



Research Paper

# "Green Banking: Transformative Impacts on Banking Operations and Customer Engagement - A Comprehensive Literature Review"

Nimitha K <sup>1\*</sup> & Carmelita Goveas <sup>2</sup>

<sup>1</sup> Research Scholar, Institute of Management and Commerce, Srinivas University, Mangaluru-575001, India. & Assistant Professor of Commerce, St. Agnes College, Mangaluru, Karnataka, India.

<sup>2</sup> Research Professor, Institute of Management and Commerce, Srinivas University, Mangaluru, India.

## ABSTRACT

**Purpose:** As environmental concerns continue to grow internationally, the financial industry is undergoing a paradigm shift toward sustainability that gave rise to the concept of Green Banking. This literature review aims to comprehensively explore the ways in which Green Banking has revolutionized banking practices and customer engagement. Green banking is the process of making financial decisions that take the environment into account in an effort to promote broader sustainability goals. The literature review looks at the broad impacts of green banking on customer involvement. The study looks at how customers that value the environment respond to sustainable banking practices, including how their decisions, loyalty, and general well-being change. The study also examines the communication strategies banks employ to demonstrate their commitment to environmental stewardship and the ways in which these strategies influence the views and behavior of their customer base. The evaluation also covers the challenges and opportunities that financial institutions face when implementing green banking, including risk management, legal issues, and the potential for financial innovation.

**Design/ Methodology:** This work examines published research papers, secondary data, and an analysis of a case study. The many details on green banking activities and the comparison of private and public banks are derived from publicly available information, including bank annual reports, green financial institution practices, and state Private banks and owned commercial banks are taken into account for the research.

**Findings:** This review-based study addresses the revolutionary implications of green banking on banking operations and customer engagement, with the goal of helping banks navigate and capitalize on these transformations. Effectively managing and capitalizing on these advances is essential for meeting customer expectations, maintaining competitiveness in the constantly evolving financial industry, and increasing operational efficiency. An analysis is conducted on the green initiatives offered by both public and commercial banks, including credit card loans, green debit, mobile banking, and online banking. The gap in research is identified.

**Originality:** This review-based research paper identifies the current status, research gap and analyses the research agendas related to transformative impacts of green banking on banking operations and customer engagement.

**Paper Type:** Review-based research analysis

**Keywords:** Green Banking, Customers, Sustainability

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## I. INTRODUCTION:

People still do things that harm the environment in an effort to improve the economy and maximize riches. The world is now dealing with the effects of climate change, including heat waves and floods (Zheng, G.W . et al (2021)[1]). Concern for environment-related issues is increasing globally and, recently, among enterprises and institutions, leading to the development of various means of evaluating it. Consequently,

countries have been assessed and classed according to their environmental performance ranking, where leading countries are awarded the 'Champion of the Earth Award' based on their adopted environmental measures (Sarma, P., & Roy, A. (2020)[2]). Furthermore, financial organizations receive the "Golden Peacock Climate Management Award," and the world's economies are ranked using the "Global Green Economy Index" in addition to numerous other assessment indices. One of the key issues confronting both industrialized and developing nations worldwide is climate change (Ngwenya, N., & Simatele, M.D. (2020)[3]). Bangladesh is regarded as one of the top rising countries in the world, with enormous potential for investment and economic expansion that would allow it to dominate the 21st century (Nawaz, M.A., et al (2020)[4]).

Nonetheless, the nation must contend with the hazards posed by climate change and the ensuing environmental consequences. For example, Bangladesh is regarded as one of the countries most vulnerable to the effects of climate change, such as the rise in sea level, which has impacted the natural ecology and increased the population's economic suffering (Aker, N., et al (2018)[5]). It has therefore implemented a number of initiatives to lessen the dangers and unfavorable consequences of climate change on the environment (Hossain, M. (2018) [6]). Among the most important tactics used to stop environmental deterioration are the promotion of sustainable growth and the implementation of green banking and financing that adheres to international standards [1].

Green banking is the mainstay of the comprehensive idea of "green finance." [2] Green banking (GB) is the term for banking practices that prioritize ecological, social, and economic aspects in order to save the environment and natural resources (Chowdhury, T.U.,(2013)[7]) and (Rai, R., et al (2019)[8]). To tackle climate change and save the environment, green banking necessitates investments in environmentally friendly goods and services. According to Haque and Murtaz, GB is seen as a crucial component of sustained economic growth in a nation like Bangladesh [9].

Thus, it is also possible to argue that GB is crucial to international efforts to address climate change issues and realize sustainable development goals (SDGs) (Chen, J., et al (2022)[10]).

The word "GB" refers to a broad set of rules and guidelines that make banks sustainable in terms of the economy, environment, and society (Srivastava, A. (2016) [11]).

Enhancing the efficacy and efficiency of banking procedures, as well as the use of physical infrastructure and IT, with negligible or no environmental impact, is the goal. Furthermore, because emerging countries are more vulnerable to climate change and global warming than developed economies, green and environmental measures are especially crucial to them. Bangladesh is regarded as among the first nations to declare the adoption of GB-related practices, having done so in 2011 in order to attain sustainable economic development (Bose, S., et al (2018)[12]).

