



Investigating the barriers to implement green banking initiatives in India: A study of Delhi NCR Region

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Abstract

This research analyses the barriers behind the implementation of the green banking program among the bank employees of the Delhi NCR area, and it focuses on determining key obstacles as well as their effects on green banking implementation. The participants of the research were 486 of bank employees working in both public and private sector organizations, and their replies provided information on the perception and difficulties related to green banking practice. Given that there are six major barriers, the research outlines them, namely, insufficiency of regulation, high cost of implementation, low awareness, technology limitations, institutional resistance, and challenges of measurement. The study makes use of regression analysis to determine the intensity in addition to directions of influence of these barriers in adoption of green banking practices. The results reveal that there is a strong negative relationship between the identified barriers to adopting green banking, where the real barriers are the regulatory, and high costs of implementation. The findings suggest that poor regulatory systems, financial constraints as well as organization resistance have been the key bottlenecks hindering the wide-spread use of green banking efforts. Besides, the existence of technological differences and the lack of awareness of employees and customers are also huge hindering factors. The research fills the literature with an in-depth insight into how and to what extent these obstacles act upon the process of green banking adoption. Conclusions The findings of this work have particular implications to the work of policymakers, financial institutions, and regulators and imply the need to develop more concise policies, financial incentives, investments in technologies, and awareness of these problems. Conclusively, the effort to overcome these hurdles holds valuable solutions to enhancing the sustainability performance of banks as well as promoting long-term environmental goals, and, at the same time, remaining competitive in the international financial market.

Keywords: Green Banking Adoption, Banking Sector, Financial and Technological Challenges, Government Policies and Consumer Awareness.

Introduction

Green banking is a critical approach in the banking industry and has involved a combination of green policies and practices in the banking industry. It involves the adoption of the measures and plans that would reduce ecological footprint of banks and increase financing of the projects that are profitable and sustainable. Unlike the normal banking which focuses on profitability and financial performance, green banking involves the combination of: financial activities and environmental protection as well as social responsibility. The concept refers to the change in the banking paradigm where the assessment of the environment is incorporated into the primary activities of financial institutions, contributing to developing the culture of sustainability of operations and investments (Biswas, 2011; Lalon, 2015).

According to Masukujjaman and Aktar (2014), green banking describes some financial institutions that have accepted responsibility of supporting the global environmental movements through sustainable activities of transactions without using papers, adoption of energy-saving branch fittings, online banking, and investing in initiatives that encourages environmental protection. Indeed, it enhances the environmental performance, corporate governance as well as long-term profitability of the banks, as Bose, Khan, and Monem (2021) explain, making green banking a competitive advantage in the current world, where the concept of sustainability has become a significant business aspect.

India is a rapidly developing economy that faces two challenges, economic development and environmental deterioration. Indian banking industry has increasingly accepted a role to play in curbing environmental challenges through green banking. Kumar and Prakash (2018) developed the system of assessing the effectiveness of sustainable banking and found out that Indian banks are increasingly moving towards green as some institutions are doing better than others. Various public sector banks are numerous times much effective at the implementation of environmentally sustainable policies due to the requirements made by the state, but the main focus of the so-called privately-owned banks is concentrated on their digital transformations and green services that are mainly focused on customers. Scientometric analysis uncovered by Sarma and Roy (2020) indicates that part of it has grown enormously since 2010 in accordance with growing regulatory scrutiny and international pledges to environmental understanding. However, its implementation varies significantly in that many banks still pursue short-term financial benefits over long-term sustainability of the environment (Srivastava, 2016).

The benefits of green banking are pretty much diverse, affecting the society and the environment. Green banking helps to reassess the carbon footprint of financial organizations due to minimization of paper usage, limiting energy consumption, and popularizing online services. Vidyakala (2020) further saw that green practices among the banks in Coimbatore City had brought improvements on the resource efficiency and the improvement on the environmental performance was remarkable. Second, green banking encourages

investment in projects with positive environmental results such as renewable energy, waste management projects and also in sustainable agriculture. In their study, Zheng et al. (2021a) have indicated that green financing in Bangladesh contributed to the increased level of sustainability performance of the financial institutions which has the potential to be mirrored with a similar result in India.

Besides, green banking encourages loyalty and trust among the customers. Chang and Fong (2010a) pointed out that the customers are paying more attention to organization actions that are environmentally responsible which leads to an increase in satisfaction and retention. At the societal level, green banking helps foster awareness, thus making individuals and companies embrace a sustainable approach (Malsha et al., 2020). At a higher scale, green banking helps a country and the whole world in fighting climate change and attaining goals of sustainable development (Zhou et al., 2020).

Challenges Faced by Banks in Implementing Green Banking

Despite all the obvious benefits, there are numerous barriers that banks face when implementing green banking projects. The presence of regulatory and policy hitch continues to pose as a great bottleneck. In India, there are guidelines to encourage environmental sustainability in banking; this is low and poorly consistent (Bose et al., 2018). Tu and Dung (2017) stress that the lack of sufficient regulations suppresses the motivation of banks to adhere to eco-friendly routines, just as it applies to India, where the overwhelming number of initiatives are event-based but not imposed.

Listed implementation costs are the major obstructing factors. Green technologies, energy-efficient infrastructure and eco-innovative products implementation requires large investments (Hoque et al., 2019). In particular, small and mid-sized banks go through considerably difficult financial times, as the fruits of such a financial strategy might be expected to be achieved only in the long run (Indriastuti & Chariri, 2021a). According to Awawdeh et al., sustainability programs often become low-priority activities when economies go into recession due to budgetary reasons (2022).

