmentally responsible financial practices. It provides mutual benefits to banks, industries, and the overall economy by encouraging environmentally friendly investments while improving the long-term asset quality and risk management of financial institutions. One of the major environmental concerns addressed through green banking is the reduction of carbon footprints generated by activities such as deforestation, rapid industrialization, and the burning of fossil fuels. These activities significantly contribute to global warming and climate change, resulting in rising temperatures and environmental instability. Consequently, sustainable practices based on the principles of reduce, reuse, and recycle are increasingly emphasized to minimize environmental degradation and promote responsible resource utilization. Green banking primarily refers to the adoption of environmentally responsible policies in both internal banking operations and external financial activities. Several studies have emphasized the growing importance of sustainability within banking systems. Bose et al. (2017) state that green banking integrates environmental considerations into routine banking operations and encourages financial institutions to adopt eco-friendly practices. Similarly, Hossain et al. (2020)

and Zhixia et al. (2018) describe banks that undertake such environmentally conscious initiatives as socially responsible or sustainable banks. Hermes et al. (2005) further argue that the banking sector should gradually shift from traditional banking systems toward sustainable frameworks that incorporate environmental, social, and governance (ESG) considerations into strategic decision-making processes. In the same context, Scholtens (2009) highlighted the concept of green corporate social responsibility in banking and suggested that financial institutions can promote sustainability by directing customers' savings toward environmentally sustainable investment projects.

Financial institutions contribute to sustainability by financing renewable energy projects, environmentally friendly infrastructure, and green technologies. Banga (2019) and Bhattacharya et al. (2015) emphasize that banks in emerging economies play a crucial role in mobilizing green capital and channeling financial resources toward sustainable development. In recent years, banks have introduced various green financial instruments such as green bonds, green loans, and green deposits to support environmentally sustainable projects. These financial instruments help finance initiatives related to renewable energy, water conservation, and eco-friendly transportation systems. Sahoo and Dhal (2011) and Maltais and Nykvist (2020) point out that the adoption of such instruments enables banks to diversify their investment portfolios while attracting environmentally conscious investors.

Institutional collaboration and regulatory support have also been identified as important factors in expanding green finance. Partnerships between banks, government agencies, and development institutions facilitate the financing of large-scale sustainable infrastructure projects through shared risk mechanisms and coordinated financial efforts. Dhar et al. (2020) emphasize that strong institutional collaboration is essential for scaling climate finance in developing economies. Furthermore, regulatory frameworks play a crucial role in promoting sustainable banking practices. Weber (2010) and Zadek and Flynn (2013) highlight that supportive regulatory policies help integrate sustainability into financial systems and encourage responsible lending practices among banks.

A number of studies have also examined the relationship between green finance and the financial performance of banks. Flammer (2021) and Tang and Zhang (2020) found that organizations issuing green bonds often experience improved financial performance, including higher returns on assets, reduced funding costs, and greater investor confidence. Similarly, Friede et al. (2015) observed that financial institutions actively involved in sustainable finance demonstrate stronger resilience and lower credit risks, indicating that green banking practices can enhance long-term financial stability and profitability.

Technological advancements have further strengthened the implementation of green banking initiatives. Sevela (2020) observed that the adoption of technologies such as paperless banking systems, digital databases, biometric security systems, and online passbook updates significantly reduces the consumption of paper and other physical resources. Olekar and Shailaja (2021) found that digital banking services and online transactions implemented by banks such as SBI and ICICI Bank reduce environmental impact while improving operational efficiency. Chaya and Rakshita (2023) also noted that banks have expanded their sustainability initiatives to include waste recycling systems, rainwater harvesting, solar energy utilization, and environmentally sustainable buildings.

Customer awareness is another important factor influencing the adoption of green banking services. Grimakar and Sudharshan (2018) observed that younger customers are more inclined toward adopting green banking services, whereas older customers require greater awareness and education. Similarly, Sahi and Anurag Pahuja (2017) reported that although many customers recognize green banking as an environmentally friendly approach that saves time and cost, awareness levels remain relatively low in certain regions. Bahl (2012), Rakesh et al. (2016), and Shakkeela (2016) further emphasized the importance of awareness programs and the concept of the triple bottom line—people, planet, and profit—in promoting sustainable banking practices.

Despite the numerous benefits associated with green banking, several challenges hinder its widespread implementation. Kumar and Prakash (2022) and Sharma and Deshmukh (2022) highlight issues such as the lack of standardized environmental data, limited technical expertise, and underdeveloped green financial markets. Ameli et al. (2021) and Rajput et al. (2020) also point out that policy gaps, infrastructure limitations, and institutional constraints slow down the integration of sustainable finance within the banking sector. Earlier studies by Trehan (2015) and Chaurasia (2014) similarly observed that although green banking contributes to financial

development and supports Sustainable Development Goals, its implementation in India remains limited. Overall, the existing literature indicates that while green banking offers significant potential for promoting sustainable development, stronger policies, institutional collaboration, and increased awareness are essential for its effective implementation.