## **II. OBJECTIVES OF THIS STUDY:**

- (1) Analyze the Green Banking Conceptual Framework
- (2) Examine Modifications to Banking Institutions' Operations
- (3) Examine the Dynamics of Customer Engagement
- (4) Analyze the Communication Techniques Used by Banks
- (5) Examine the Opportunities and Challenges in Green Banking
- (6) Enhance the Scholarly and Useful Knowledge of Green Banking

## **III. RESEARCH METHODOLOGY:**

This work examines published research papers, secondary data, and an analysis of a case study. The many details on green banking activities and the comparison of private and public banks are derived from publicly available information, including bank annual reports, green financial institution practices, and state Private banks and owned commercial banks are taken into account for the research.

### **ESSENTIAL ELEMENTS OF GREEN BANKING:**

The following are some crucial components of green banking operations: (Lalon, R. M. (2015)[13]).

- (1) Banks can contribute to the environment by using internet banking and automation.
- (2) Green finance is centered on mitigating the adverse effects of society on social safety and security.
- (3) When it comes to funding, loans and investments that take environmental risk considerations into account always come first.
- (4) It constantly considers social as well as environmentally friendly and sustainable industrial growth. It fosters a friendly environment both inside and outside the bank.
- (5) It views its clients as part of its family and, as such, directs and oversees pollution reduction programs, applying environmental due diligence (EDD) checklists to use scientific methodologies in a true sense.
- (6) It lowers expenses and energy use, saving money and boosting a nation's GDP.

### **GREEN BANKING PRACTICES BY INDIAN BANKS:**

The concept was initially put into practice in 1980 by "Triodos Bank," a Dutch bank. (Yadav, R.; Pathak, G.S (2013)[14]). "Green banking" describes a financial operation that is run to reduce carbon emissions both internally and externally. The purpose of this study is to learn more about the application of green banking technologies in the banking sector and to look at green business initiatives (Prabhu, G. N., & Aithal, P. S. (2021) [15]). "Green banking" describes a banking business that takes steps to reduce its carbon footprint, both internally and externally. Finding out more about how green banking technologies are being used by the banking sector and looking into green business efforts are the goals of this study (Jha, N., & Bhome, S. (2013)[16]).

Green banks, or environmentally conscious banks, influence other businesses' socially conscious actions in addition to raising their own standards. Indian banks have created a number of green banking initiatives, most notably State Bank of India, the country's largest commercial bank. The bank has recently started offering its clients a variety of paperless banking options. By using these strategies, customers can make significant environmental contributions (Deka, G. (2015) [17]).

The main applications of green banking are as follows, according to the RBI-established Institute for Development and Research in Banking Technology: (Ahuja, N.(2015)[18]).

- (i) Green process refers to the idea that every component and activity should be friendly to the environment. Paperless transactions, keeping in touch with customers via internet channels, and providing financial goods with the least amount of environmental impact are a few examples.
- (ii) Green goods and services include paperless statements and electronic banking, among others.
- (iii) Green strategies include establishing a green strategy, making it known to the public, and educating the important stakeholders about environmental values.

#### **(A) Green Finance Products for Banking (Chaurasia, A. K. (2014) [19])**

Among the financial instruments offered by green banks are:

- (i) Green Deposits:** When clients want to perform their banking business online, banks provide greater rates on commercial deposits, money market accounts, checking accounts, and savings accounts.
- (ii) Green Loans and Mortgages:** Banks provide energy-efficient homes with green mortgages that have better terms or rates. Certain green mortgages enable homebuyers to contribute up to 15% more of their home's price toward loans for improvements such as water heaters, solar panels, geothermal heating, and energy-efficient windows. Long-term financial savings can be achieved by offsetting the higher monthly mortgage payments with the savings from lower energy expenses.
- (iii) Green credit cards:** With a green credit card, users can accrue points or prizes that can be exchanged for donations to charitable organizations that support the environment. These cards are a great way to encourage customers to use their green cards for pricey items.
- (iv) Green Reward Checking Accounts:** Customers that go green can receive a bonus rate on reward checking accounts, a type of bank product. If a customer meets monthly requirements—such as using a debit or check card, receiving electronic statements, or paying bills online—they may be eligible for higher checking account rates. Higher rates and environmentally sustainable living go hand in hand with this financial offer.
- (v) Mobile Banking:** This type of banking can be complex. On the one hand, being able to use a mobile device to pay bills, transfer money, and check balances is fantastic. Conversely, it conserves the clients' time and energy. It also aids in lowering the bank's energy and paper consumption. This paperless option has been implemented by the majority of Indian banks.

