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Green banking initiatives and sustainability: A comparative analysis between Bangladesh and India

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ABSTRACT

The study analyzes green banking practices, initiatives, and prospects in India and Bangladesh to examine how green finance can help in achieving the Sustainable Development Goals (SDG), particularly SDG 7′s goal for affordable and clean energy, and SDG 13′s goal for climate action. Using secondary data, the study performs a comparative analysis of the green banking practices and initiatives of the Bangladesh Bank (BB) and the State Bank of India (SBI). Green finance is crucial for sustainable development, addressing environmental challenges, and mitigating climate change by directing capital towards eco-friendly projects, and encouraging responsible banking and investments. The results show that SBI has adopted more green initiatives and invested more in green projects than BB. Both banks and their respective governments are dedicated to meeting SDGs 7 and 13 by providing more funds for green projects, supporting the clean energy transition, redesigning their banking practices, and developing new products aligned with green finance. Governments should create awareness about climate change and green banking practices, and strictly supervise these activities. Increasing the positive environmental impacts of banking is vital. For this, increased scrutiny of the environmental impact of funded projects and allocating additional funds for more ambitious environmentally friendly initiatives are necessary. Finally, a universally agreed-upon consensus on green practices remains elusive, suggesting that a more proactive regulatory role is needed.

Introduction

The escalation of extreme weather events in recent years has prompted concerns about the rise in climate risk (Weinhofer & Busch, 2013). The emphasis on promoting sustainability and eco-friendly banking practices with the aim of preserving the environment is unquestionable. Climate change and its impacts on the planet are of utmost concern globally (Rahman & Majumder, 2022; Kwakwa, 2023). Numerous researchers have issued alarming warnings regarding the severe consequences of climate change (Rahman et al., 2023; Voumik et al., 2023; Nahrin et al., 2023; Madaleno et al., 2022). The primary cause of climate change are rising greenhouse gas concentrations (Rahman & Majumder, 2022; Voumik et al., 2023); hence, reducing greenhouse gas emissions is imperative to mitigate the effects of climate

Abbreviations: BB, Bangladesh Bank; BCCSAP, Bangladesh Climate Change Strategy and Action Plan; BDP, Bangladesh Delta Plan; CCTF, Climate Change Trust Fund; CIB, Credit Information Bureau; CIBO, Credit Information Bureau Online; CRF, Climate Risk Fund; CSR, Corporate social responsibility; ESG, Environmental, social, and governance; ETP, Effluent treatment plant; GADP, Green Agriculture Development Projects; GCA, Green checking accounts; GCC, Green channel counter; GMA, Green money market accounts; GSA, Green savings accounts; GTF, Green Transformation Fund; HHK, Hybrid Hoffman Kiln; IDCOL, Infrastructure Development Company Limited; IGBC, Indian Green Building Council; LEEDI, Leadership in Energy and Environmental Design INDIA; MCPP, Mujib Climate Prosperity Plan; NDMP, National Disaster Management Policy; NDCIRM, Nationally Determined Contributions Implementation Road Map; NDC, Nationally Determined Contributions; NSIDM, National Strategy on Internal Displacement Management; NPDM, National Plan for Disaster Management; NSM, National Solar Mission; NMEEE, National Mission for Enhanced Energy Efficiency; NMSH, National Mission on Sustainable Habitat; NWM, National Water Mission; NMSKCC, National Mission on Strategic Knowledge for Climate Change; POS, point-of-sale; RRP, Resource Recycling Projects; SBI, State Bank of India; SOD, Standing Orders on Disaster; SREDA, Sustainable and Renewable Energy Development Authority; SATAT, Sustainable Alternative Towards Affordable Transportation.

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change on the planet and promote a sustainable environment. As one of the most vital cogs of society and the economy, the banking industry must play a more pivotal role in these efforts by encouraging stakeholders to undertake socially and environmentally responsible investments, thereby helping connect economic growth and environmental protection. Economic and monetary policies can significantly affect sustainability.

The concept of sustainability is normative, and dictates how humans should interact with their environment and hold themselves accountable for protecting it for future generations (Bekuma et al., 2023). The pursuit of sustainable development is essential for achieving desired future outcomes. This model focuses on promoting enduring cultural, socio-economic, and environmental well-being as its primary objective with a strong emphasis on long-term sustainability. The social, economic, and environmental aspects must be seamlessly integrated to achieve this goal (Mir & Bhat, 2022). The Brundtland Report of the UN World Commission on Environment and Development defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Given its substantial direct and indirect impacts on the preservation or destruction of a sustainable environment, the banking sector plays a crucial role in achieving a sustainable future.

The banking industry is often perceived as environmentally friendly; however, its carbon footprint has grown significantly because of its high energy usage, limited space, and haphazard construction. Banks can promote sustainability by adopting eco-friendly technologies, products, procedures, and strategies (Bhardwaj & Malhotra, 2013). As financial institutions, banks occupy a pivotal position in a country's economic landscape given their role as intermediaries between depositors and borrowers (Heffernan, 2005), and may also function as leaders in environmental change. To fulfill their dual duties, banks and other financial organizations should place greater emphasis on environmental protection not only for themselves but also for their stakeholders. Banks can promote morally upright and socially conscious banking, and encourage stakeholders to make substantial environmental contributions through corporate social responsibility (CSR) programs. Indeed, banks should align with sustainable banking, defined by the United Nations Environment Programme Finance Initiative (UNEP-FI) in 2007 as "the process by which banks consider the impact of their various operational activities, products, and services for meeting the needs of current and future generations."

To address the diverse needs of clients and customers in a rapidly evolving business landscape, and urgent need to reduce carbon emissions, banks are now considering the impact of financial services on environmental quality and the optimal utilization of natural resources. This has increased the acceptance of the concept of green banking, which encompasses the promotion of environmentally friendly practices to foster sustainable growth, and minimize the direct and indirect carbon footprints of the banking industry (Zhelyazkova & Kitanov, 2015). Indeed, the banking sector is increasingly embracing innovative green products, such as switching to online banking; utilizing electronic bill payment methods instead of postal mail; opting for environmentally friendly mortgages; choosing online banks for money market accounts, green credit cards, and certificate of deposits instead of conventional multi-branch banks; and seeking local institutions that actively support green initiatives (Gupta, 2015).

As a response to environmental challenges and increasing orientation of finance towards green investments, numerous businesses in the developed world have integrated environmental protection into their strategies, and offer eco-friendly goods and services to their clients. In developing countries, such as Bangladesh and India, environmental sustainability and resilience are critical components of inclusive socio-economic growth. In 2011, Bangladesh introduced green banking guidelines for all financial institutions in the country, which required them to implement environmentally friendly banking practices. Meanwhile, as responsible corporate citizens, the Indian banking industry is expected to assist the government in reducing carbon emissions. The potential environmental impact of banking stakeholders in India and Bangladesh, such as customers, in supporting the green transition is significant. In addition to the energy sector, industries such as steel, paper, concrete, fertilizers, chemicals, energy, textiles, and other high carbon-emitting industrial ventures rely primarily on bank financing (Muryani et al., 2023). The financial sector plays a significant role in the connecting economic growth and environmental conservation by fostering sustainable and ecologically conscious investments that support social welfare. As emerging industries experience rapid growth due to increased consumption and limited production capabilities, the financial sector's influence becomes increasingly crucial in navigating these challenges and promoting ecological responsibility.

This study examines the evolution of green banking practices, approaches, and regulations in Bangladesh and India, and evaluates the degree to which the financial sector contributes to the transition towards a more sustainable and environmentally friendly economy. The primary objectives are analyzing these countries' initiatives to achieve sustainability goals and compare green banking practices. Through this, this study seeks to understand the significance of green banking, its implementation, associated practices and projects, and how it contributes to achieving Sustainable Development Goals (SDGs), particularly SDGs 7 (affordable and clean energy) and 13 (climate action). The comparative analysis encompasses various aspects, such as green banking practices, initiatives, and alignment with the SDGs using secondary data from reputable financial institutions and relevant organizations' websites, including SBI, BB, UNDP, World Bank, UN, IRENA, IEA, ADB, EIB, and IFC.

A comparative analysis of Bangladesh and India, as key banking sectors in South Asia, is of utmost importance because of the potential effects on the region by influencing economic, social, environmental, and technological factors. As Bangladesh and India navigate the trade-off between environmental conservation and economic development, green banking initiatives have emerged as crucial tools for mitigating environmental damage and enhancing environmental quality through the accumulation of green funds and responsible activities. This study offers insights into the efficacy of green banking strategies in Bangladesh and India, which have hitherto been ignored by scholars. The state of financial development has critical implications for promoting growth and mitigating environmental degradation. Nevertheless, evidence on the influence of financial development in developing countries remains inconclusive, as noted by Raihan et al. (2023), Esquivias et al. (2023), and Khan et al. (2021).

The implementation of sustainable finance initiatives within the financial sector has the potential for realizing the favorable effects of sustainable finance and enable emerging countries to grow sustainably. Given the increasing importance of financing environmentally friendly projects (e.g., renewable and clean energy projects), minimizing environmentally-adverse investments, and achieving carbon neutrality by 2050, we need evidence on the role of finance in facilitating the green transition. This study's findings can provide valuable insights for policies and practices in the South Asian region, helping accelerate the achievement of the SDGs and in environmental protection.