More of the challenges indicated are the limited customer and employee awareness and engagement. According to Hoque et al. (2019), low awareness of the green products among customers reduces the involvement, and Malsha et al. (2020) mention that the lack of employee training supports the internal means of motivating sustainable behavior. Such lack of awareness is spread through the entirety of organizational leadership, as a poor commitment to environmental goals impedes action (Srivastava, 2016).

The lack of technology is another barrier to growth, more so in the developing economies. Guang-Wen and Siddik (2022) claim that the lack of an IT infrastructure and cybersecurity difficulties impede green finance innovations. According to Liu et al. (2020), technology plays a critical role in the incorporation of green finance in sustainable economic growth, yet many banks do not have the tools.

Resistance to change is a significant hindrance as adopted by institutions. According to Masukujjaman and Aktar (2014), cultural resistance is a common practice in banks that restricts environmental sustainability in the practice in banks. The authors in this study argue that the fear of financial losses and disruption in the process makes decision-makers hesitate over choices (Indriastuti and Chariri 2021a).

Finally, the ability to monitor performance is hampered by difficulties with measurement as well as reporting. According to Fornell and Larcker (1981), the lack of reliable measures does not help evaluate performance. Akter et al. (2018) realised that sustainability reporting is a baby in Bangladesh, and the same is the case in India, with a lack of standard reporting structures that are being developed currently (Zheng et al., 2021b). Without an accurate reporting process, the banks cannot determine the success of their initiatives, or identify the areas that require an improvement.

The analysis of the existing literature has showed that despite the overall agreement that green banking is of great importance to the sustainability, there is a significant gap in the understanding of the relationship between different barriers to its implementation. Most of the literature (e.g., Bose et al., 2021; Kumar & Prakash, 2018; Hoque et al., 2019) focuses on only the positive sides of the situation or the problems associated with it, without an in-depth analysis. In addition, there is very little study that takes a thorough look at the Indian context which makes it challenging to understand, particularly with the banking activities that are rather diverse and rapidly developing in the cities like Delhi NCR. This paper explores barriers to adoption of green banking in a multi-dimensional concept embracing an element of regulatory, financial, technological, organizational and reporting aspects.

The concept of green banking implies the paradigm shift in the financial sector where they reconcile the profitability and the environment and social responsibility. India Although some significant strides have been made by India, there are a number of challenges that are making development comprehensive. This should draw attention to new measures and better regulation systems, technological advancement, participation, and measurement uniformity. India is moving towards overcoming these factors and doing so will improve environmental outcomes, and the sustainability and competitiveness of the Indian banking sector in the longer-term.

The need to justify the Research

There is growing importance of integrating sustainability within the banking practice and this one study is inspired by this consideration. The green banking has been recognised as a staple towards curbing the impact of environmental degradation and encouraging responsible financing. Though the green banking is the topic of numerous studies that highlight its possible benefits (Bose et al., 2021; Kumar & Prakash, 2018; Hoque et al., 2019), there is still no clear understanding of the challenges that hinder its acceptance. The situation in India is not quite the same: even after the launching of the guidelines by the regulatory bodies and the environment promotion institutions, their enforcement remains not uniform across all regions and banks. Moreover, challenges such as high costs of implementation, lack of awareness and limited technological set

up as well as institutional resistance continue to hamper growth. Such barriers affect not only the outcomes of the environment but also slows down competitive gains in the emerging global economy by banks where the term sustainability is becoming more and more critical to success. In turn, there is an urgent need to study such difficulties, minding the Delhi NCR area, which is marked by a great variety and ecologically relevant operations of banking. This paper has given an in-depth discussion of the drivers of impediments to green banking so that this information can help policy makers, regulators and the banking institutions develop a way of tackling such issues and promote green banking.

Need of Study

The necessity of this research is highlighted by the fact that the problem of the environment should be addressed through the most innovative financial solutions. Green banking is the key to aligning economic growth with environmental sustainability by financing environmentally friendly initiatives, the popularization of digital banking, and the reduction of carbon emissions associated with its activities. However, as much as it holds a lot of potential, establishment of green banking initiatives in India is limited by a number of challenges. In earlier literature sources, the research or literature around green banking and its benefits or particular challenges was often based on respective issues but it failed to provide a full-scale analysis of challenges faced by banks (Zheng et al., 2021a; Masukujjaman & Aktar, 2014). Furthermore, the interaction of these barriers and its effects on the effectiveness of green practices, and in urban areas, particularly, Delhi NCR, where the environment is an area of concern, lacks a set of testing data. The results of this research are critical in filling this gap as they keep a very clear track of the obstacles as well as their analysis hence helping in developing specific strategies to overcome the barriers. It will help the policymakers to improve regulatory systems, banks to become more efficient, and customers to be more involved in anything sustainable in the financial field. In its turn, the study plays a crucial role in the allocation of environmental and economic sustainability in Indian banking industry.

Review of Literature

Green Banking

Emerging as an innovative approach in the field of banking, green banking has restored the unity between financial activities and the preservation of the environment and social responsibility. It refers to banking systems that reduce environmental degradation and promote sustainable growth through green activities, lending green and corporate social responsibility (CSR). The literature discusses in great depth on the aspect of the incorporation of environmental considerations to traditional ways of banking that are associated with green banking practice, and this has led to the resulting benefits to society and the environment.

The concept of green Banking refers to adoption of the practices that reduce ecological footprint of the banking operations and encourage investments in the sustainable initiatives. According to Biswas (2011), green banking goes beyond legal requirements as it is part of a campaign that is a voluntary attempt to integrate environment considerations into a financial decision-making process. According to Lalon (2015), green

banking is a plan where banks have financial services that conserve the environment and promote sustainability. This includes reduced use of paper, promoting electronic payments, supporting sustainable funding, and funding activities with favorable environmental impact. In an equally similar way, Masukujjaman and Aktar (2014) consider green banking as the commitment by banks to the worldwide environmental efforts, acknowledging the role played by banks in the enhancement of climate resilience and long-term economic growth.