#### **(B) Reducing Carbon Footprint:**

The amount of environmental damage caused by human activity is measured by the carbon footprint. It has to do with how many Green House Gases (GHG) we release into the atmosphere on a daily basis when we use fossil fuels to generate energy, heat, move, and other things. Banks can minimize their carbon footprints by implementing the following measures:

- (i) Paperless Banking:** With bank branches being automated, there is a lot of room to do less paper-based or paperless banking. Large amounts of paper are typically used by public sector banks for office correspondence, audit reporting, documenting public transactions, etc. These banks have the option to convert to electronic reporting and correspondence. Financial institutions ought to motivate their clientele to transition to digital transactions and promote the use of electronic statements.
- (ii) Energy Consciousness:** Banks can significantly reduce their energy use by utilizing compact fluorescent lighting (CFL), implementing efficient office time management and automation systems, and cultivating an energy-conscious mindset. For efficient energy management, banks are able to do energy audits at each of their offices. Additionally, they have the option to manage their offices and ATMs using renewable energy sources like solar, wind, etc.
- (iii) Making Use of the Mass Transit System:** Banks can become more fuel-efficient organizations by offering shared transportation for officials stationed at a single location.

**(iv) Green Building:** The banking sector in India uses over a lakh locations for its offices and homes around the nation. These banks ought to construct green structures for their staff housing and offices.

**(v) Go Online:** In India's young and corporate population, online banking is a relatively new idea. Further energy and resource saving is aided by online banking. Online bill payment, remote deposit, online financial transfers, and online statements are all included in online banking. Less paper, less energy, and less natural resource consumption from banking operations all result in savings. Consumers can save money by avoiding late penalties and saving time by paying online from home instead of waiting in line.

**(vi) Preserve Paper:** Banks ought to buy products made from recycled paper that include the most post-consumer waste feasible. Monthly statements, brochures, ATM receipts, yearly reports, newsletters, copy paper, envelopes, and other materials fall under this category. Vegetable-based inks are preferable than less eco-friendly oil-based inks whenever they are available.

**(vii) Use of Solar and Wind Energy:** One of the noble reasons to go green is to use solar and wind energy. As part of its green banking initiative, State Bank of India (SBI) has installed 10 windmills with a combined capacity of 15 MW in the states of Tamil Nadu, Maharashtra, and Gujarat, making it the first bank in the nation to venture into the generation of green power.

## **6. ENVIRONMENTAL MANAGEMENT BY BANKING INSTITUTIONS** (Sudhalakshmi, K., & Chinnadorai, K. (2014) [20]).

(i) Nowadays, the majority of the commercial lending process across the globe use a suite of instruments to examine projects and integrate environmental considerations into their daily operations. Financial institutions ought to support initiatives that address the following issues when providing funding:

(a) the utilization of renewable natural resources and sustainable development (b) the preservation of human health, biodiversity, workplace safety, and effective energy generation, delivery, and usage (c) an outside expert should create the environment management strategy; (d) pollution prevention and waste reduction; pollution controls (liquid effluents and air emissions); and solid and chemical waste management. The aforementioned factors should be considered while funding any projects.

(ii) Examining the project's scope, composition, and extent of environmental impact. The project should be evaluated on the basis of potential negative and positive environmental effects and then contrasted with the "without project situation". Before any project is financed, an Environmental Impact Assessment (EIA) should be conducted, recommending the necessary steps to prevent, minimize, and mitigate any detrimental effects on the environment.

(iii) While investing or funding the projects, the financial institutions should assess the sensitive issues like vulnerable groups; involuntary displacement etc and projects should be evaluated in terms of environmentally important areas including wetlands, forests, grasslands and other natural habitats.

(iv) Financial institutions have to assess the real estate's worth as well as any possible environmental liabilities. Thus, for the duration of the loan, the banks ought to have the authority to view the property or order an environmental audit.

(v) During the project's construction and operation, banks must also keep an eye out for the best environmental risk management program (Rutherford, 1994). Production, resources, training, support, environmental liabilities, audit programs, and so forth should all undergo physical inspections.

(vi) Loan management, credit assessment, credit approval, and loan structuring are all included in the subsequent evaluation phase. In addition, banks receive quarterly environmental compliance certificates from the government and an independent third party, as well as annual audits.

(vii) Further the banks can introduce green bank loans and products like- (a) investing in environmental projects (recycling, farming, technology, waste, etc) for example reduced –rate of interest on loans to homeowners who install a solar energy system. (b) Providing option for customers to invest in environmentally friendly banking products. (c) Investing in resources that combine ecological concerns and social concerns.

There have been indications over the past ten years that financial institutions are taking business borrowers' environmental effect into account when making investment decisions (Coulson, A. B., & Monks, V. (1999)[21]). Because banks act as middlemen in economies, they have the ability to play a significant role in promoting sustainable development. Banks play a crucial function in an economy by acting as middlemen between those with excess and insufficient capital (Jeucken, M., & Bouma, J. J. (2017)[22]). An additional significant contribution to sustainable development is made by the financial industry. One of the biggest trends in the industry right now is sustainability. Investors' focus on sustainability and environmental impact issues, corporate management's emphasis on corporate social responsibility (CSR), or investors' desire for sustainable responsible investing (SRI) could all be examples of it (Nizam, E., et al (2019)[23]).