Literature review

Green banking and sustainability

Clearly, creating practical strategies for implementing green finance and guiding regulatory agencies are of utmost importance for the creation of effective green banking guidelines and policies. Bukhari et al. (2020) proposed a set of optimal practices for green banking with a focus on environmental, social, and governance (ESG) aspects. This model is rooted in human ecology, and highlights the interdependence between ESG variables and the natural world. The authors discovered that green banking adoption can be achieved through either sequential or parallel

implementation, depending on both external and internal environmental factors. Mir and Bhat (2022) examined the practices of green banking, its adoption methods, and the significance of implementing green banking principles. The authors also explored the role and contributions of banks in promoting environmental sustainability and achieving the UN SDGs. Their findings unequivocally demonstrated the crucial role of financial institutions, particularly banks, in driving the development of low-carbon economies.

Several green finance studies examine the significance of constructing more efficient and resilient financial systems that promote sustainability. Chen et al. (2022) examined the influence of sustainable financing incentives on banks using data from 2011 to 2021. The authors found that an increase in green exposure positively affected the intermediation spread while concurrently reducing default risk. While the importance of sustainable banking practices in achieving carbon neutrality cannot be overstated, Sarma and Roy (2021) noted the scarcity of research on this topic. From 1995 to March 2019, only 178 articles from various fields addressed this issue. To address this research gap, the authors conducted a comprehensive scientometric analysis of sustainable banking literature, covering a wide range of aspects, including legal, modeling, stakeholder, green bank performance, and financial issues. The authors found scarce attention on sustainable banking continues.

Green banking and sustainability in Bangladesh

In the Bangladeshi context, several studies have examined the participation of banks and non-bank financial institutions (NBFIs) in facilitating the transition towards a more sustainable economy. Khairunnessa et al. (2021) comprehensively studied the progress of green banking in Bangladesh, with a particular focus on the critical role of financial regulations and regulators in promoting environmental sustainability within the financial sector. The authors highlighted the significant losses due to climate-related effects, and emphasized the need for immediate action to address climate change through adaptation and mitigation efforts. Similarly, Khatun et al. (2021) analyzed the adoption of green banking practices in Bangladesh from 2014 to 2019 and found that commercial banks successfully implemented environmentally friendly financing policies; however, state-owned commercial and specialized development banks displayed less inclination towards adopting green banking practices. These studies show the pressing need for new frameworks that can align bank operations with the SDGs to address the gap in effective green practices. For instance, Hoque et al. (2019) examined the annual reports and websites of both banks and NBFIs to understand how banks are adopting green practices. Uddin and Ahmmed (2018) explored the relationship between Islamic banking and green banking for sustainable development in Bangladesh. Using primary data, the authors found that Islamic banks in Bangladesh significantly contribute to the promotion of green banking through various means, such as cost and energy savings, resource preservation, and commitment to environmental protection. The researchers recommended that BB should make it compulsory for scheduled banks to offer green banking services to foster sustainable development.

Green banking and sustainability in India

Studies have examined different aspects of green banking in India to determine whether there is a link between environmental sustainability and bank performance. Sharma and Choubey (2022) explored how green banking affects brand image and trust. The authors studied strategies such as using environmentally friendly products, adopting sustainable internal processes, and improving CSR initiatives to make green finance more effective for the environment and economy. Bhardwaj and Malhotra (2013) conducted a case study analysis to examine the adoption of green banking practices, and found that these practices significantly affect organizational performance and advocated for the integration of environmental and enterprise performance metrics. Sahoo et al. (2016) examined the acceptance of green banking services and products by customers belonging to various age groups utilizing statistical ANOVA and post hoc tests. The authors observed a noteworthy variation in adoption, with the younger generation showing higher interest than older generations. The authors underscored the importance of a strategic approach to promoting green banking products, with a focus on specific customer segments, and emphasized the need to increase customer awareness about the benefits of green banking practices. Kumar et al. (2022) assessed the factors influencing the adoption of green banking practices using a sample of 161 banking officials working in commercial banks in the Delhi NCR area of India. The authors identified six significant factors, with factors related to regulatory compliance and environmental awareness being the most important. The financial industry indeed comprises a diverse range of products; as such, multiple factors can influence the effectiveness of environmentally friendly practices on bank performance (Akomea-Frimpong et al., 2022). This highlights the vast potential for the expansion of green finance, and the need for further research on this topic, particularly in India and Bangladesh.

Green banking initiatives in Asia

China's 13th Five Year Plan advocates for a green financial system, emphasizing green bonds to guide credit supply. The country excels in green credit, with banks supporting firms with robust green strategies. Fintech, exemplified by Ant Forest, integrates green finance by ensuring credit access, addressing information gaps, and fostering trust in farming communities. Green bonds, highlighted by Chen and Zhao (2021), play a pivotal role in unlocking finance for diverse environmental projects beyond renewables and sustainable buildings. China commands over 20 % of the global green bond market, ranking second to the United States. While the Emissions Trading Scheme initially covers power plants, China plans to expand to seven more sectors. Challenges persist, including simplifying regulations, increasing private involvement, and mandating larger proceeds for green projects (Muganyi et al., 2021; Chen & Zhao, 2021; IEA, 2020).

In Japan, the GX Plan focuses on green finance, driving investments in renewables, grid flexibility, energy efficiency, and the circular economy. The upcoming Japan GX bond aims to decarbonize sectors like iron and steel, chemicals, power, gas, oil, pulp and paper, and cement (Nomura, 2023). Indonesia issued a green sovereign bond to expedite its green transition (Climate Bonds Initiative, 2019). Singapore and Malaysia lead in the ASEAN region, with other players, including the Philippines, gaining traction in green loans (Climate Bonds Initiative, 2019). Malaysia introduced Green Sukuk to promote sustainable economic growth, emphasizing high-value activities in green technologies, such as green energies and buildings (Rozman & Azmi, 2022).

In the ASEAN region, governments are actively pursuing green initiatives (HSBC, 2023; Majekodunmi et al., 2023). Singapore leads the green finance market with initiatives like the ESG Impact Hub and Climate Data Catalogue (CBI, 2019). Malaysia expanded the SRI Sukuk and Bond Grant Scheme, while Thailand issued sustainability guidelines. Indonesia implemented a carbon tax and the Just Energy Transition Partnership. The Philippines introduced rules on sustainable investment, and Vietnam prioritizes green bonds for water projects (CBI, 2019). Additionally, Malaysia and Thailand witnessed robust green bond markets, with TMB Bank issuing Thailand's first green bond in 2018 (CBI, 2019). Indonesia's varied green finance initiatives include a USD500m sustainability bond in 2019 and plans for carbon trading mechanisms (Transition et al., 2023).

Green banking

Green banking, first introduced in 2003, is a commitment to both economic growth and environmental protection (Lalon, 2015). Green

banking aims to provide banking products and services in a manner that minimizes the direct and indirect negative impacts on the environment while concurrently improving the efficiency and effectiveness of resource utilization, with the goal of fostering a more prosperous, equitable, and sustainable world (De Silva, 2019). This type of banking encompasses various environmentally conscious services, such as eco-friendly mortgages, sustainable loans, green savings accounts (GSA), green checking accounts (GCA), Green money market accounts (GMA), green agriculture development projects (GADP), mobile banking (m-banking), online banking, remote deposit services, eco-friendly credit cards, waste management solutions, roof gardening initiatives, and environmentally responsible financing methods (Islam & Das, 2013).

Some international examples of green banking initiatives

Several Asian banks have embarked on green banking initiatives. In 2011, Malaysia's MayBank launched several environmentally sustainable banking initiatives. One such initiative was the philanthropic contribution of RM 1 million towards research aimed at preserving the natural habitats of indigenous tiger species in Malaysia. The bank also participated in the Carbon Disclosure Project (CDP), a non-profit organization that evaluates how firms handle climate change issues. Furthermore, MayBank made a financial contribution of RM 70 million towards the Sun Lease program, which aims to install 30 MW of rooftop solar power systems to increase access to cost-effective electricity (MayBank Sustainability Report, 2021; Mir & Bhat, 2022). Bank Mandiri has allocated a total of $41.3 million to eight regional cassava starch producers in Indonesia to help develop a biogas power generation system. The utilization of wastewater treatment in cassava starch production companies has the potential to generate approximately 23.6 MW of electricity and significantly reduce carbon dioxide emissions by up to 543 thousand tons annually (Risal & Joshi, 2018).

The UK Green Investment Bank, in collaboration with the Marubeni Corporation of Japan, acquired 50 % ownership interest in the Westermost Rough offshore wind farm from DONG Energy. The transaction involved a financial commitment of £241 million. The project utilized Siemens' advanced 6 MW direct-drive turbines, resulting in the production of over 800 GWh of net renewable electricity. Furthermore, the Bank agreed to purchase 10 % ownership interest in the Gwynt y Môr offshore wind farm, which is recognized as the largest in Europe. This acquisition was made by RWE Innogy for a total consideration of £220 million (Infrapppworld, 2014).