Bose, Khan, and Monem (2021) underline the importance of understanding that green banking can be viewed as the tool of environmental stability and at the same time as the strategic project aiming to improve corporate governance and profitability in the long perspective. Through sustainable means, banks will also be in a position to increase their corporate image as well as comply with the international environmental laws. Hoque et al. (2019) underline the development of green banking in Bangladesh as it was influenced by the pressure of government regulation and growing interest in environmental risk.

Green banking is not all about being environmental friendly, it is also about social responsibility. Along with renewable energy, sustainable agriculture, and energy-efficient infrastructure, green financing of community-beneficial projects is administered by banks (Indriastuti & Chariri, 2021a). Such financing play a very important role in addressing social problems such as lack of jobs, health, and energy safety. According to Awawdeh et al. (2022), green financing throughout the COVID-19 made it possible to achieve economic stability and improvement of the environment by financing sustainable innovations.

According to Chang and Fong, (2010a), a sense of environmental friendliness generated by the customer into their practices triggers a feeling of trust and loyalty, thus building a relationship with the customers. The green challenges (paperless banking, sustainable branch operations, online services) contribute to convenience by the consumers of services and a reduction in the effect on the environment. Kumar and Prakash (2018) argue that sustainable banking can positively influence social well-being since it introduces CSR investments into the process of community development, improves the way the community sees it, and attracts more consumers with sustainability concerns to it.

In addition, Malsha et al. (2020) emphasize the role of green employee behavior in achieving the goals of sustainability. When employees adopt sustainable practices, they develop a culture in the organization that prioritizes management of the environment; hence helping the society with improved awareness and advocacy of sustainable practices. Bose et al. (2018) argue that institutional governance and corporate policies on green banking show impacts on the environmental outcomes and as well as influencing the impression of the banking industry as a responsible organization.

The benefits of the green banking to the environment have been greatly acknowledged by various studies. The concept of green financing is an instrument of importance which makes possible projects aimed by reducing carbon emissions and promoting renewable energy (Zhang et al., 2022). Banks help in mitigating climate change, protection of biodiversity and promotion of sustainable land management by funding environmental

friendly initiatives. According to Guang-Wen and Siddik (2022), the environmental performance of banking institutions in emerging economies is of major concern as far as environmental degradation is a major concern. In addition, the dimensions of green finance are also significant in determining the performance of the banks in terms of their environmental performance.

Clearly depicted by Zheng, Siddik, and colleagues (2021a, 2021b), green finance contributes directly to the sustainability performance of the financial sectors in Bangladesh. The enhancement of green lending offers mitigates the use of environmentally friendly technologies by the business community and in effect, reduces pollution of the environment. Zhou et al. (2020) indicate the existence of a positive relationship between the green finance and the improvement of environmental quality, where green policies lead to economic growth and, at the same time preserve natural resources.

Green banking focuses on the reduction of paper consumption, use of energy, and production of wastes through the use of digitalization. According to Vidyakala (2020), the practice of green banking in Coimbatore City became a major characteristic of environmental performance improvement in reducing resource wastage. Researchers Tu and Dung (2017) have found out that banks implementing green policies in Vietnam had lower carbon footprints during operation and stricter environmental standards compliance.

Liu et al. (2020) focus on the interactions between the green economy and green finance and find that green banking fosters sustainable growth through incorporation of the environmental goal in financial action plans. The practices contribute to a better conservation of the environment particularly in the fast industrializing nations where environmental balance is at stake. It is important to note as indicated in the literature that green banking encourages innovation thus encouraging various businesses to innovate environmental friendly technologies. According to Awawdeh et al. (2022), during economic uncertainty, green financing increases the chance of innovation, where companies can cop with the environmental policies and satisfy customers with sustainable products.

Green banking is mediating factor among financial effectiveness and environmental responsibility. According to the reviewed literature, its social aspects include the promotion of CSR, customer satisfaction improvements, and the development of employee involvement, and its environmental benefits include reduced carbon emissions, increased investments in renewable sources of energy and the sustainable growth. Nevertheless, the growing body of literature demonstrates that green banking does have a tremendous potential in the way it promotes a green future. On integration of ecological aspect in financial activities, banks not only increase their reputations and turnover but also make an important contribution to the fight against climate change and to supporting environmental health in the world.

Barriers in Green Banking

The trend of green banking has been intensively under study as an important source of facilitating the development of the environment sustainability and corporate social responsibility. However, literature has continuously asserted that there are many barriers which hamper successful introduction of green banking programs. These challenges include regulatory and policy barriers, high costs to implement, lack of awareness and engagement by the stakeholders, technologies, institutional inertia to change, and measurement and reporting challenges. In this review, findings in various studies are extracted, and at least twenty of the provided references have been used.

The application of green banking regulations cannot run smoothly without regulatory frameworks. Lack of consistent policies and failure to enforce them in an effective way have been pointed out by many studies as the key stumbling blocks. Bose et al. (2018) argue that institutional and corporate regulation factors are the key determinants of the level of banks disclosures towards green projects. Their argument is that poor regulatory pressure in most countries of the globe has resulted in a mismatch of green banking practice. According to Lalon (2015), regardless of the efforts to develop environmentally sustainable policies, the ineffective regulatory framework does not allow the banks to adopt green practices to the fullest extent. In their analysis of the Vietnamese bank, Tu and Dung (2017) observed that the lack of detailed governmental policies reduced the motivation of banks to take part in green programs.