**7. CUSTOMERS' AWARENESS REGARDING GREEN BANKING:**

In an increasingly competitive market, green banking is a must for all parties involved, and banks stand to gain from highlighting these benefits to corporate clients. The following list includes the various strategies used by banks to raise awareness among its personnel and customers:

- (1) The banking clientele lacks sufficient understanding about green banking. It is the bank's duty to increase customer awareness of the benefits of green banking. (Tara, K., Singh, S., & Kumar, R. (2015) [24]).
- (2) It is necessary to create and put into practice strategies to increase user adoption of digital and mobile banking. (Raj, D. G. P., & Rajan, D. A. P. (2017) [25]).
- (3) Banks ought to create a training curriculum to instruct and mentor customers on how to transact in the digital sphere. (Rai, R., Kharel, S., Devkota, N., & Paudel, U. R. (2019) [26]).
- (4) Input from customers is crucial for future development. This is where banks ought to focus their attention. (Ganesan, R., & Bhuvaneshwari, A. (2016) [27]).
- (5) Lastly, but just as importantly, green banking needs to be taught in high school and college curricula or as a project. (Bonin, John P., Iftexhar Hasan and Paul Wachtel (2005) [28]).
- (6) A banker may inform clients about green banking programs by, for example, rewarding clients who utilize green banking. (Datta, S. K., & Kundu, S. (2011) [29]).
- (7) Staff and customer seminars are being held (Saha, A., & Ravisankar, T. S. (2000) [30]).

**8. THE GREEN BANKING SERVICE (GBS) PRACTICES OF SOME CHOSEN PUBLIC AND PRIVATE BANKS IN INDIA :**

State Bank of India	<ol style="list-style-type: none"> <li>1. The top installer of solar ATMs is SBI. The bank has installed windmills in three states as part of its own renewable energy program.</li> <li>2. Paperless banking is being promoted and adopted nationwide.</li> <li>3. Offers project loans with low interest rates to encourage the cutting of greenhouse gas emissions. using effective manufacturing techniques (Krishnamoorthy, B., &amp; Shivkumar, A. (2020) [31]).</li> </ol>
Punjab National Bank	<ol style="list-style-type: none"> <li>1. A program to honor the circles' top CSR efforts is also in place to promote creative thinking.</li> <li>2. PNB is working hard to encourage ecologically friendly new development and integrate rainwater collection into existing buildings.</li> <li>3. In addition, promoting solar and wind energy utilization in rural areas. (Kumar, N., &amp; Kumar, N. (2016) [32])</li> </ol>
Bank of Baroda	<ol style="list-style-type: none"> <li>1. They had funded a private enterprise as well as several other green banking initiatives.</li> <li>2. Because they help with the collection of carbon credits, BOB supports environmentally friendly projects like windmills, biomass, and solar electricity (Kumar, N., &amp; Gangal, V. K. (2011) [33]).</li> </ol>
HDFC	<ol style="list-style-type: none"> <li>1. The bank has made steps to conserve energy, such as converting to CFL lighting, shutting off all lights at all branches after 11 p.m., and constructing a green data center with state-of-the-art technology.</li> <li>2. By building 20 solar ATMs, including one in Bihar, the corporation is experimenting with alternative energy (Parameswar, N., Dhir, S., &amp; Dhir, S. (2017) [34]).</li> </ol>
Axis Bank Ltd	<ol style="list-style-type: none"> <li>1. In an effort to reduce the amount of paper they consume, they also encourage their clients to use e statements and other digital communications (Ch, S. (2014) [35]).</li> <li>2. Email is used to send annual reports.</li> </ol>
ICICI Bank	<ol style="list-style-type: none"> <li>1. It's a platform that lets users bank via IVR, mobile, and Internet banking whenever and whenever they want. Because they no longer need to visit their branches or rely on paper statements, customers' carbon footprints are smaller.</li> <li>2. Vehicle Finance: For car models that use alternative energy sources, the bank is waiving 50% of the processing fee (Bansal, P., &amp; Roth, K. (2000) [36]).</li> </ol>

**9. CORPORATE SOCIAL RESPONSIBILITIES OF BANK :**

A company's commitment to long-term development is referred to as corporate social responsibility (CSR), and it involves complete involvement in areas like human resources, client, provider, and other stakeholder engagement, governance practices, the ecosystem, and communal and societal contributions (Székely, F., & Knirsch, M. (2005) [37]).

To ensure long-term growth, green banking needs to be more widely understood, and companies can adopt it as a CSR policy. Additionally, the concept of "green banking" lends money to energy-efficient projects, renewable energy projects, and companies seeking to reduce their environmental impact in daily operations (Budhwar, P. S., & Boyne, G. (2004) [28]). Despite the fact that the banking industry is not frequently regarded as a polluting one (Uddin, M. N. (2016) [38]).