Challenges of green banking initiatives

Challenges regarding green banking in Bangladesh

Although the concept of green banking was introduced in Bangladesh in 2011, it remains in the early stages of development. In recent years, the development and implementation of green bonds and financing has remarkably increased, demonstrating their viability, feasibility, and potential for expansion. Bangladesh faces significant internal challenges in this industry which hinder its progress. Further, there is an ongoing debate regarding green products, which has resulted in the diversion of attention from conventional banking products. Challenges in green finance can be broadly divided into several categories (Ashiq & Shahir, 2019).

i. Lack of expertise and inadequate endeavors to enhance the capacity of financial institutions and stakeholders in green banking.
ii. Commercial banks have been unable to fulfill their objective of allocating 5 % of their total loan portfolios towards direct green financing.
iii. Absence of clearly delineated environmental standards.
iv. Inadequate rewards for beneficial impacts and insufficient penalties for negative consequences.
v. Lack of efficient coordination among pertinent agencies, and medium- and small-scale factories exhibit reluctance to adopt green-banking practices.
vi. The implementation of the green industry is now experiencing setbacks, resulting in a lack of timely relocation for industries categorized as "Red."
vii. The present level of understanding of global climate financing systems is inadequate, thereby hindering the effective procurement of funds.
viii. The shortage of competent in-house resources to formulate comprehensive project plans has further escalated the intricacy of the process.
ix. Inability to manage financial resources effectively and successfully complete projects within the prescribed timeframe.
x. Delays in submitting applications for climate funding are primarily attributable to procrastination, which negatively affects the overall process.
xi. The prolonged realization of expected earnings is attributed to the operational and market risks associated with green projects.
xii. The implementation of green initiatives often incurs substantial transaction costs that can lead to delayed financial returns and difficulties in acquiring funding, particularly for projects with substantial initial expenditures.
xiii. Failure to effectively manage emerging green technologies in Bangladesh has led to the inefficient handling of environmental initiatives.
xiv. The inefficient implementation of green marketing practices and persistence of non-performing loans have resulted in heightened financial risk.
xv. The scarcity of environmental disclosures by financial institutions and firms is a challenge for green investors, as it leads to elevated costs associated with carrying out comprehensive research.
xvi. The limited availability of environment-friendly products to the general public presents additional challenges for the growth of green financing initiatives.

Challenges regarding green banking in India

The major challenges facing green banking activities in India are as follows (Giridhar & Sudhakar, 2017):

i. The limited diversification of banks' customer base.
ii. Strict green banking standards often limit business dealings to firms that meet these standards, resulting in a smaller pool of eligible clients and hindering their growth potential.
iii. Several green banks in India are in initial stages of development. Typically, the process of achieving profitability for a bank requires several years, which can lead to challenges during economic downturns or recessions.
iv. Having a highly skilled and knowledgeable team in green banking is imperative to provide specialized services. However, this leads to elevated operating costs, resulting in increased operational expenditures.
v. Hiring experienced loan officers with expertise in serving environmentally focused businesses and clients remains an obstacle to expanding green banking.
vi. Participating in green finance initiatives carries the risk of environmental hazards and requires powerful tools for risk assessment.
vii. Providing loans to businesses affected by environmental factors, including pollution and changing regulations, leads to heightened credit risk.
viii. Green banks' foremost goal is to promote environmental responsibility through funding initiatives that may not necessarily generate profits, thereby compromising their long-term financial stability.

ix. Strict commercial regulations imposed by the government have limited the diversification of financial products and increased administrative work.

Major green banking initiatives by BB

Green finance and climate risk fund

Green finance is a blend of direct and indirect financing. Direct financing sources include banks' personal funds and BB's funds for environment-friendly and green energy projects. Indirect financing covers projects that use effluent treatment plants (ETP). Green financing mainly supports sectors such as waste management, material reuse and recycling, green brick production, green buildings, alternative energy, renewable energy, and energy efficiency. Commercial banks, following BB's instructions, have adopted green initiatives to promote environmental sustainability by providing minimum interest credits for clients who install solar equipment, ETPs, biogas plants, and hybrid Hoffman kilns (HHK), among other sustainable projects (Rahman & Majumder, 2022).

In 2012, banks invested BDT 20,034.59 million in projects that promote green and sustainable practices as part of green finance initiatives (Islam & Das, 2013). However, climate risk is a significant concern. To mitigate and safeguard against such hazards, banks use the Climate Risk Fund (CRF) as a preventive tool (Faruque et al., 2016). Global and international agencies such as the World Bank, ADB, and the UN have also supported the CRF (Rahman & Majumder, 2022). Moreover, the CRF has been used to allocate funds for CSR activities related to climate change risk. In 2012, banks allocated BDT 23,018.36 million from their CRF (Zhixia et al., 2018) for the first time.

Refinance scheme and green transformation fund

In 2012, the BB disbursed BDT 838.4 million out of the BDT 2.0 billion revolving fund as a refinance scheme for the promotion of green projects, including solar water pumps, solar energy systems, natural gas plants, ETP, HHK, and solar photovoltaic module assembling plants (Islam & Das, 2013). In 2016, the Green Transformation Fund (GTF) was announced, with a provision for a participation agreement to be executed between BB and interested banks to strengthen the financing structure under GTF. Since 2019, the GTF has been made available to all manufacturer exporters against the import of capital equipment, and to support the implementation of specific environmental or green projects (Ullah, 2020).

Mobile banking

Mobile banking systems provide efficient and cost-effective banking services to underserved populations (Aubhi, 2016). BB endorsed this system because of its potential to conserve paper (Hossain et al., 2016). M-banking allows for easy bill payments, money transfers, and balance inquiries, thereby saving time and energy for customers. Furthermore, this banking system has significantly reduced the use of power, paper, and energy by banks. Indeed, many institutions have attempted to implement this paperless facility (Ullah, 2013).

Online banking, SMS banking, and ATMs service

Several banks have implemented various technologies to offer paperless banking services, such as online banking, SMS banking, credit and debit cards, call centers, e-payment gateways, virtual cards, and e-payment facilities. As part of their green banking initiatives, several banks are now focusing on their corporate credit functions and collaborating with non-financial institutions, such as NGOs, to reduce paper usage and enhance efficiency (Ullah, 2020). Most private and public banks provide 24/7 banking services through their nationwide network of ATM booths, with 10,924 operational booths in Bangladesh as of July 2023 (The Financial Express, 2020).

Green bonds

A green bond is a type of long-term security that aims to finance or refinance projects that generate a positive and quantifiable impact on the environment besides financial returns (BB, 2022). These bonds serve as dedicated products for raising funds for eco-friendly projects and cater to various sectors such as transport, buildings, energy, industry, water, waste, agriculture, and forestry. Issuing green bonds can expand Bangladesh's bond market, and attract new institutional and international investors interested in supporting sustainable development. According to the IFC (2019), Bangladesh could receive up to $172 billion in climate-smart investments from 2018 to 2030 primarily in green buildings, transport systems, urban water, agriculture, waste management, and renewable energy to meet its Nationally Determined Contribution (NDC) goals. To help Bangladesh achieve these goals, the IFC has been assisting BB in creating and enforcing regulations that encourage financial institutions and banks to manage social and environmental risks, and promote green lending.

Green energy projects

To combat the impacts of climate change, policymakers globally are instituting more stringent renewable energy targets and allocating significant funds to support the transition. While fossil fuel energy consumption in India increased by nearly 11 % in 2022, the country's overall energy demand is projected to grow in the future. As emerging nations seek to improve their energy production, distribution, and consumption efficiencies in response to rising energy prices, additional funding is required for new energy projects. Indeed, emerging nations are increasingly turning to alternative energy sources, such as wind and solar photovoltaic. According to Rystad Energy, the global capital expenditure on these assets has grown from nearly $350 billion in 2021 to almost $500 billion in 2022, surpassing investments in oil and gas wells.

Simultaneously, major economies are providing substantial incentives for clean energy initiatives, such as America's Inflation Reduction Act (IRA), initiatives by the European Commission, and China's efforts, which are increasing subsidies for clean-tech companies and raising targets for installed renewable capacity, especially in solar. In India, the private sector is spearheading green initiatives, with a nearly 50 times increase in installed solar power. Private firms are pledging investments of approximately $190 billion in the coming years. While the Indian government aims to triple renewable energy capacity by 2030 and has introduced guarantee mechanisms, India's green surge faces challenges, particularly in financing. Experts estimate that achieving the increase in three folds of clean energy by 2030 will require over $500 billion in green investment, double the current investment pledges of major firms, necessitating the need to attract new sources of capital.

Green banking initiatives by SBI

Windmill installation

SBI set a notable example by being the first bank in India to generate green energy by installing 10 windmills with a capacity of 15 MW in several states, including Gujarat, Tamil Nadu, and Maharashtra. The installation of a 1.5 MW windmill costs approximately INR 100 million, but its operational cost is almost free, making it a cost-effective solution. Suzlon Energy has been entrusted with installing these windmills, acting as an example to encourage Indian banks to adopt environmentally friendly practices Indeed, the bank is trying to provide cheaper interest financing for such initiatives under the "Carbon Credit Plus" scheme

(Kaur & Sandhu, 2019).

Green housing

SBI has launched a green housing initiative to promote a carbon–neutral society. The bank is currently offering loans to support the development and implementation of green projects, such as buildings, which reduce their environmental impact through operational improvements. Organizations in India that recognize green structures include Indian Green Building Council (IGBC), Leadership in Energy and Environmental Design (LEEDI), TERIGRIHA, and the Energy and Resources Institute - Business Council for Sustainable Development (TERI-BCSD). SBI has introduced a new product called the "SBI Green Home Loan," which offers a margin concession of 5 %, a fixed interest rate of 0.25 %, and no processing fee for green homes (Masukujjaman, 2013). This initiative demonstrates SBI's commitment to promoting sustainable development and reducing the negative impact of human activities on the environment.