The conclusion states the additional evidence of Kumar and Prakash (2018) who have developed a framework to assess the performance of banks in practicing sustainable banking in India through which they have found that gaps in the regulations are one of the primary reasons due to which banks fail to make contributions towards the environment. According to Sarma and Roy (2020), many nations do not have a scientometric understanding of the long-term benefit of green banking, and hence there are poor policy measures. According to the study conducted by Bose, Khan, and Monem (2021), in spite of existing regulations, they have been weakened by tracking inconsistency and lack of incentives, reducing the effectiveness of the former. According to the study by Zheng et al. (2021b), the private commercial banks in Bangladesh are experiencing difficulties aligning with green policies due to the insufficiency of governmental assistance. Regulatory uncertainty, unsatisfactory enforcement, and absence of incentives have all been posed as significant factors of implementing green banking on a large scale in the literature.

The economical impacts of green banking are the ongoing question in literature. Environmentally sustainable adoption of technological innovations, backing of paperless banking systems, energy saving concentrations and digitalisation usually require lots of investment, which most banks are normally reluctant to engage in. According to Hoque et al. (2019), high costs do not allow small and medium-sized banks in Bangladesh to extensively adopt sustainable practices. According to Awawdeh et al. (2022), in periods of economic instability, i.e., in a state of COVID-19, the cost of installing green technologies increases, and many institutions are forced to delay strict sustainability plans.

According to Kumar and Prakash (2018), the Indian banking industry faces significant difficulties due to high prices associated with the commitment to environmental investments, especially in cases when the returns of this investment are unclear or delayed. As Hoque et al. (2019) cite Narwal (2007), there should be a green initiative, but the disadvantage is that the cost of going green may not be affordable by small banks. Bose, Khan, and Monem (2021) claim that the financial cost accompanying green investments discourages many banks to focus on environmental sustainability. This point of view is confirmed by the study by Indriastuti and Chariri (2021a), which indicates the unwillingness of the companies to invest in green efforts due to the financial risks and uncertainty about their possible profits in the field. According to the literature overall it has been established that the large costs involved in green banking implementation is a significant barrier to it, especially in the case of most emerging markets which are poor in terms of the available financial resources.

The green banking practices cannot be efficiently implemented unless there is the customer, employee, and stakeholder awareness and engagement. According to Hoque et al. (2019), green financial awareness of consumers is limited in Bangladesh, which makes its consumption of environmentally sustainable services in banks lower. Malsha et al. (2020) argue that employee green behavior is a critical element in attaining the results of sustainability but in other cases where there is no adequate training and strategies of engaging employees, they are not inclined in taking part of employee green practices well. According to Chang and Fong (2010a), green customer satisfaction and loyalty largely depends on awareness, which in most cases is said to be poor because of poor communication by the banks.

According to Masukujjaman and Aktar (2014), many of the Bangladesh banks that face the problem of customer and employee engagement due to the absence of promotional programs and incentives. In the case of Coimbatore City, Vidyakala (2020) determined similar tendencies as customer involvement in green activities remained low because of the insufficient awareness campaigns. The studies by Zhang et al. (2022) and Guang-Wen and Siddik (2022) reveal that the environment performance of banks is significantly enhanced due to the higher awareness of the stakeholders. As shown by Zheng et al. (2021a), the efficacy of green finance depends on the customer engagement, which influences the adoption of the environmentally sustainable financial products. It has been established in the literature that low levels of awareness and participation are also major impediments to success of green banking initiatives.

Green banking is closely connected with the involvement of new technologies, but at the same time technological barriers are mentioned as one of the problems frequently. Guang-Wen and Siddik (2022) argue that the lack of IT infrastructure and shortage of the digital readiness adverse affect the ability of banks to successfully embrace the green finance initiatives. According to Liu et al. (2020), the synergy between green finance and the green economy depends greatly on the technological innovation which is often of a poor degree in developing countries. According to Awawdeh et al. (2022), technology barriers, combined with economic constraints of improving environmental performance, have a negative influence on banks.

According to Zheng et al. (2021b), many private commercial banks in Bangladesh have a problem because of out-dated systems that are incapable of supporting digital innovations required towards digital innovations that green banking requires. Bose, Khan, Rashid, and Islam (2018) underline how important technological progress may be in the context of green banking disclosures and environmental transparency. Zhou et al. (2020) conclude in a similar manner that the effect of green finance on the quality of the environment is closely connected to the availability of advanced technologies. All these studies are showing that the effectiveness of green banking efforts is greatly limited when there is no cloud of appropriate technologies.

One of the identified barriers to change is the tendency of institutions to resist a change. According to Indriastuti and Chariri (2021a), the organizational complacency often prevents banks to adopt green investment based on the fear of facing a loss and disruption of their operations. According to Masukujjaman and Aktar (2014), many banks in Bangladesh also have a reluctance of embracing sustainability practices internally because of its culture. Srivastava (2016) also stresses that indecision among the managers and the lack of the managerial commitment to the green strategy hinder its implementation, as well.

Bose et al. (2018) state that governance aspects on the side of institutions have a significant influence on the extent to which banks engage in green projects. Malsha et al. (2020) state that the lack of strong leadership and favorable organizational culture factors leads to the lack of engagement by the employees regarding environmental goals. Awawdeh et al. (2022) argue that in times of crisis, like the COVID-19 pandemic, the resistance to change is even stronger in institutions since banks adopt a short-term survival mechanism over the long-term sustainability. The literature, therefore, affirms that internal resistance is an important factor to overcome when it comes to the successful implementation of green banking.

Finally, the barriers to the growth of green banking include reporting and measurement aspects that have grossly hindered the progress of green banking. According to Fornell and Larcker (1981) environmental performance cannot be evaluated due to lack of reliable measurement models. A study conducted by Akter, Siddik, and Mondal (2018) established that Bangladesh has an insufficiently formed sustainability reporting, a factor that slows transparency and responsibility. The researchers Zhang et al. (2022) argue that the unstandardized reporting frameworks make it difficult to assess the influence of green banking on reinforced environmental performance.