Because of the increased energy use for things like lighting, air conditioning, and paper use, it has a big impact on the environment (Khan, T., & Mohamed, A. B. R. N. (2017) [39]). Therefore, ensuring the economy's long-term viability requires integrating CSR concepts into business operations. It is possible to define banks as corporate citizens who, like any other business, sector, or person, have social obligations. The phrase "green banking" highlights the importance of the environment (Ullah, M. S. (2013).[40]).

However, consumers' attitudes toward corporate social responsibility range greatly. Additionally, consumers might be more sensitive to careless conduct than to socially conscious business practices (Pomeroy, A., & Dolnicar, S. (2009). [41]).

Customers must be specific about the company's efforts towards social responsibility while tracking the reason (Batra, R., & Bahri, A. (2018) [42]). An evaluation of public and private sector banks' corporate social responsibility (CSR). This kind of activity might foster a favorable perception of the CSR practices of the company.

When CSR fosters a favorable environment with its ideal standards and rules, the relationship between the business and its clients may prosper (Dhingra, D., & Mittal, R. (2014) [43]). When integrated into the banking industry, the CSR principles have long-term effects on business from a larger viewpoint (Rocca, E., & Yashar, Y. (2018) [44]).

The quantitative analysis, which is consistent with the Porter model, shows that green CSR and innovation performance have a positive association (Romani, et al., (2016) [45]).

Corporate Social Responsibility (CSR) has gained widespread recognition as many worldwide organizations, governmental authorities, and other stakeholders recognize the significance of the issue and develop guidelines that corporations must follow ( Shukla, A (2017) [46]).

**10. RELATED WORK BASED ON LITERATURE REVIEW :**

These days, banks are becoming more and more important to environmental sustainability initiatives. Green banking practices are making people more conscious of global warming, and every businessperson is improving environmental sustainability to make the world a better place to live. (Ragupathi, M., et al (2015) [47]).

Long-term effects on the environment could have an impact on asset values and bank rate of return. Consequently, banks ought to go green and adopt a proactive stance by incorporating ecosystem considerations into their lending policies and compelling businesses to make investments in mandatory environmental preservation, suitable technologies, and management strategies. (Gürlek, M., et al., (2017) [48]).

The research revealed that green banking is a multi-stockholder enterprise and made it clear that it emerged from the RIO+20 summits, in which a number of countries expressed their support for environmental preservation. Based on component analysis, they determined the six variables—economic, policy, demand, pressure, ecological, and labor laws—that have an impact on green banking. (Polychronidou, et al., (2014) [49]). Since protecting natural resources has been one of a green bank's core principles, when a loan is approved, the interest rate is lower than it would be with a typical bank. Related Work on Green Banking Practices:

S. No	Field of Study	Literature Review	References
1	The Commercial Banks of India's Green Banking Initiatives	Banks need to have a long-term and short-term strategic plan in place before they can engage in green operations. The government ought to establish comprehensive guidelines for green banking to safeguard the environment and preserve biodiversity.	Kandavel, D. (2013) [50]
2	Sustainability of the environment	India's governmental and private sector banks have embraced green banking techniques to promote environmental sustainability.	Yadav, R., & Pathak, G. (2013)[51].
3	Diversity management's effects	The possibility of reducing carbon footprint is one of the main advantages of green building. Banks can greatly lower greenhouse gas emissions by supporting energy-efficient construction and operations as well as funding renewable energy initiatives.	Nguyen et al., (2021)[52].
4	Bangladesh's Green Banking Practices	Bangladeshi banks have a significant part to play in supporting government initiatives aimed at achieving a significant decrease in carbon emissions. In Bangladesh, banks and non-banking financial institutions (NBFIs) have been impacted by the green banking trend.	Hoque, N., et al (2019)[53].
5	India's green banking	To help farmers earn a better living, the bank has established numerous Farmers' Training Facilities (FTCs), Rural Employment Vocational Schools, Financial Literacy Centers, and Credit Counseling Services. (FLCCs).	Sahoo, P et al., (2007) [54].
6	Eco-friendly banking practices	Various steps are being taken to reduce their carbon footprints in the areas of energy efficiency, waste management, and paper usage, according to HDFC	Herath et al., (2019) [55].