Green Banking Initiatives in the Private Sector Banks

Private sector banks play an important role in supporting economic development by providing financial services and credit facilities to various sectors of the economy. They offer loans and financial assistance to industries, businesses, entrepreneurs, and service sectors, thereby promoting investment, innovation, and business expansion. Private sector banks focus on improving efficiency, adopting advanced technologies, and delivering customer-centric services to meet the evolving needs of individuals and businesses. Over the years, these banks have strengthened their presence through digital banking, innovative financial products, and efficient risk management practices. Today, private sector banks continue to grow by enhancing service quality, encouraging entrepreneurship, and contributing significantly to economic growth while maintaining competitiveness and operational excellence in the banking sector.

Axis Bank- Axis Bank has integrated environmental sustainability into its banking operations through various green banking initiatives aligned with Environmental, Social, and Governance (ESG) principles. The bank focuses on reducing its environmental footprint by minimizing energy consumption, diesel usage, and paper-based documentation through digital transformation and green technologies. During fiscal year 2025, the bank maintained a green lending portfolio of ₹22,160 crore and conducted 447 ESG-based environmental and social due diligence assessments for financing proposals. The bank has undertaken several initiatives to reduce carbon emissions and improve energy efficiency. These include the commissioning of a 2 MW solar power plant in Solapur, procurement of solar energy for its Bengaluru data centre, and implementation of a Centralised Energy Management System (CEMS) across major offices. As a result, the bank avoided significant carbon emissions and achieved annual energy savings of 3.87 million kWh. Furthermore, several offices operate entirely on renewable energy, and energy-efficient technologies such as LED lighting, motion sensors, and star-rated air conditioners have been installed. In addition to energy management, the bank promotes water conservation, waste management, and habitat restoration. Rainwater harvesting systems have been installed in major facilities, and responsible waste management practices have enabled recycling of paper, plastic, metal, and electronic waste. Through its CSR initiatives, the bank has also planted over 3.27 million trees across India, contributing to ecological restoration and biodiversity conservation. Moreover, the bank has adopted a Sustainable Financing Framework aligned with the United Nations Sustainable Development Goals (SDGs) and established governance mechanisms such as an ESG Committee and ESG Policy for Lending. These frameworks integrate environmental and social risk assessments into credit appraisal processes and guide investments toward environmentally responsible sectors. Overall, the bank's sustainability strategy demonstrates how financial institutions can support climate goals while promoting responsible economic development.

HDFC Bank -The **green banking initiatives** of HDFC Bank are guided by its Environmental, Social and Governance (ESG) policy framework, which focuses on reducing environmental impact and promoting sustainable development. The bank has adopted several measures to address climate change and environmental sustainability. It measures and discloses its greenhouse gas emissions annually and has committed to achieving **carbon neutrality in its operations by FY 2032**. The bank promotes the use of renewable and clean energy in its offices, implements energy-efficient building designs, and adopts automated energy management systems to reduce energy consumption. It also focuses on responsible waste management by ensuring proper disposal of electronic waste through authorized recyclers and by reducing paper consumption through digital banking services. In addition, the bank has phased out single-use plastic water bottles across its offices and promotes water conservation practices. Further, HDFC Bank integrates **environmental and social risk assessment** into its lending decisions to ensure that financed projects comply with environmental regulations and promote sustainable development. Through its sustainable finance framework, the bank supports green, social, and sustainability-linked financing. These initiatives demonstrate the bank's commitment to environmentally responsible banking and contribute to the promotion of sustainable economic growth.

ICICI Bank -ICICI Bank has undertaken several initiatives to promote green banking and sustainable development as part of its Environmental, Social, and Governance (ESG) commitments. The bank has significantly expanded its renewable energy usage, reaching **7.57 crore kWh in FY 2024**, which reflects its efforts to reduce carbon emissions and adopt clean energy sources. It has also implemented **solar power projects in rural schools**, installing systems across **3,180 schools with a total capacity of 9,970 kW since FY 2022**, thereby supporting sustainable energy and rural development. In addition, the bank has partnered with state forest departments to promote **forest conservation and biodiversity protection**, covering **53 forests and wildlife sanctuaries in 19 states** and restoring **4,115 hectares of grassland**. ICICI Bank has also focused on **water conservation initiatives**, creating a water harvesting capacity of **2,580 crore liters**, benefiting thousands of schools and restoring numerous water bodies. To promote sustainable agriculture, the bank established **over 505 crop processing units in 21 states**, helping farmers reduce waste and improve productivity. Furthermore, the bank has strengthened its **sustainable financing portfolio to ₹68,528 crore**, supporting environmentally responsible projects and green investments. Through these initiatives, ICICI Bank aims to achieve **carbon neutrality in Scope 1 and Scope 2 emissions by FY 2032**, demonstrating its strong commitment to environmentally responsible banking practices.