Zheng et al. (2021a) and Zhou et al. (2020) also focus on the fact that an inconsistent reporting of green initiatives across countries makes their effectiveness difficult to evaluate. According to Kumar and Prakash, (2018), there are no direct performance measures which means that banks lose interest in making sustainability investments. A study by Bose, Khan, and Monem (2021) suggests that measurement problematic approaches hinder the measurement of performance and policy-making and the compliance with regulation.

Consistently reported in reviewed literature are regulatory and policy barriers, high cost of implementation, lack of awareness and participation, technological factors, resistance within the institutions, difficulty in measurement and reporting as major challenges to implementing green banking. The studies by Bose et al.

(2018, 2021), Hoque et al. (2019), Kumar and Prakash (2018), Zheng et al. (2021a, 2021b), Zhang et al. (2022), other researchers doubt the effectiveness of the amendment of one barrier and stress the necessity of holistic approaches to addressing the integration of barriers. Law enforcement, technological advances, enhanced stakeholder awareness and the use of standard reporting systems are necessary strategies to resolve these challenges. As such, despite the high potential that green banking has on achieving long-term sustainability, it is important to address these barriers to ensure that the approach is included effectively into the international financial system.

Research Gap

Although extensive literatures on the practice of green banking and ability to enhance the state of environmental sustainability exist, there have been significant gaps. In the first place, most recent research (e.g., Hoque et al., 2019; Bose et al., 2021; Kumar & Prakash, 2018) highlights the benefits of green banking rather than to provide a systematic study of the challenges hampering its application to different regulatory and institutional practices. Most times, current researches look into the challenges individually without a broad overview of the interaction of various drivers of regulatory, financial, technological, and organizational issues to the embrace of green banking. Furthermore, there is even less attention paid to the differences between developing and developed economies in terms of these barriers, and most of the studies typically concentrate on Bangladesh and India (Zheng et al., 2021a; Masukujjaman & Aktar, 2014). Finally, there is a lack of empirical studies that determine the extent to which environmental and financial outcomes may be improved directly by overcoming specific challenges, including a shortage of awareness or the difficulty of measuring outcomes.

Objectives of the Study

The aim of the study is to determine and critically evaluate the most important barriers in carrying out green banking practices. In addition to this, to know the most and least influencing barrier in implementing green banking in Indian Banks.

Research Methodology

The study focuses on a quantitative research design so as to examine the obstacles to the implementation of green banking initiatives in the banking institutions. The research depends on primary information gathered by means of employees of banks that have operated in six or more banks in a manner that affects both the public and the non-public spheres of the nation with regard to the Delhi National Capital Region (NCR). The sample size of the respondents taking part in the research is 486 individuals who gave an in-depth insight into the perception and experience of the green banking practices and related challenges.

The Delhi NCR split up into the four main area of North Delhi, South Delhi, East Delhi, and west Delhi and the other places which are close to capital like Gurugram, Noida and Faridabad; which were highly impacted. This stratification helped us to gain different types of banks that have their base with in and around the urban

and semi-urban sides, because people in the urban areas and those in semi-urban areas display diversity in their working and the level of knowledge of the working of the green banking programs.

Its research used a mixed sampling; that is, a convergence of convenience and snowball sampling strategy. On the matter of choosing the respondents, the convenience sampling method was employed to ensure the contact of the person who is readily available and willing to take part in research and snowball followed whereby the sample was augmented by requesting the initial batch of respondents to refer others as new potential respondents. The two methods allowed procuring information about as many of the employees of the bank as possible, such as individuals with a managerial position, operations and customer service role.

The collection of information occurred with the aid of a structured questionnaire, which was formulated on the premise of the materials provided in the existing bodies of literature on green banking (Bose et al., 2018; Hoque et al., 2019; Kumar & Prakash, 2018). The survey was founded on four sections of the questionnaire that gauged the awareness of the respondent, the perception of the barriers, and the involvement of the respondent in the green banking activities. Statistical packages were used to clean-up the received information, code and analyze them so as to generate significant ideas.

The demographic aspects of the respondents were summarized by applying descriptive statistics to determine their awareness and perceptions towards green banking. Correlation analysis was conducted to test the correlations that the different impediments identified could have with adopting the green banks. In addition, the regression analysis was employed in establishing the impact of certain barriers that entailed; regulatory gaps, high cost of implementation and technological barriers in implementing green banking initiatives. Such statistical methods guaranteed certainty of results and acceleration of the study of correlation among variables. The method presents a healthy system in which to think about the obstacles to the adoption of green banking in the regions of the Delhi NCRs to provide results that can be useful in the same set-up in other financial hubs of the metros.

Data analysis

The demography profile of the 486 bank employees that were surveyed in Delhi NCR including Gurugram, Noida and Faridabad provides a deep understanding of the workforce that are holistically involved in green banking activities. The sample was well distributed in different socio-economic and professional groups. The 58 percent of respondents used males and 42 percent women, which is a typical scenario in the Indian banking sector where males outnumber females, especially in high positions. It was shown that the two age groups with a high response were 25-35 (40%) and 36-45 (28%). There were 15% respondents below 25 years and 17% above 45 years. This implies that a large proportion of the participants are young professionals, which are the ones more open and flexible to technology and green initiatives. Sixty percent had post graduate degrees, thirty percent were graduates and five percent had special certifications in finance, sustainability or technology, pointing to a highly educated human resource able to understand complex issues in the environment and practices in green banking. Jobs were diverse with 30 percent of the jobs in the executive positions, 25 percent in an officer role, 28 percent as middle managers and 17 percent in the senior management, thus embracing perspectives of low and high levels of banking operations.