		Bank. (2013)	
7	Eco-friendly banking methods	In an effort to cut down on paper usage, the bank invites customers to enroll in e-statements and has partnered with "Grow-Trees.com" to plant a seedling for each client e-statement. During the 2012–13 fiscal year	Nath, V et al., (2014) [56].
8	Profitability	Discovered that GB has a favorable impact on environmental performance, especially when it comes to waste management. These results show how important GB may be in lowering carbon emissions and advancing sustainable development.	Julia & Kassim (2016)[57].
9	Sustainability of the environment through green banking	As promised, a rainwater collection tank has been installed, and vendors certified by the emission Reduction Board are utilized to dispose of wasted oil from a portable generator. To assess the social and environmental risk of its borrowers, the company developed the SEMP (Social and Natural Resources Management System Plan), which was based on an IFC ecological model and compliance standards.	Yadav, R., & Pathak, G. (2013). [58].
10	Green Banking	Companies are increasingly focused on creating and implementing policies that will help them tackle environmental issues and seize new possibilities. requirements for compliance and regulations.	Menezes, A. (2016) [59].
11	A long-term, environmentally friendly banking strategy.	Banks must go green and actively participate in integrating ecological factors into their lending policies, compelling businesses to make investments in legally required environmental protection, suitable technologies, and control systems. They must make people more conscious of the intrinsic green value proposition.	Biswas, N. (2011) [60]
12	Long-Term Green Banking	In addition to being better for the environment, greener banking processes will boost lively efficiencies, lower the risk of fraud and manual errors, and save money on operating expenses for banks. Banks currently provide many of the services that businesses require to benefit from these advantages.	Kapoor, N et al (2016) [61]
13	The new strategic	The bank promotes environmental conservation and a reduction in greenhouse gas emissions among its staff. Their recommendation of e-transactions to their corporate clientele is causing a decline in the use of paper.	Bahl, S. (2012) [62]
14	Concerns for the environment and eco-friendly items	Organizations and customers alike acknowledge the importance of the environment to human survival. In wealthier nations, the green movement has acquired momentum and is growing quickly, but over time, acceptance is growing. among customers in the Indian subcontinent toward turning green	Chen, T. B., et al (2010) [63].
15	Green banking: Going green.	In turn, positive customer behavior patterns are associated with consumer support for additional eco-friendly products. The results could help professionals and experts track and recognize company-related difficulties better.	Moorthi, D. et. al. (2014) [64]
16	Role of commercial banks	Relationships between expectancy of performance, effort, social competition, and ecological concerns are explained here. Central bank regulations and bankers' perception is examined here.	Rifat, A., et al. (2016).[65]

17	Customers' Perception and Willingness	How the concept of green banking can be used and the perception of customers towards green banking are explained here.	Dhamija, A., et al. (2018). [66]
18	Mediating Effect	The environmental performance of banks and green banking initiatives adopted by the banks has been identified. The mediating effect of green financing is also examined here.	Zhang, X., et al. (2022). [67]
19	Performing sustainably in an underdeveloped country	Green finance is a means for a developing country to demonstrate environmentally conscious policies.	Afridi., et al. (2023). [68]
20	Environmental Resource Management	Endeavors to reevaluate the essential banking network security tools, strengthened by authorized green investments, aimed at environmental management in Bangladesh	Miah., et al. (2023). [69]

In general, GB has a favorable effect on banking profitability and sustainability. Green banks have the potential to improve their financial line over time and contribute to the promotion of a more sustainable future by making environmentally friendly operations a priority. In the coming years, GB is probably going to play a bigger role in the banking industry as sustainability gains more and more significance.

**10.1 Related work on Green Banking Practices in Indian Banks:**

According to a different survey, the banking sector is becoming more and more cognizant of the need to protect the environment. This process involves banks that are both public and private. Paperless banking techniques including ATMs, smart phones, and online banking are all viable solutions. Using e-banking not only saves time and money but also enhances the reputation of green banking. Helps sustain long-term economic growth (Rajput, N., et al., (2019) [70]).

Even though the banking industry has never been thought to be environmentally harmful, the current scope of actions has led to a significant increase in the carbon emissions of banks because of a number of factors, including their extensive energy use (for lighting, air conditioning, IT, and other electronic and electrical equipment), high paper waste, and lack of green buildings. Consequently, banks are urged to implement new technology, procedures, and goods. (Bhardwaj, et al (2013) [71]).

S. No	Focus	Literature Review	References
1	A survey of the literature.	India's green banking Paperless banking is being promoted and used all throughout the nation. Offers project financing with low interest rates to encourage the cutting of greenhouse gas emissions. Implementing productive manufacturing techniques.	Ahuja, N. (2015) [72]
2	An Examination of a Few Public Sector Banks in India's Private and Public Sector Green Banking Initiatives	There are many reasons to go green, but the following are the most significant ones: growing energy costs and consumption, growing consumer demand for eco-friendly products and services, growing public expectations of businesses regarding their environmental responsibilities, and the introduction of more stringent environmental regulations.	Sreesha Ch, (2014) [73].
3	Actions Made by Certain Banks	A CSR committee is in charge of overseeing employee involvement in CSR. Employees of the bank participate in a range of corporate social responsibility initiatives, such as the IndusInd Swachh Vidyalaya for rural development.	Prabhu, G.N (2021) [74].
4	Green Banking Practices: An Examination of Environmental Strategies Used by Banks	Green banking aims to reduce the carbon footprint of regular financial operations and promote eco-friendly practices.	Deka, G. (2015) [75]
5	a dedication to global projects	The Bank's CSR initiatives are directed through a separate arm called PNB Prerna, where female workers and spouses of the elder officers find organizations in need.	Masukujjaman, M., et al (2013) [76]
6	Social responsibility	The majority of banks don't reveal how much money they spend on CSR and instead participate in it on an as-needed basis that is unconnected to their business operations. Financial organizations need to do more voluntarily on their part to guarantee the social and economic viability of projects they fund.	Dhingra, D., & Mittal, R. (2014) [77].
7	An Empirical Analysis of Nationalized Indian Banks	Ensuring long-term viability and fostering social responsibility are two crucial roles that financial	Bag, S., Ray, N., & Manna, A. (2020) [78].