Challenges of Green Financing

1. Expensive Financing for Green Projects

Green initiatives often require substantial initial investments, making them financially challenging. High interest rates, shorter loan maturity periods, and the lack of non-recourse financing options increase the cost of debt capital for such projects. These financial constraints discourage businesses and institutions from undertaking environmentally sustainable investments.

2. Inadequate Mechanisms for Evaluating Sustainable Projects

The lack of standardized and efficient frameworks for assessing the viability of sustainable and environmentally friendly projects poses another challenge. This issue is particularly evident during the early stages of innovative projects, where uncertainty regarding outcomes makes it difficult for financial institutions to allocate funds confidently.

3. Financial and Operational Risks in Green Investments

Green finance projects are often exposed to multiple risks, including technological uncertainties, fluctuations in exchange rates, and uncertainties related to project off-takers. These risks can reduce investor confidence and limit the availability of funds for environmentally sustainable projects.

4. Low Awareness Among Investors

A major challenge in promoting green finance is the limited understanding among investors regarding innovative financial instruments such as green bonds and sustainable investment funds. Insufficient knowledge about their potential benefits and returns restricts investor participation in environmentally focused financial markets.

5. Institutional and Regulatory Barriers

The implementation of green financial instruments is frequently hindered by existing regulatory structures and market practices. Inadequate monitoring mechanisms and the absence of strong financial incentives further limit the expansion of green financing. Developing supportive policies and regulatory frameworks is essential for encouraging sustainable financial activities.

6. Limited Development of the Green Bond Market

The green bond market in India is still at an early stage of development and faces difficulty in attracting a broad base of investors. Many investors prefer securities that carry high credit ratings or involve minimal risk, which reduces their willingness to invest in green bonds. Strengthening regulatory frameworks and improving transparency can help increase investor confidence and encourage greater participation in this market.

Findings

The study highlights that private sector banks in India are actively integrating environmental sustainability into their banking operations through various green banking initiatives. Leading banks such as Axis Bank, HDFC Bank, and ICICI Bank have adopted policies aligned with Environmental, Social, and Governance (ESG) principles to reduce their environmental footprint and promote sustainable development. The findings reveal that these banks are focusing on reducing carbon emissions, promoting renewable energy usage, and improving energy efficiency through digital banking services and energy-efficient infrastructure.

For instance, initiatives such as solar power installations, renewable energy procurement, centralized energy management systems, and paperless banking practices demonstrate the banks' commitment to environmental sustainability. In addition, these banks are strengthening their sustainable finance portfolios by funding environmentally responsible projects, promoting sustainable agriculture, supporting biodiversity conservation, and implementing water conservation programs. The analysis also indicates that private sector banks are incorporating environmental and social risk assessments into their lending decisions through sustainable finance frameworks. Furthermore, corporate social responsibility initiatives such as tree plantation drives, installation of solar power systems in rural schools, and restoration of natural resources highlight their broader commitment to ecological protection and community development.

Suggestions

1. Banks should increase public awareness regarding green banking initiatives through their official websites and digital platforms to encourage customers to adopt environmentally responsible banking practices.
2. Financial institutions should establish dedicated green banking departments to ensure proper planning, monitoring, and effective implementation of sustainability initiatives.
3. Banks may introduce subscription-based or incentive programs for customers that promote eco-friendly and biodegradable products and services.
4. Greater financial support should be provided for environmentally sustainable projects, along with active participation in corporate social responsibility programs that focus on environmental conservation.
5. Regulatory frameworks and internal management policies should be modified to incorporate sustainability considerations within existing banking operations and decision-making processes.
6. Banks should create digital platforms or information portals to educate customers about reducing carbon footprints by adopting environmentally friendly practices such as using public or mass transportation.
7. Internal communication channels such as organizational intranet systems and official websites should be utilized to disseminate information about sustainability initiatives among employees and stakeholders.

Conclusion

Green banking has emerged as an important strategy for promoting sustainable development within the banking sector. Private sector banks in India are increasingly integrating environmental sustainability into their operations by adopting renewable energy solutions, promoting digital banking services, implementing energy-efficient technologies, and supporting environmentally responsible investments. The initiatives undertaken by banks such as Axis Bank, HDFC Bank, and ICICI Bank demonstrate a growing commitment toward reducing environmental impact while contributing to economic growth. Despite these positive developments, greater efforts are required to enhance public awareness, strengthen regulatory frameworks, and expand green financing opportunities. By adopting comprehensive sustainability strategies and encouraging responsible banking practices, private sector banks can play a significant role in achieving long-term environmental sustainability and supporting the transition toward a greener and more resilient economy.

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