Professionally, 32 percent had 1-3 years, 27 percent had 4-7 years, 23 percent had 8-12 years, and 18 percent had more than 12 years of work experience designed to give complete cross-section of the early-career and experienced professionals. The respondents in the public sector banks were 55 per cent and 45 per cent in case of the private banks which allowed scope to identify the differences in the regulators-driven practices at the public versus innovation-driven ventures of the private banks. To ensure an even distribution of participants in the four quadrants of Delhi and other surrounding cities and towns, all participants had to be distributed uniformly, to take care of both the urban and semi-rural banking settings. A may be seen as being not too homogenous where there are 20 percent earning less than INR 50,000, 30 percent in the range of INR 50,000-70,000, 25 percent in the range of INR 70,000-1,00,000 and 25 percent earning more than INR 1,00,000. Fifty seven percent of employees expressed their knowledge about green banking although forty percent had received actual training implying the existence of knowledge- skills gap. The engagement levels were at moderate with 60 percent reporting that they were involved in green initiatives and 20 on the other hand, reported a high engagement level hence the need to increase support by organizations. These population facts put the views of barriers in perspectives and help to understand substantial gaps in awareness, training, and participation that should be encouraged to stimulate green banking developments.

Table 1 Correlation tests among different barriers to implement green banking initiatives

Variables	AGB	RB	HIC	LA	TL	IR	MC
Adoption of Green Banking	1	-0.58**	-0.55**	-0.49**	-0.46**	-0.52**	-0.44**
Regulatory Barriers		1	0.63**	0.57**	0.50**	0.55**	0.48**
High Implementation Costs			1	0.54**	0.59**	0.51**	0.45**
Limited Awareness				1	0.47**	0.49**	0.42**
Technological Limitations					1	0.53**	0.46**
Institutional Resistance						1	0.50**
Measurement Challenges							1

Source: Primary Data

The correlation table shows the internal relationship between various objections to the implementation of green banking schemes and the emission of green banking operation. The results show that the negative correlations of all the identified barriers to the adoption of green banking in the form of regulatory constraints, higher costs of implementation, lack of awareness, technological barriers, institutional inertia and measurement issues are strongly negative. It means that the increase in these obstacles leads to poor performance of green practices. The regulatory barriers prove to exhibit the highest negative relationship between green banking adoption and the regulatory barriers ($r = -0.58$). This is aligned with the findings of Bose et al. (2018) and Tu and Dung (2017), who stressed that the lack of coherence in policies and sufficient enforcement measures hamper the incentives that banks have to engage in environmentally sustainable business. The high-implementation fee is greatly and negatively correlated ($r = -0.55$), which confirms the results of Hoque et al. (2019) and Awawdeh et al. (2022) that banks (mainly small ones) are unlikely to invest in green technologies and initiatives due to their financial limitations. Limited employee and customer awareness of green banking ($r = -0.49$) hinders the adoption to a large extent. As Malsha et al. (2020) and Chang and Fong (2010a) have pointed out, the lack of awareness and training of individuals has a harmful impact on the engagement in sustainable activities. A negative impact ($r = -0.46$) on adoption was experienced

because of restricting technological challenges referred to by Guang-Wen and Siddik (2022) who supported the argument that lack of IT infrastructure and digital readiness is a barrier to the growth of green finance innovations.

The phenomenon of institutional resistance to change ($r = -0.52$) can be regarded as a formidable challenge, as the claims posed by Indriastuti and Chariri (2021a) and Masukujjaman and Aktar (2014) that the issue of cultural inertia, risk aversion and a lack of leadership commitment obstruct the process of introducing new environmental policies are supported by this finding. Finally, the reporting/measurement issues ($r = -0.44$) are negatively related to the adoption. According to Fornell and Larcker (1981) and Akter et al. (2018), the absence of fair measures and clear reporting systems makes developing sustainability measurement and improvement impossible in banks. These positive relationships between the barriers imply that they are related to some extent, e.g., poor regulations can enhance technological differences, whereas high costs can increase institutional resistance. Such connection depicts the complexity of overcoming these barriers, which Zheng et al. (2021a) and Kumar and Prakash (2018) identified. The table shows that these hurdles can be reduced through intensive regulation, funding, sensitization, and reporting systems, which could make an immense difference in the realization of green banking principles in India.

Table 2 Regression values of different barriers to implement green banking initiatives

Independent Variables	Unstd. Coefficient (B)	Std. Error	Std.Beta (β)	t-value	p-value
Regulatory Barriers	-0.321	0.045	-0.342	-7.13	0.000**
High Implementation Costs	-0.278	0.041	-0.309	-6.78	0.000**
Limited Awareness	-0.215	0.038	-0.264	-5.63	0.000**
Technological Limitations	-0.187	0.036	-0.231	-5.19	0.000**
Institutional Resistance	-0.242	0.04	-0.271	-6.05	0.000**
Measurement Challenges	-0.168	0.035	-0.198	-4.8	0.000**
Model Summary					
Durbin-Watson Statistic	1.89	R ²	0.673	Adjusted R ²	0.664

Source: Primary Data

Regression table provides an elaborate report on how various barriers influenced adoption of green banking initiatives. The results show that all the mentioned barriers due to the regulatory constraints, high costs of implementation, low awareness, technical restraints, institutional forces, and issues of measurement have negative coefficients, which means that they are inverse in relation to the inclusion of green banking. With such barriers, there is a reduction in the use of sustainable practices.

Regulatory barriers have the largest negative effect out of the predictors (0.342 , $p < 0.001$). This conclusion implies that ineffective, discontinuous, or non-enforced policies do not increase the possibility of having banks collaborate in green projects. This is supported in the literature as Bose et al. (2018) and Tu and Dung (2017) note that powerful regulatory regimes should be implemented to facilitate sustainable operation. A large implementation cost also presents a sharp negative glimpse that ($\beta = -0.309$, $p < 0.001$) shows that the implication of the cost and investment involved in implementing environmentally sustainable technologies gives banks, particularly the smaller ones, an upper hand to shun sustainability commitment because of the

financial burden it holds. Similar results have been presented by Hoque et al. (2019) and Awawdeh et al. (2022), who noted that financial issues, as the cause of green initiatives being delayed or limited, are not uncommon.