		organizations can play.	
8	The strategic importance of mandatory green banking	Contributing to the Carbon Disclosure Project, SBI uses its nationwide network of branches to carry out a range of environmentally and socially beneficial projects. For the purpose of building solar plants in India, TSolar Global SA has reached an agreement to receive long-term loans from Export Import Bank of India (EXIM), SBI, and Aston Field Renewable Resources, situated in Spain, for a maximum of 14 years.	Gupta, J. (2015) [79]
9	Social Responsibility of Companies	Although GB has a lot of potential advantages, there are drawbacks. The lack of awareness and comprehension of GB practices among bankers and clients is one of the primary obstacles. Customers might not be aware of the advantages of GB and the availability of sustainable financial goods and services, and many banks lack the knowledge and resources necessary to create and implement sustainable practices and regulations.	Usman & Amran, (2015)[80].
10	Recent developments	Furthermore, the development of GB projects may be impeded by a lack of government backing and legislation, and certain banks may find it difficult to bear the significant upfront expenses associated with implementing green initiatives.	Khairunnessa et al., (2021)[81].
11	Eco friendly activities and profitability	Discovered that although GB practices are still in their infancy in India, there is room for substantial future expansion. These results imply that GB practices can support sustainability while assisting banks in taking advantage of new markets and economic prospects.	Jatana and Jain (2020)[82].
12	The correlation between corporate banking and financial outcomes	Furthermore, banks may see a decrease in operating expenses as a result of GB practices. Promoting energy efficiency, for instance, can save a lot of money on energy costs for buildings and operations. Additionally, banks should avoid lending to riskier projects that could result in environmental damages and associated costs by including environmental risk assessment into lending choices.	Sangeetha et al., (2021)[83].
13	Intelligent automation	Financial performance is positively impacted by GB, particularly in the area of cost-cutting. These results imply that GB practices can support sustainability while assisting banks in cutting costs.	Charles and Nairobi (2016)[84]
14	Strategic assessment	Although GB may have some upfront costs, in the long run, the advantages of improved risk management, efficiency gains, lower costs, enhanced reputation, and regulatory compliance may exceed the disadvantages, ultimately boosting a bank's overall profitability and resilience in a world where environmental consciousness is growing.	Vijayalakshmi et al., (2021)[85].
15	Financial institutions' and regulators' roles	According to a study by the European Banking Federation, funding environmentally friendly projects can have a long-term positive impact on a bank's financial performance since they increase efficiency, reduce costs, and strengthen risk management.	Park & Kim, (2020)[86].
16	Sustainability	Additionally, implementing GB practices can improve a bank's reputation, which is crucial for drawing in customers and maintaining profitability over the long run.	Mir & Bhat, (2022)[87].
17	Foreign and Public Ownership	The impact on the performance of banks by implementing green banking practices with foreign as well as public ownership as moderating variables is examined.	Karyani, E., et al. (2020). [88]
18	Ecological conduct to propel the expansion of eco-banking in Malaysia	Examine the eco-friendly practices of Islamic bankers and their impact on the development of eco-friendly banking in Malaysia.	Ali, Q., et al. (2020). [89]
19	Impact of Green Banking on Environment	Explores the green rating guidelines, environmental policies, and programs that Indian banks have implemented.	Durani, N., (2023). [90]
20	Encourage clients to use green banking procedures.	It is imperative that the government and banks educate their clientele about the benefits of implementing environmentally friendly practices.	Pillai, R., (2019). [91]

The financial sector may play a crucial role in advancing sustainable development and reducing the effects of climate change as more banks and other financial institutions adopt GB practices and policies. (Vinoth et al., (2021)[92]).

GB possesses the capacity to revolutionize the financial sector by promoting a change in perspective towards environmental awareness, social accountability, and enduring viability. In addition to having a positive impact on society and the environment, this shift will give financial institutions new chances to prosper in a global market that is becoming more ecologically conscious and competitive.

According to a study by Ibe-enwo et al. (2019)[93], GB has a favorable impact on a company's reputation, which can enhance customer loyalty. Financial organizations can benefit greatly from the implementation of GB practices. These benefits include the ability to reduce their carbon footprint, reduce operating costs, increase client loyalty and trust, and access new markets and business opportunities (Rabea Hadi, M., et al (2023) [94]).

#### **11. RESEARCH GAP**

There has been a lot of research done in this field, most of it concentrating on different facets of green banking, like analyzing current green banking practices and developing a tool to gauge the concept of green banking. However, there isn't enough data regarding customer awareness of green banking initiatives in India. (Lodhia, S. (2015) [95]).

Green banking is an approach that is good for the environment and can boost bank profitability and customer happiness. A report claims that a number of internationally recognized specialists have initiated different aspects of green banking. On the other hand, there is a dearth of national research on green banking. The goal of this study is to close the gap. (Neu, D., et al (2006) [96]).