Financing for rooftop solar project

SBI has demonstrated leadership in promoting environmental sustainability by offering loans to finance rooftop solar panel installations. The program, which has received support from the World Bank, will enable the installation of solar panels with a total capacity of 100 MW, valued at INR 4 billion. This initiative is expected to significantly contribute to the reduction of carbon emissions and support the country's renewable energy goals (Kaur & Sandhu, 2019; Singh & Zaheer, 2023).

Green channel counter system

In 2010, the SBI undertook an initiative to shift from a paper-based banking system to a green channel counter (GCC) system, which was implemented in multiple branches. The GCC system replaces pay-in slips and checks with point-of-sale (POS) machines for card swipes and paperless transactions, thereby promoting green banking (Neeraja & Joseph, 2021; The Hindu, 2011; Yadav & Pathak, 2013). This initiative resulted in the daily processing of millions of transactions. The use of paper in the banking industry generates a significant amount of waste, requires the cutting of more trees, and ultimately, leads to environmental degradation. Therefore, the implementation of GCC has been an essential initiative for the bank, as it helps conserve resources and mitigate environmental damage (Kaur & Sandhu, 2019).

Green bond and green financing

SBI introduced green bonds to provide funding for environmentally friendly initiatives (Das et al., 2023). The evaluation and approval of green-bond projects are conducted in accordance with bank guidelines and the delegation of sanctioning powers. These projects undergo due diligence and funds are allocated for projects involving green energy, carbon-free structures, power-intensive industrial structures, waste management and contamination control, and environmentally friendly transportation. Only projects approved by competent authorities are considered for the allocation of green-bond proceeds (India CSR Network, 2018).

Green marathon

SBI has introduced the concept of holding annual marathons to promote environmental sustainability (India CSR Network, 2018). In 2017, SBI organized the Green Marathon, which attracted approximately 250,000 participants under the theme "Run for Green" to promote a greener world. The events were conducted in five cities, including Delhi, Bangalore, Chennai, Ahmedabad, and Chandigarh. The participants received saplings to support the campaign for clean cities, and bibs with seeds for planting were provided after the marathons. SBI also used biodegradable and recyclable materials during the event. The bank's Deputy Managing Director (Human Resources) and Chief Digital Officer emphasized SBI's commitment to integrated sustainability and environmental protection. Initiatives such as these raise awareness of the importance of a safe environment for healthy living Das et al., 2023).

Online and mobile banking

SBI is a prominent player in m-banking in India, with a focus on enhancing financial literacy and contributing to the overall strength of the economy. With a vast network of branches, SBI offers various m-banking services through various apps, such as SBI Quick, Samadhan, mCash, OTP Secure, Exclusif, Digivoucher, NoQueue, and State Bank Buddy. Customers can access these services through various channels, including applications/WAPs, SMS, and USSD. The widespread availability of SBI's m-banking services has greatly simplified financial tasks for customers, allowing them to carry out banking activities from the comfort of their homes (Devi, 2018).

Solar ATMs

SBI has taken proactive measures to reduce the direct impacts of its operations on the environment. Besides implementing recycling programs and energy-saving practices at its corporate headquarters and branches (Mittal et al., 2023), the bank has employed a significant number of solar-powered ATMs in India. This initiative has helped reduce 2000 tons of its annual carbon dioxide emissions. To further decrease carbon emissions and environmental impacts, the bank constructed 250 ATMs and 150 buildings with solar panels in September 2018. Moreover, SBI has adopted automated systems, energy-saving lighting, and effective time management to minimize its impact on the environment (Kaur & Sandhu, 2019).

Electronic annual report

Electronically transmitted annual reports (eAR) also symbolize SBI's drive towards paperless or electronic reporting as an alternative to traditional paper-based annual reports. The shift towards eAR was initiated in response to the substantial amount of paper waste generated by the conventional sending of annual statements. This initiative was prompted by shareholders and supported by a small fee, which was donated to charity. In 2014, the bank raised INR 30.9 million by collecting INR 100 for each eAR, which was subsequently donated to the Welfare Fund of SBI Children (Kaur & Sandhu, 2019).

Participation in CDP

CDP facilitates environmental disclosure, enabling businesses and organizations to measure, manage, and report their environmental impacts, including carbon emissions and data related to climate change. In 2011, SBI joined CDP as a signatory, along with 550 other institutions, to commit itself to reducing carbon emissions and promoting sustainable banking practices (Tara & Singh, 2014; Vadrale & Katti, 2016).

Comparison of green banking initiatives between BB and SBI

The comparison of green finance initiatives between SBI and BB shows distinct approaches and noteworthy achievements (Table 1). SBI allocated a substantial sum of INR 319.18 billion ($4.26 billion) towards green power projects in the year 2021, following the financing of INR 4 billion for solar roof panels. As of March 31, 2021, the bank has supported 752 green power projects (MERCOM, 2021). To encourage digital channel customers, SBI offers green reward points that can be redeemed for loans to the SBI Green Fund. The fund supports sustainable

Table 1
Comparative Green Banking Initiatives. Source: Authors' self-assessment.

Items	SBI	BB
Green Fund and Green Finance	i) As of March 31, 2023, over 23.9 million + green fund reward points have been redeemed.ii) SBI allocated INR 4 billion for solar roof panels and received approval for INR 319.18 billion ($4.26 billion) in 2021 for renewable energy projects. iii) As of March 31, 2021, SBI had financed a total of 752 renewable energy projects.	i) In 2011, BB installed an 8-kilowatt solar power system on its rooftop with the aim of motivating commercial banks to engage in green banking practices. ii) In the year 2022, BB disbursed a total of BDT 73.40 billion in green finance, while NBFIs disbursed BDT 9.96 billion.
Green Bond	i) SBI raised $650 million from green bonds in 2018. ii) SBI issued green bonds worth $800 and $100 million in 2019 and 2020, respectively. iii) It plans to raise around $500 million through green bonds in 2023.	Green bonds worth BDT 1.0 and BDT 30.0 billion green bonds had been issued by two individual companies in 2016 and 2021, respectively. In 2022, BB published a green bond policy.
ATMs and Automated Deposit and Withdrawal Machines (ADWMs)	On March 31, 2023, the bank publicly released information regarding the respective numbers of ATMs and ADWMs, which were 65,627 and 12,608, respectively.	On June 30, 2022, the total number of ATMs in Bangladesh stood at 13,036.
GTF	Not found under review	The bank launched a BDT 50 billion GTF
GCC	Deployed 33,077 GCC terminals at 21,446 retail branches	Not found under review
Green Awareness	Programs and campaigns through posters, banners, e-bulletins, marathon etc.	Two programs organized: i) Smart Bangladesh Smart Haatii) Programme to Support Safety Retrofits and Environmental Upgrades in the Bangladeshi RMG Sector (SREUP)
Technological Adaptation	200 solar-powered ATM and 250 ATM with solar panels covering the roofs of 150 building	Solar ATM, E-Banking, advanced machineries, and others
Student-centric Initiative	During FY23, 1,13,793 students received education loans worth 15,086 crores, with 41 % of them being provided to females. According to the annual report, SBI held a 33.18 % market share in education loans and the growth rate was 21.9 %.	In June 2022, there were 3,218,193 student accounts under school banking initiatives, with BDT 23,390.90 million in deposits. The number of accounts and amount of deposits increased by 241,550 (8.11 %) and BDT 1,912.8 million (8.91 %), respectively, as compared to June 2021.
Paperless Banking	Retail and digital banking development initiatives, such as digital banking applications, phone banking, and e-annual reports, have been implemented.	The bank announced the initiation of digital banking, m-banking, and an electronic annual report, among other digital services, to be its primary focus.
Project on Carbon Disclosure	SBI is the signatory of CDP	Raise fund and social awareness
Environment Diversity	SBI adopts 15 tigers per year since 2011	Raise fund and social awareness
Green Transportation Loan	i) The bank's green car loan scheme aims to promote cleaner mobility by providing a longer prepayment period of up to eight times and a concession of 20 base points (bps) on the interest rate compared to a regular car loan.ii) To promote the use of cleaner energy and to ensure a boost in environmentally friendly practices, SBI has sanctioned ₹120.6 million towards the E-rickshaw scheme.	Several banks in the country have launched initiatives for green transport loans.

activities; since its establishment in October 2019, over 239 lakh reward points have been redeemed as contributions to the fund by March 31, 2023. Furthermore, SBI has invested significant amounts in solar, small hydro, and wind power projects. Meanwhile, in 2011, BB implemented an 8-kilowatt solar power system on its rooftop to encourage other commercial banks to adopt green banking practices (Khairunnessa et al., 2021). In the 2022 annual report, banks provided BDT 73.40 billion and NBFIs provided BDT 9.96 billion for green finance disbursements. The green finance percentage against the total term loan disbursement was 3.52 % (BB, 2022).