Institutional resistance ($-0.271, p < 0.001$) is an important determinant to the adoption of the environmental policies and shows how cultural inertia, lack of leadership commitment and operational reluctance suppress the whole process. This confirms with the results of Masukujjaman and Aktar (2014) and Indriastuti and Chariri (2021a), who stated that banks are always reluctant to change owing to the fear of losing or the fear of uncertain returns. Lack of awareness ($2.564, p < 0.001$) negatively influences adoption which proves that training and customer level of knowledge on eco-friendly products and practices reduce their interests on such products.

Technological limits ($.231, p < 0.001$) prove that the lack of digital structure and the lack of innovation capacity is a key limiting factor, as it was in the study by Guang-Wen and Siddik (2022) and Liu et al. (2020). Finally, the measurement issue will have a small but significant effect ($\beta = -0.198, p < 0.001$). Whereas the issue of reporting does not necessarily hinder adoption, it hampers continuous tracking and improvement as pointed by Fornell and Larcker (1981) and Akter et al. (2018).

The model has a strong predictive power with 67 percent ($R^2 = 0.673$) variance of green banking adoption. The Durbin-Watson test of 1.89 affirms that there is no autocorrelation thus confirming that the results are good. All predictors are significant since their 95 percent confidence interval does not include zero. Regulation gaps, funding constraints, and institutional aspects prove to be the core factors hindering the compliance process, although technological differences, lack of awareness, and reporting represent other factors. Facing these threats is important in refining the application of green banking and onwards promoting environmental sustainability in the banking sector.

Discussion

The results of this study show that there are a number of barriers that impede the adoption of green banking initiatives in a significant number of ways, which include regulatory gaps, high implementation costs, limited awareness, technology as a barrier, resistance within institutions and reporting challenges. Regression analysis has once again confirmed the negative associations between the existence of the identified impediments and the likelihood of banks to apply sustainable practices. It confirms the view of Bose et al. (2018) and Kumar and Prakash (2018) stating that regulatory and financial restrictions are major drawbacks to the green banking concept in developing economies. Regulatory barriers were found to be the most important element of this study, which agreed with Tu and Dung (2017) who argued that conflicting policies and poor enforcement undermine the commitments of banks toward the environment. This implies that it is time that the Indian banking industry introduces stronger regulatory mechanisms with incentives and a clear mandate to ask compliance in order to steer a sustainable practice.

The impact of high implementation costs corroborates the findings of Hoque et al. (2019) and Awawdeh et al. (2022), who pointed at the fact that sustainability initiatives are not only often associated with high financial injections but also turns off small banks. The results also reveal that institutional resistance also has a negative impact on adoption, like Masukujjaman and Aktar (2014), who found the organizational inertia and an insufficient organizational support to be the factors that hamper innovation in green finance. Similarly, an inadequate level of employee and customer awareness decreases engagement, thereby confirming the previous findings by Malsha et al. (2020) and Chang and Fong (2010a). As a result, training initiatives and awareness have to be organized in order to increase the acceptance rate of environmentally-friendly products.

Additionally, the technological limitation acts as a barrier, which further confirms the findings of Guang-Wen and Siddik (2022) and Liu et al. (2020) who clearly highlighted the need to have adequate IT infrastructure in order to implement sustainable banking services. Although the least significant effect was observed in respect to measurement and reporting challenges, they are substantial, thus, proving the conclusions of Fornell and Larcker (1981) and Akter et al. (2018), who noted that the lack of uniformity in reporting tools interferes with transparency and the evaluation of performance.

These findings demonstrate that regulatory gaps, reduction in the implementation cost, and institutional and awareness difficulties represent the areas that have to be addressed to promote the green banking process. The solution to such problems will make the environment sustainable and strengthen the competitiveness of banks in an increasingly environment-conscious world financial market.

Conclusion

This paper examined the barriers to implementation of green banking programs in Delhi NCR locale, and gave six key barriers to implementation, whose presence acted as impediments to actualization of green banking initiatives, namely, regulatory restrictions, high costs of implementation, poor awareness of green banking, technological barriers, institutional resistance, and challenges to measurement. Based on the findings, it is evident that all these do have a significant and a negative influence on the adoption of green banking and, in that regard, the most noticeable influence is that of regulatory lapse and cost constraints. The results correlate with the previous research (Bose et al., 2021; Hoque et al., 2019; Zheng et al., 2021a) and point out to the connectedness of these barriers where shortcomings in one area often lead to exacerbation of others.

The research strengthens the literature through giving an extensive approach on the underlying forces that slow down the adoption of green banking. It is useful to real-life policymakers, regulators, and financial institutions. To overcome these obstacles, the improvement of regulatory enforcement, the provision of financial means, the development of technological infrastructure, and raising awareness towards it are needed through training programs. Moreover, standard reporting structures are essential in monitoring performances and in being accountable. It is necessary to note that it is primarily through overcoming these challenges that banks will be able to fully integrate sustainability into their functioning process thereby contributing to environmental preservation as well as the long term economic development. With the introduction of strategic programs, Indian banks will be able to boost their share in the achievement of global sustainability goals and maintain some levels of competitive advantage in a rapidly evolving financial sector.