Although prior study has identified numerous concepts surrounding green financial issues, a complete analysis is required to close the knowledge gap regarding customer understanding of green banking initiatives in India. In conclusion, the research gap is to understand the profound and far-reaching changes that have an impact on how banks operate their internal operations and engage with their clientele.

#### **12. RESEARCH AGENDAS**

(1) Through the use of the ABCD analysis framework, the study focuses on identifying environmentally beneficial banking service activities, such as putting online banking features into place, green storage systems, and fuel-intensive alliances, to increase banking efficiencies and lower costs over time.

(2) This report aims to assess the development of green banking practices within the banking industry.

(3) It looks at how people view and react to the green policies that banks have implemented.

(4) The exploratory nature of this study aims to determine whether or not clients are aware of green banking.

(5) This study is a meager attempt to precisely pinpoint the obstacles, motivators, and legal barriers that the Indian banking industry must overcome in order to achieve sustainable development.

(6) The study's conclusion demonstrates that consumers are open to and eager to embrace the changes brought about by the banks' green initiatives.

#### **13. ANALYSIS OF RESEARCH AGENDAS :**

The research agenda highlights the focus of the study on assisting banks in navigating and capitalizing on these shifts by addressing the transformative effects of Green Banking on banking operations and consumer engagement. Sustaining competitiveness in the ever-changing financial world, meeting consumer needs, and improving operational efficiency all depend on effectively managing and taking advantage of these developments.

#### **14. FINAL RESEARCH TOPIC :**

Green Banking: Transformative Impacts on Banking Operations and Customer Engagement.

#### **15. ANALYSIS OF THE IMPACT OF GREEN BANKING PRACTICES SUPPORTED BY BANKS ON BANKING OPERATIONS AND CUSTOMER ENGAGEMENT**

An essential tool for evaluating the issue's advantages, disadvantages, opportunities, and problems is the ABCD analysis [75-84]. It helps the association understand how to assess how it presents itself and perceives the larger environment, which helps the group navigate the rough waters of competition.

**Table 9: ABCD ANALYSIS of the Impact of Green Banking Practices Supported by Banks on Banking Operations and Customer Engagement**

Constructs	Features	Reference
Advantage	(1) It reduces both client and bank operating expenses. (2) Transitioning can occur anywhere and at any moment. (3) The challenges surrounding green movements have multiplied since the start of the new age.	Orsato, R. J. (2006) [97]. Shetty, S., et al (2017) [98]
Benefit	(1) Nonetheless, both public and commercial banks began informing their staff and clients about environmental concerns. (2) Banks collaborate by recognizing and developing specific opportunities that benefit customers. (3) The banks are probably going to promote electronic banking services in order to cut down on paper work and go green.	Islam, T., et al (2021) [99] Sharmeen, K., et al (2019) [100] Nishant Jha, et al (2013) [101]
Challenge	(1) Customers may need some time to adjust to this innovative notion. (2) The usage of expensive technologies is required for green banking. (3) It demands the application of pricey new energy and recycling technologies. (4) All commercial and state banks should participate in green investment initiatives.	Shantha, A. A. (2019). [102] Goyal, K. A., & Joshi, V. (2014) [103]. Paluszak, G., et al (2016) [104]
Disadvantages	(1) It is now necessary for businesses, particularly banks, to continue to focus on environmental issues. (2) There are some banks that do not encourage their staff or clients to participate in green activities.	Soumya, S. (2019) [105] Bonin John P., et al (2005) [106]

**16. SUGGESTIONS TO IMPLEMENT RESEARCH ACTIVITIES ACCORDING TO THE PROPOSAL:**

**16.1. Study Population:**

Bank clients in the public and private sectors are included in this population.

**16.2 Data collection methodology:**

Primary data gathered from a representative sample will serve as the foundation for the study.

**16.3 Data interpretation methodology:**

The SPSS software will be used to evaluate the gathered data. We will utilize appropriate statistical tools to interpret the data, including structural equation modeling.

**IV. CONCLUSION:**

Finally, the thorough analysis of the literature has shed light on the dynamics of consumer interaction as well as operational changes, offering insightful information on a variety of green banking-related topics. The principles that direct environmentally beneficial financial service activities are explained by the conceptual framework of green banking. This review's application of the ABCD analytical approach has been helpful in pinpointing certain actions that lead to improved banking efficiency and long-term cost savings. The research underscores the necessity of continuous evaluations to gauge these improvements' efficacy in accomplishing economic and environmental objectives. It's critical to comprehend how people view and react to green policies that banks employ in order to cultivate a sustainable banking culture. The research emphasizes how crucial PR campaigns, corporate social responsibility programs, and marketing and communication strategies are in influencing the perception of sustainable banking. The review provides a thorough grasp of the transformative impacts on banking operations and consumer engagement by combining previous research. The review's conclusions not only lay the groundwork for future scholarly research, but they also have real-world applications for banks looking to improve their interactions with green-conscious customers and incorporate sustainable practices into their daily operations.

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