Notably, by the end of March 2023, SBI had one of the largest ATM networks in India, comprising 65,627 ATMs, which included 12,608 Automated Deposit and Withdrawal Machines (ADWMs). The bank's domestic market share for installed ATMs and ADWMs was approximately 30 %, and it handled the highest share of cash dispensation (34 % in India). On average, more than 1.32 crore transactions are processed daily (SBI, 2023). Recently, BB organized a program on awareness, titled "Programme to Support Safety Retrofits and Environmental Upgrades in the Bangladeshi RMG Sector," to increase the Ready-Made Garment (RMG) sector's ability to maintain itself with a €50 million loan facility (The Business Standard, 2023). Furthermore, the bank issued green bonds worth $800 million in 2019 and $100 million in 2020 (KPMG India, 2017).

Meanwhile, SBI intends to raise $500 million through green bonds in 2023 with the aim of providing renewable financing for projects (SBI, 2023). The major investors in this agreement are Amundi, AXAIM, and NNIP (Azizuddin, 2023). Bangladesh has also issued two green bonds, with the Sajid Foundation issuing a bond worth BDT 1.0 billion in 2021, and Beximco Green-Sukuk Al Istisna issuing a bond worth BDT 30.0 billion in 2016. These bonds aim to improve microcredit outreach and environmental development, as well as fund solar power plants and textile expansion (The Finance Express, 2023). In 2022, BB published a policy to enhance the efficiency of green-bond financing, with objectives including climate change reduction and adaptation, as well as transitioning to a circular economy (BB, 2022).

BB and SBI have also taken initiatives to promote environmentally friendly practices and sustainable development in their respective countries. BB established the GTF, a BDT 50 billion refinance fund, to accelerate these efforts (Dhaka Tribune, 2023). Unfortunately, no information regarding GTF was found for SBI. However, SBI must also take the initiative to adopt GTF to promote green practices in India. SBI has installed 33,077 GCC units in 21,446 retail branches to promote green banking practices (Mir & Bhat, 2022). Although GCC information has not been found for BB, it should also adopt GCC to promote green banking. Both banks have commendably implemented paper-free banking systems.

SBI has made significant strides towards promoting green banking practices. The bank has installed 1200 solar-powered ATMs and 250 ATMs with solar panel-covered roofs on 150 buildings. However, there are not sufficient solar-powered ATMs by BB. BB should construct more

solar-powered ATMs to conserve energy and reduce carbon dioxide emissions. Moreover, SBI is a signatory to CDP, whereas BB is not. BB should take advantage of CDP membership immediately to work for the planet and its people. SBI is also adopting 15 tigers each year to maintain ecological balance. In contrast, BB did not undertaken enough environmental diversity initiatives. It should adopt similar initiatives as soon as possible to save animal species. Finally, SBI provides loans for green cars and e-rickshaws to help reduce CO_2 emissions and fossil fuel consumption (SBI, 2023). While it is commendable that BB also provided loans for renewable energy projects, it could expand its portfolio of green loan products to further encourage sustainable development.

SDGs and green banking initiatives

The 2030 Agenda serves as a visionary blueprint, promising the implementation of groundbreaking policies to steer the world towards progressive, environmentally friendly, and versatile development. Launched by the UN in 2015, this agenda centers around the 17 SDGs, aiming to eradicate poverty, address inequality, combat climate change, prevent environmental degradation, and safeguard the planet by 2030 (UN, 2023). These interconnected goals were endorsed by nations at the United Nations Summit on Sustainable Development, Agenda 2020, symbolizing a collective commitment to advancing global efforts for environmentally sustainable development (Zheng et al., 2021; Streimikis & Baležentis, 2020).

Comprising 169 targets and 232 indicators, the SDGs build upon the six proposed Millennium Development Goals (Evans & Steven, 2012. The UN established an Open Working Group to propel the SDGs forward, following the mandate of the "The Future We Want" Conference Outcome Document. The UN Statistical Commission suggested that a group of indicative factors should be developed by September 2015, leading to its final approval in the Commission's 47th session in 2016. The universality of these 17 goals emphasizes the need to achieve them globally, transcending the boundaries of underdeveloped and developed countries. This universal approach calls for collaboration at the local, national, and global levels, especially in aligning SDGs with local objectives, which is a critical consideration in the diverse contexts of Asia and the Pacific. In 2017, the ADB emphasized that developing Asia must invest approximately $1.7 trillion annually until 2030 in transportation to sustain growth, combat hunger, and address climate change. Green investments in transportation, energy, information technology, water distribution, sanitation, and urban renewal are crucial for sustainable development in these regions (UN, 2023; Lee, 2020).

Central to the 2030 Agenda is the principle of "leaving no one behind," necessitating a focus on societal inclusivity. To achieve the SDGs, the Agenda calls for targets, progress on enabling factors, creativity, technology, resource mobilization, and time-bound commitments. This study highlights the interrelation of two crucial goals, SDGs 7 and 13, with green banking in India and Bangladesh, offering a deeper exploration of their significance (UNDP, 2015).

SDG 7 (affordable and clean energy)

SDG 7 is pivotal in addressing the multifaceted challenges confronting society, the economy, and the environment. Its primary focus is on "affordable and clean energy," with a mission to ensure universal access to modern, affordable, dependable, and sustainable energy (IEA, 2023; IRENA, 2023. Emphasizing the significance of renewable energy sources, energy efficiency, and electricity access, SDG 7 aligns with the broader objectives of poverty eradication, economic development, and climate change mitigation.

However, the World Bank has noted challenges in achieving SDG 7 targets. In 2021, 675 million people lacked access to energy, and 2.3 billion, primarily in Sub-Saharan Africa and Asia, lacked access to clean cooking facilities. Projections for 2030 still anticipate 660 million people without electricity access and 1.9 billion relying on unclean cooking fuels. The power industry has witnessed substantial growth in green power deployment, with a remarkable 27 % increase from 2010 to 2020 and 7 % increase from 2019 to 2020, the highest annual growth in the last three decades. Despite global renewable energy consumption reaching 19.1 % in 2020 (up from 16.7 % in 2010), further acceleration is imperative, particularly in the heat and transportation sectors.

Highlighting this urgency, energy-efficient deployment must be intensified, with a targeted annual improvement of 3.4 % by 2030. However, global public funding to poorer nations saw a remarkable 40 % decline in 2021. Moreover, international public financial transfers for renewable energy assistance to developing countries fell for the third consecutive year, amounting to $10.8 billion—only 40 % of the 2017 peak at $26.4 billion (IRENA, 2023). This underscores the need for renewed commitment and increased financial support to propel progress towards achieving SDG 7.

Bangladesh' efforts towards achieving SDG 7

To advance SDGs, various organizations have implemented impactful initiatives in Bangladesh. The Sustainable and Renewable Energy Development Authority (SREDA), established in 2021, has spearheaded initiatives such as home electrification, mini-grid placement, wind turbines, biogas plants, and tidal area exploration (SREDA, 2021). SREDA's overarching objective is to foster sustainable fuel development and environmentally friendly fuels by reducing the reliance on fossil fuels, promoting renewable fuels, and exploring new sustainable alternatives. The agency employs a multi-layered approach that encompasses policy formulation, regulatory frameworks, business models, funding accessibility, skilled consultancy, and experimental technologies. Meanwhile, government financial institutions contribute to the expansion of financing for renewable energy projects (Munjer et al., 2023).

Bangladesh has witnessed remarkable progress towards the goal of achieving 100 % electricity through solar home system projects by 2021. The Infrastructure Development Company Limited (IDCOL) program, growing at 60 % annually, has successfully deployed five million renewable energy systems among its 13 million subscribers. The solar home systems sector aims to reach a capacity of 220 MW, with plans to further enhance the rooftop solar energy capacity to 300 MW by 2022 (SREDA, 2021; Munjer et al., 2023). The deployment of mini-grid solar power, catering to a range of capacities from 100 kW to 5 MW, has seen 11 IDCOL-funded small-scale grids installed in rural areas, with another 15 in progress (Munjer et al., 2023).

Bangladesh also has ambitious plans for wind power generation; a target capacity of 1360 MW by 2021 had been outlined. The Wind Resource Mapping Project, completed in 2016, collected wind flow data from nine regions, with specific projects planned at Inani Beach and Mongla (Uddin & Ahmmed, 2018; Rahman & Majumder, 2022; Munjer et al., 2023). The country's robust biogas sector, boasting over 53,200 plants, generates both gas and electricity, with the byproduct serving as compost. Private entities, including Grameen Shakti, have contributed significantly to the growth of this industry. Tidal power generation, particularly viable in the eastern delta regions such as Cox's Bazar and Sandwip, has the potential of an annual generation capacity of 2.23 GW-hours. The government's introduction of net-metering regulations in 2017 further supported the growth of green energy by reducing installation costs for industrial power plants and lowering the overall cost of renewable electricity (Munjer et al., 2023). This concerted effort in Bangladesh reflects a substantial commitment to achieve sustainable and renewable energy targets aligned with the SDGs.

India's efforts towards achieving SDG 7

Several Indian public and private organizations are actively contributing to the pursuit of SDG 7 by undertaking notable initiatives in the power and energy sectors. Although numerous projects are underway, three significant ones are highlighted here (UN, 2023.