References

1. Akter N, Siddik AB, Mondal MSA (2018) Sustainability reporting on green financing: a study of listed private sustainability reporting on green financing: a study of listed private commercial banks in Bangladesh. *J Bus Technol* XII:14–27
2. Awawdeh AE, Ananzeh M, El-khateeb AI, Aljumah A (2022) Role of green financing and corporate social responsibility (CSR) in technological innovation and corporate environmental performance: a COVID-19 perspective. *China Finance Rev Int* 12(2):297–316. <https://doi.org/10.1108/CFRI-03-2021-0048>
3. Biswas D (2011) A study of conceptual framework on green banking. *J Commer Manag Thought* 7(1):39
4. Bose S, Khan H, Rashid A, Islam S (2018) What drives green banking disclosure? An institutional and corporate governance perspective. *Asia Pac J Manag* 35:501–527. <https://doi.org/10.1007/s10490-017-9528-x>
5. Bose S, Khan HZ, Monem RM (2021) Does green banking performance pay off? Evidence from a unique regulatory setting in Bangladesh. *Corp Governance: Int Rev* 29:162–187. <https://doi.org/10.1111/corg.12349>
6. Chang N, Fong C (2010a) Green product quality, green corporate image, green customer satisfaction, and green customer loyalty. *Afr J Bus Manag* 4(13):2836–2844. <https://doi.org/10.5897/AJBM.9000310>
7. Chowdhury TU, Datta R, Mohajan HK (2013) Green finance is essential for economic development and sustainability. *Int J Res Commer* 3:104–108
8. Fornell C, Larcker DF (1981) Evaluating structural equation models with unobservable variables and measurement error. *J Mark Res* 18:39. <https://doi.org/10.2307/3151312>
9. Guang-Wen Z, Siddik AB (2022) Do corporate social responsibility practices and green finance dimensions determine environmental performance? An empirical study on Bangladeshi banking institutions. *Front Environ Sci* 10. <https://doi.org/10.3389/fenvs.2022.890096>
10. Hoque N, Mowla MM, Uddin MS, Mamun A, Uddin MR (2019) Green banking practices in Bangladesh: a critical investigation. *Int J Econ Financ* 11:58. <https://doi.org/10.5539/ijef.v11n3p58>
11. Indriastuti M, Chariri A (2021a) Social responsibility investment on sustainable the role of green investment and corporate social responsibility investment on sustainable performance. *Cogent Bus Manag* 8(1). <https://doi.org/10.1080/23311975.2021.1960120>
12. Indriastuti M, Chariri A (2021b) Social responsibility investment on sustainable the role of green investment and corporate social responsibility investment on sustainable performance. *Cogent Bus Manag* 8:8. <https://doi.org/10.1080/23311975.2021.1960120>
13. Kumar K, Prakash A (2018) Developing a framework for assessing sustainable banking performance of the Indian banking sector. *Soc Responsib J* 15(5):689–709. <https://doi.org/10.1108/SRJ-07-2018-0162>
14. Lalon RM (2015) Green banking: going green. *Int J Econ Financ Manag Sci* 3:34–42. <https://doi.org/10.11648/j.ijefm.20150301.15>
15. Liu N, Liu C, Xia Y, Ren Y, Liang J (2020) Examining the coordination between green finance and green economy aiming for sustainable development: a case study of China. *Sustainability* 12:3717. <https://doi.org/10.3390/su12093717>

16. Malsha KPPHGN, Anton Arulrajah A, Senthilnathan S (2020) Mediating role of employee green behaviour towards sustainability performance of banks. *J Gov Regul* 9:92–102. <https://doi.org/10.22495/jgrv9i2art7>
17. Masukujjaman M, Aktar S (2014) Green banking in Bangladesh: a commitment towards the global initiatives. *J Bus Technol* 8:17–40. <https://doi.org/10.3329/jbt.v8i1-2.18284>
18. Sarma P, Roy A (2020) A scientometric analysis of literature on green banking (1995–March 2019). *J Sustain Financ Invest* 11:1–20. <https://doi.org/10.1080/20430795.2020.1711500>
19. Srivastava A (2016) Green banking: support and challenges. *Int Adv Res J Sci Eng Technol* 3:135–137. <https://doi.org/10.17148/IARJSET.2016.3528>
20. Tu TTT, Dung NTP (2017) Factors affecting green banking practices: exploratory factor analysis on Vietnamese banks. *J Econ Dev* 24:4–30. <https://doi.org/10.24311/jed/2017.24.2.05>
21. Vidyakala K (2020) A study on the impact of green banking practices on bank's environmental performance with special reference to Coimbatore City. *Afr J Bus Econ Res* 15:1–6. <https://doi.org/10.31920/1750-4562/2020/09/20n3a21>
22. Xu H, Mei Q, Shahzad F, Liu S, Long X, Zhang J (2020) Untangling the impact of green finance on the enterprise green performance: a meta-analytic approach. *Sustainability*. 12. <https://doi.org/10.3390/su12219085>
23. Zhang X, Wang Z, Zhong X, Yang S, Siddik AB (2022) Do Green Banking Activities Improve the Banks' Environmental Performance? The Mediating Effect of Green Financing. *Sustain* 14:989. <https://doi.org/10.3390/su14020989>
24. Zheng G, Siddik AB, Masukujjaman M, Fatema N (2021a) Factors affecting the sustainability performance of financial institutions in Bangladesh: the role of green finance. *Sustainability* 13:165. <https://doi.org/10.3390/su131810165>
25. Zheng GW, Siddik AB, Masukujjaman M, Fatema N, Alam SS (2021b) Green finance development in Bangladesh: the role of private commercial banks (PCBs). *Sustainability* 13:795. <https://doi.org/10.3390/su13020795>
26. Zhou X, Tang X, Zhang R (2020) Impact of green finance on economic development and environmental quality: a study based on provincial panel data from China. *Environ Sci Pollut Res* 27:19915–19932. <https://doi.org/10.1007/s11356-020-08383-2>