The first project, Pradhan Mantri Ujjwala Yojana (PMUY) 1.0, commenced in 2016 with the objective of providing LPG connections without deposits to individuals below the poverty line. By March 2018, the target was increased to 80 million LPG affiliations, and was achieved by August 2019. Another project is the Deen Dayal Upadhyay Gram Jyoti Yojna project, aimed at electrifying 18,000 villages over 987 days, has been instrumental in rural electrification. The Indian government plans to invest INR 756 billion in this initiative. Another impactful program, Saubhagya, successfully provided energy to 2,828 million homes in less than 18 months, resulting in a substantial reduction in kerosene use from 892 billion liters in 2014–15 to 204 billion liters in 2020–21. This decrease has contributed to a 77 % reduction in kerosene dependence and an annual reduction of 17.2 million metric tons of CO2 emissions.

The second project focuses on positioning India as a global hub for green hydrogen production and export. Initiated by the Prime Minister and led by the Ministry of New and Renewable Energy, this effort seeks to enhance green hydrogen production and utilization across various sectors. By investing in green hydrogen technologies, the project aims to reduce the country's reliance on imported fossil fuels and promote the decarbonization of the economy.

The third project, Sustainable Alternatives to Affordable Transportation (SATAT), targets the production of 15 million metric tons (MMT) of compressed biogas (CBG) by the end of 2024. Established in October 2018, SATAT contributes to effective waste management by utilizing organic waste, including municipal garbage, forestry by-products, agri-waste, and marine waste. These initiatives collectively showcase India's commitment to sustainable energy practices and its strides towards achieving SDG 7.

SDG 13 (Climate Action)

Climate change, which is characterized by a gradual increase in global temperatures and shifting climate patterns, can be predominantly attributed to human activities. The primary contributors to climate change is the combustion of fossil fuels, such as coal, oil, and gas, resulting in the emission of greenhouse gases, such as CO_2 and N_2O. Scientists estimate that the average global temperature has risen by 1.1 °C since the industrial revolution, leading to severe consequences such as devastating fires, water shortages, extreme droughts, rising sea levels, floods, polar ice melting, intense storms, and biodiversity decline. These climatic shifts have affected various aspects of human life, including health, agriculture, living conditions, safety, and employment (UN, 2023. The economic toll of climate change is substantial, with the UNDP noting costs in the hundreds of billions of dollars. Geophysical disasters linked to climate change have resulted in significant human casualties, with 1.3 million accidental deaths and 4.4 billion injuries recorded between 1998 and 2017, accounting for 91 % of such incidents (UNDP, 2015).

Moreover, the World Bank predicts that by 2050, more than 50 million people may be compelled to seek asylum outside their home countries to avoid the most severe impacts of climate change (World Bank, 2021). The urgency to address climate change is underscored by its multifaceted consequences, emphasizing the need for global cooperation and sustainable practices to mitigate further damage, and safeguard the well-being of both the planet and its inhabitants.

Bangladesh's efforts towards achieving SDG 13

Bangladesh is one of the most climate-vulnerable nations globally, and is grappling with the impacts of climate change and other natural factors. In response, the country's Prime Minister initiated the "Bangladesh Climate Change Strategy and Action Plan 2009″, marking a significant step as the first developing nation to adopt such a comprehensive strategy. To operationalize the BCCSAP 2009, the "Climate Change Trust Fund" (CCTF) was established in 2009–2010 utilizing the government's revenue budget. The CCTF aims to enhance local communities' resilience to climate change hazards, and facilitate the development and dissemination of climate-resistant innovations (BCCT, 2021).

Complementing these efforts, Bangladesh has implemented key national policies, including the APA, NDC, EU, NDC Implementation Road Map (NDCIRM), MCPP, NDMP, SOD, PAISFDRR 2015–2030, NSIDM, NPDM, BEECMP, BNAP, and BDP, aligned with the goal of mitigating climate change to achieve SDG 13 (MOEF, 2022). BB has further played a role by introducing the "Sustainable Finance Policy for Banks and Financial Institutions," offering low-interest credit (2–4 %) to incentivize financial institutions to increase lending for green initiatives.

Collaborating with international partners, the Bangladeshi government and World Bank also signed finance agreements totaling $858 million. These funds are earmarked for supporting food production, climate-resilient agricultural development, and transportation security initiatives.

India's efforts towards achieving SDG 13

Indian organizations have undertaken several efforts for climate action. As a responsible organization, SBI has also taken steps to contribute to India's commitment to achieving the UN's 2030 objective for sustainable development. The bank has developed various goods and services for this, including financing solar photovoltaic pump sets, financing playhouses, providing green car credit, supporting the e-rickshaw scheme, and financing grid-connected rooftop renewable-energy PV plants. These initiatives aim to promote sustainable practices and support India's efforts to combat climate change. SBI has invested Rs 397 billion ($5 billion) in these initiatives, making it one of the largest domestic lenders in the green power sector.

The bank recognizes the importance of funding sustainable businesses and practices as powerful tools for managing ESG risks effectively (Srivastava, 2022). SBI has also agreed to support the Neev Fund II, a €100 million private equity fund for sustainable development and climate change mitigation. This fund will allocate this amount to Indian small and medium-sized enterprises, with a focus on strategies essential to achieving global climate action. The project also supports clean energy, electric vehicles, water, and circular economy projects (SBI, 2023). India has committed to achieving 40 % non-fossil fuel energy and generating 450 GW from renewable sources by 2030, as outlined in its Intended NDC. This underscores India's dedication to combating climate change and fostering sustainable energy practices at scale. To pursue climate resilience, the National Action Plan on Climate Change (NAPCC) was launched at the national level on June 30, 2008, in India. This plan comprises various measures, including the NSM, NMEEE, NMSH, NWM, and NMSKCC, to ensure a comprehensive approach to climate action (Pandve, 2009).

Conclusion

Green banking, as a response to global climate change, aims to promote environmentally friendly practices in and reduce the carbon footprint associated with banking activities. This approach not only increases funding for environmental projects, but also discourages activities that may harm the environment. The influence of banks on the environment, both direct and indirect, highlights the importance of adopting green banking practices. Various environmentally friendly financial products and services have emerged, such as paperless banking, green-building initiatives, green financing and loans, and green mortgages. In vulnerable developing countries, such as Bangladesh and India, the adoption of green banking activities is crucial for sustained growth and environmental protection, especially in the face of heightened climate change risks.

This study strongly recommends that the government should implement awareness programs to educate business organizations and

individual banks about the numerous benefits of green banking practices. Such programs can enable banks to offer various eco-friendly products, services, and low-interest financing options to attract customers and citizens towards sustainable choices. In developing countries, green banking initiatives should especially focus on clean and affordable energy, which promotes environmental sustainability and efficient resource utilization.

As such, banking programs focused exclusively on supporting clean and affordable energy initiatives in developing countries should be developed. These programs should allocate financial resources towards the implementation of climate mitigation, such as tree plantations, solar energy projects, renewable energy endeavors, mini-power plants, and other sustainable development initiatives. This approach can enable Bangladesh and India to make significant strides towards achieving their SDGs.

Research implication

This comparative study yields noteworthy implications for both scholars and bankers, offering valuable insights into green banking initiatives and practices in two significant South Asian economies. The findings lay the foundation for heightened corporate responsibility and a broader awareness of sustainability within the banking sector.

Policy formulation and implementation

This study provides valuable information pertaining to the green banking policies, practices, and initiatives of both the SBI and BB. The findings also study offer valuable insights for policymakers and regulators in both nations. They can benefit from each other's experiences by identifying best practices and developing more effective policies for promoting sustainable banking practices across the banking industries in Bangladesh and India. This cross-national exchange can shape the development and adoption of robust green banking policies in both countries.

Environmental impact assessment

A comparative evaluation of the environmental impact and sustainability efforts of SBI and BB provides an avenue for measuring the effectiveness of their respective approaches in reducing environmental risks and promoting sustainable banking practices. This comparison can serve as a crucial tool for determining the extent to which the initiatives of these banks are aligned with local, national, and international sustainability goals, such as the SDGs.

Stakeholder perception and social awareness

Understanding the perceptions and levels of awareness of various stakeholders, including customers, shareholders, employees, and the general public, is important because they play a crucial role in assessing the effectiveness of green banking projects. This study examines how well bank commitment to sustainability and communication efforts are received by these stakeholders. Identifying gaps in stakeholder understanding can foster the implementation of targeted awareness programs, thereby promoting a culture of sustainability among diverse stakeholders.

Limitation and future research direction

We only used published data and information from the SBI and BB. Future studies should focus on empirical investigations using econometric methodologies concerning key macroeconomic variables.

Declaration of Generative AI and AI-assisted technologies in the writing process.

Author contributions

MHR and JR deals with writing, empirical analysis and revision. TT deals with writing, MHR and MAE provide general guidance, proof reading and improved the draft.

CRediT authorship contribution statement

Md. Hasanur Rahman: . **Junaid Rahman:** Formal analysis, Methodology, Resources, Writing – original draft. **Tipon Tanchangya:** Conceptualization, Methodology, Software, Writing – original draft. **Miguel Angel Esquivias:** .

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Akomea-Frimpong, I., Adeabah, D., Ofosu, D., & Tenakwah, E. J. (2022). A review of studies on green finance of banks, research gaps and future directions. *Journal of Sustainable Finance & Investment, 12*(4), 1241–1264. https://doi.org/10.1080/20430795.2020.1870202

Ashiq, M. A., & Shahir, F. (2019). Challenges of Green Banking in the Context of Bangladesh. *Available at: Challenges of Green Banking in the Context of Bangladesh. pdf. Last accessed on Nov*, *22*, 2022.

Aubhi, R. U. (2016). The evaluation of green banking practices in Bangladesh. *Research Journal of Finance and Accounting, 7*(7), 93–125. https://www.iiste.org/Journals/index.php/RJFA/article/view/30055/30871.

Azizuddin, K. (2023). State Bank of India issues ESG bond. Available at: https://www.responsible-investor.com/state-bank-of-india-issues-esg-bond-framework/.

Bangladesh Bank. (2022). Policy on Green Bond Financing for Banks and FIs.

BCCT. (2021). Bangladesh Climate Change Trust. Available at: //www.bcct.gov.bd/site/page/e6fb75e8-f5e5-4bed-8adc-e6183e69353a.

Bekuma, T., Mamo, G., & Regassa, A. (2023). Indigenous and improved adaptation technologies in response to climate change adaptation and barriers among smallholder farmers in the East Wollega Zone of Oromia, Ethiopia. *Research in Globalization, 6*, Article 100110. https://doi.org/10.1016/j.resglo.2022.100110

Bhardwaj, B. R., & Malhotra, A. (2013). Green banking strategies: Sustainability through corporate entrepreneurship. *Greener Journal of Business and Management Studies, 3*(4), 180–193. https://doi.org/10.15580/GJBMS.2013.4.122412343.

Bukhari, S. A. A., Hashim, F., & Amran, A. (2020). Green Banking: A road map for adoption. *International Journal of Ethics and Systems, 36*(3), 371–385. https://doi.org/10.1108/IJOES-11-2019-0177

CBI (2019). *Green finance state of the market – 2019 update. December 2017*, 2017–2020.

Chen, Z., Mirza, N., Huang, L., & Umar, M. (2022). Green banking—can financial institutions support green recovery? *Economic Analysis and Policy, 75*, 389–395. https://doi.org/10.1016/j.eap.2022.05.017

Chen, Y., & Zhao, Z. J. (2021). The rise of green bonds for sustainable finance: Global standards and issues with the expanding Chinese market. *Current Opinion in Environmental Sustainability, 52*, 54–57. https://doi.org/10.1016/j.cosust.2021.06.013

Climate Bonds Initiative. (2019). *ASEAN Green Finance: State of the Market 2018. November*, 16. https://www.climatebonds.net/system/tdf/reports/asean_sotm_18_final_03_web.pdf?file=1&type=node&id=35691&force=1, Accessed 24 August, 2023.

Das, N., Gangopadhyay, P., Alam, M. M., Mahmood, H., Bera, P., Khudoykulov, K., ... & Hossain, M. E. (2023). Does greenwashing obstruct sustainable environmental technologies and green financing from promoting environmental sustainability? Analytical evidence from the Indian economy. *Sustainable Development*. https://doi.org/10.1002/sd.2722.

De Silva, P. S. A. (2019). Green banking-The way forward creating sustainable competitive advantage. *Association of Professional Bankers Sri Lanka*, 259–270.

Devi, A. (2018). Mobile banking: The revolution in digitalization of financial services with special reference to State Bank of India. *International Research journal of Management Science and Technology, 9*(4), 49–58.

Dhaka Tribune. (2023). BB brings 5000C green transformation fund. Retrieved from: https://www.dhakatribune.com/foreign-affairs/2023/07/11/shahriar-bangladesh-india-trade-in-rupee-a-successful-story-between-trusted-neighbours.

Esquivias, M. A., Hassan, O. I., & Sheikh, A. (2023). Evidence-based examination of the consequences of financial development on environmental degradation in the indian setting, using the ARDL model. *International Journal of Energy Economics and Policy, 13*(1), 281–290. https://doi.org/10.32479/ijeep.13800.

Evans, A., & Steven, D. (2012). *Sustainable Development Goals: A Useful Outcome from Rio+ 20?* Center on International Cooperation.

Faruque, M. O., Biplob, M. N. K., Al-Amin, M., & Patwary, M. S. H. (2016). Green banking and its potentiality & practice in Bangladesh. *Science Journal of Business and Management, 4*(2), 28–33. https://doi.org/10.11648/j.sjbm.20160402.12.

Giridhar, K. V., & Sudhakar, K. G. (2017). Green banking: Issues and challenges in India. *International Journal of Latest Technology in Engineering, Management and Applied Science, 6*(6), 130-132. https://www.ijltemas.in/DigitalLibrary/Vol.6Issue6/130-132.pdf.

Gupta, J. (2015). Role of green banking in environment sustainability: A study of selected commercial banks in Himachal Pradesh. *International Journal of Multidisciplinary Research and Development, 2*(8), 349–353.
Heffernan, S. (2005). *Modern banking*. Hoboken, NJ, USA: John Wiley & Sons:
Hindu, T. (2011). SBI to introduce green-channel counter at more branches. Retrieved from: http://www.thehindu.com/business/Industry/sbito-introduce-greenchannel-banking-at-morebranches/article2008949.ece. Accessed 1 September, 2023.
Hoque, N., Mowla, M., Uddin, M. S., Mamun, A., & Uddin, M. R. (2019). Green banking practices in Bangladesh: A critical investigation. *International Journal of Economics and Finance, 11*(3), 58–68. https://doi.org/10.5539/ijef.v11n3p58
Hossain, D. M., Bir, A. T. S. A., Sadiq, A. T., Tarique, K. M., & Momen, A. (2016). Disclosure of green banking issues in the annual reports: A study on Bangladeshi banks. *Middle East Journal of Business, 11*(1), 19–30. https://doi.org/10.5742/MEJB.2015.92758
HSBC. (2023). ASEAN Sustainable Finance State of the Market 2022 Accessed 10 Sep, 2023 https://www.business.hsbc.com/-/media/media/gbm-global/pdf/articles/cbi-asean-sustainable-finance-state-of-the-market-2022-report.pdf?download=1.
IEA. (2020). China' s emissions trading scheme (2020). International Energy Agency. https://www.iea.org/reports/chinas-emissions-trading-scheme. Accessed 12 Sep, 2023.
IEA. (2023). Tracking SDG7: The Energy Progress Report, 2023. Retrieved from: https://www.iea.org/reports/tracking-sdg7-the-energy-progress-report-2023. Accessed 12 Sep, 2023.
IFC (2019). IFC supports Bangladesh Bank to promote domestic green bond market, 2019. Available at: https://pressroom.ifc.org/all/pages/PressDetail.aspx?ID=17686#:~:text=Green%20bonds%20are%20an%20asset,meaningful%20green%20bond%20market%20development.
India CSR Network. (2018). State Bank of India to have annual flagship 'SBI Green Marathon. Available at: https://indiacsr.in/state-bank-india-annual-flagship-sbi-green-marathon/.
Infrapppworld. (2014). Evaluating the environment for public-private partnerships in Africa - The Economist & World Bank. Available at: https://www.infrapppworld.com/report/evaluating-the-environment-for-public-private-partnerships-in-africa-the-economist-world-bank.
IRENA. (2023). Tracking SDG7: The energy progress report 2023. Available at: https://www.irena.org/Publications/2023/Jun/Tracking-SDG7-2023. Accessed 20 August, 2023.
Islam, M. S., & Das, P. C. (2013). Green banking practices in Bangladesh. *IOSR Journal of Business and Management, 8*(3), 39–44. https://doi.org/10.9790/487X-0833944
Kaur, K., & Sandhu, V. (2019). Green Initiatives in Banking Sector: A study of State Bank of India (SBI). *ZENITH International Journal of Multidisciplinary Research, 9*(7), 111–120.
Khairunnessa, F., Vazquez-Brust, D. A., & Yakovleva, N. (2021). A review of the recent developments of green banking in Bangladesh. *Sustainability, 13*(4), 1904. https://doi.org/10.3390/su13041904
Khan, A. G., Hossain, M. A., & Chen, S. (2021). Do financial development, trade openness, economic development, and energy consumption affect carbon emissions for an emerging country? *Environmental Science and Pollution Research, 28*, 42150–42160. https://doi.org/10.1007/s11356-021-13339-1
Khatun, M. N., Sarker, M. N. I., & Mitra, S. (2021). Green banking and sustainable development in Bangladesh. *Sustainability and Climate Change, 14*(5), 262–271. https://doi.org/10.1089/scc.2020.0065
KPMG India. (2017). Independent Assurance Statement. Available at: https://www.climatebonds.net/files/files/KPMG%20State%20Bank%20of%20India%20pre%20issue%20statement%20PUBLIC.pdf.
Kumar, K., Sharma, H., Khan, W., & Kumar, R. (2022). Factors influencing adoption of green banking practices: Evidence from commercial banks in India. *Journal of Asia Entrepreneurship and Sustainability, 18*(1), 41–57.
Kwakwa, P. A. (2023). Sectoral growth and carbon dioxide emission in Africa: Can renewable energy mitigate the effect? *Research in Globalization, 6*, Article 100130. https://doi.org/10.1016/j.resglo.2023.100130
Lalon, R. M. (2015). Green banking: Going green. *International Journal of Economics, Finance and Management Sciences, 3*(1), 34–42. https://doi.org/10.11648/j.ijefm.20150301.15.
Lee, J. W. (2020). Green finance and sustainable development goals: The case of China. *Journal of Asian Finance Economics and Business, 7*(7), 577–586. https://doi.org/10.13106/jafeb.2020.vol7.no7.577.
Madaleno, M., Dogan, E., & Taskin, D. (2022). A step forward on sustainability: The nexus of environmental responsibility, green technology, clean energy and green finance. *Energy Economics, 109*, Article 105945. https://doi.org/10.1016/j.eneco.2022.105945
Majekodunmi, T. B., Shaari, M. S., Abidin, N. Z., & Esquivias, M. A. (2023). The environmental influence of national savings in D-8 countries: Empirical evidence using an ARDL model. *Environmental Science and Pollution Research, 30*(41), 94456–94473. https://doi.org/10.1007/s11356-023-28865-3
Maybank Sustainability Report 2021. (2022), Maybank Annual Report 2021, https://www.maybank.com/iwov-resources/documents/pdf/annual-report/2021/Maybank-Sustainability-Report-2021.pdf.
MERCOM. (2021). SBI Has Provided ₹319.18 Billion in Renewable Energy Project Finance as of FY 2021. Retrieved from: https://mercomindia.com/sbi-provided-renewable-energy-project-finance. Accessed 15 August, 2023.
Mir, A. A., & Bhat, A. A. (2022). Green banking and sustainability–a review. *Arab Gulf Journal of Scientific Research, 40*(3), 247–263. https://doi.org/10.1108/AGJSR-04-2022-0017
Mittal, S., Chaudhry, S., & Bhadauria, S. S. (2023). Green banking-the path leading to sustainable economic growth. In *Smart analytics, artificial intelligence and sustainable performance management in a global digitalised economy* (pp. 199–213). Emerald Publishing Limited. https://doi.org/10.1108/S1569-37592023000110B013.
MOEF. (2022). Climate Change Initiatives of Bangladesh. Available at: http://doe.portal.gov.bd.
Muganyi, T., Yan, L., & Sun, H. (2021). Environmental Science and Ecotechnology Green finance, fintech and environmental protection: Evidence from. *Environmental Science and Ecotechnology, 7*, Article 100107. https://doi.org/10.1016/j.ese.2021.100107
Munjer, M. A., Hasan, M. Z., Hossain, M. K., & Rahman, M. F. (2023). The obstruction and advancement in sustainable energy sector to achieve SDG in Bangladesh. *Sustainability, 15*(5), 3913. https://doi.org/10.3390/su15053913
Muryani, M., Nisa', K., Esquivias, M. A., & Zulkarnain, S. H. (2023). Strategies to control industrial emissions: An analytical network process approach in East Java, Indonesia. *Sustainability*, *15*(10), 7761. https://doi.org/10.3390/su15107761.
Nahrin, R., Rahman, M. H., & Majumder, S. C. (2023). Economic Growth and Pollution Nexus in Mexico, Colombia and Venezuela (G-3 Countries): Role of Renewable Energy on carbon dioxide emissions. *Energies, 16*, 1076.
Neeraja, T. S., & Joseph, R. (2021). Green initiatives of SBI: A customer-centric study. *EPRA International Journal of Economic and Business Review-Peer Reviewed Journal, 9*(4), 14–19. https://doi.org/10.36713/epra6314.
Nomura, K. (2023). Toward the energy transition of Japan. In *Energy Productivity and Economic Growth: Experiences of the Japanese Industries, 1955–2019* (pp. 209–246). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-19-6494-7_6.
Pandve, H. T. (2009). *Indian Journal of Occupational and Environmental Medicine, 13*(1), 17–19. https://doi.org/10.4103%2F0019-5278.50718.
Rahman, M. H., Voumik, L. C., Nafi, S. M., & Zimon, G. (2023). Effects of Tourism and other Macroeconomic Variables on Women Employment in Agriculture, Industry and Service Sectors: Evidence from African Countries. *Current Issues in Tourism.* https://doi.org/10.1080/13683500.2023.2227767.
Rahman, M. H., & Majumder, S. C. (2022). Empirical analysis of the feasible solution to mitigate the CO_2 emission: Evidence from next-11 countries. *Environmental Science and Pollution Research., 29*, 73191–73209. https://doi.org/10.1007/s11356-022-20908-5
Raihan, A., Voumik, L. C., Rahman, M. H., & Esquivias, M. A. (2023). Unraveling the interplay between globalization, financial development, economic growth, greenhouse gases, human capital, and renewable energy uptake in Indonesia: Multiple econometric approaches. *Environmental Science and Pollution Research, 1–17*. https://doi.org/10.1007/s11356-023-30552-2
Risal, N., & Joshi, S. K. (2018). Measuring green banking practices on bank's environmental performance: Empirical evidence from Kathmandu valley. *Journal of Business and Social Sciences, 2*(1), 44–56. https://doi.org/10.3126/jbss.v2i1.22827
Rozman, A. T., & Azmi, N. A. (2022). Green Sukuk, Environmental Issues and Strategy. *IOP Conference Series: Earth and Environmental Science, 1067*(1). https://doi.org/10.1088/1755-1315/1067/1/012085
Sahoo, B. P., Singh, A., & Jain, N. (2016). Green banking in India: Problems and prospects. *International Journal of Research-Granthaalayah, 4*(8), 92–99. https://doi.org/10.29121/granthaalayah.v4.i8.2016.2566.
Sarma, P., & Roy, A. (2021). A scientometric analysis of literature on green banking (1995-March 2019). *Journal of Sustainable Finance & Investment, 11*(2), 143–162. https://doi.org/10.1080/20430795.2020.1711500
SBI. (2023). Green Remit Card. Retrieved from: https://sbi.co.in/web/personal-banking/cards/debit-card/green-remit-card#menu_1. Accessed 20 August, 2023.
Sharma, M., & Choubey, A. (2022). Green banking initiatives: A qualitative study on Indian banking sector. *Environment, Development and Sustainability, 24*(1), 293–319. https://doi.org/10.1007/s10668-021-01426-9
Singh, M. A., & Zaheer, A. (2023). Review on impact of Ai on green banking towards sustainability with special reference to Indian public and private bank. *Journal of Survey in Fisheries Sciences, 10*(4S), 2475–2492.
SREDA. (2021). Sustainable and Renewable Energy Development Authority Future Plans and Goals. Retrieved from: http://www.sreda.gov. Accessed 18 August, 2023.
Srivastava, S. (2022). Indian banks face climate risks: Time for SBI to walk the green talk. Available at: https://ieefa.org/resources/indian-banks-face-climate-risks-time-sbi-walk-green-talk.
Streimikis, J., & Baležentis, T. (2020). Agricultural sustainability assessment framework integrating sustainable development goals and interlinked priorities of environmental, climate and agriculture policies. *Sustainable Development, 28*(6), 1702–1712. https://doi.org/10.1002/sd.2118
Tara, K., & Singh, S. (2014). Green banking: An approach towards environmental management. *Prabandhan: Indian Journal of Management, 7*(11), 7–20. https://doi.org/10.17010/pijom/2014/v7i11/59258.
The financial express (2020). Number of ATM booth reaches 10,924. Available at: https://beta.thefinancialexpress.com.bd/.
Transition, E., Indonesia, T., Finance, S., Towards, F., & Target, N. D. C. (2023). *Indonesia Sustainable Finance Outlook 2023*. https://iesr.or.id/wp-content/uploads/2022/10/IESR-Indonesia-Sustainable-Finance-Outlook-ISFO-2023.pdf. Accessed 1 Sep, 2023.
Uddin, M. N., & Ahmmed, M. (2018). Islamic banking and green banking for sustainable development: Evidence from Bangladesh. *Al-Iqtishad Journal of Islamic Economics, 10*(1), 97–114. https://doi.org/10.15408/aiq.v10i1.4563.
Ullah, M. M. (2013). Green Banking in Bangladesh-A comparative analysis. *World Review of Business Research, 3*(4), 74–83. https://doi.org/10.18034/abr.v3i2.90.
Ullah, M. A. (2020). Green banking in the way of sustainable development: An overview of practice and progress in Bangladesh. *Canadian Journal of Business and Information Studies, 2*(5), 105–119. https://doi.org/10.34104/cjbis.020.01050119.
UN, 2023. Take Action for the Sustainable Development Goals. Available at:.

UNDP, 2015. What are the Sustainable Development Goals? Retrieved from: https://www.undp.org/sustainable-development-goals. Accessed 1, August 2023.

Vadrale, K. S., & Katti, V. P. (2016). Green banking initiatives by Indian public and private sector banks. In The international conference on green banking for green industry and green economics, Belgaum, India, 12-13th February (pp. 1–14).

Voumik, L. C., Rahman, M. H., Nafi, M. S., Hossain, M. A., Ridzuan, A. R., & Yusop, N. Y. M. (2023). Modelling a sustainable non-renewable, and renewable energy based on the EKC hypothesis for Africa's ten most popular tourist destinations. *Sustainability, 15*, 4029. https://doi.org/10.3390/su15054029

Weinhofer, G., & Busch, T. (2013). Corporate strategies for managing climate risks. *Business Strategy and the Environment, 22*(2), 121–144. https://doi.org/10.1002/bse.1744

World Bank, 2021.Climate Change Could Force 216 Million People to Migrate Within Their Own Countries by 2050.

Yadav, R., & Pathak, G. (2013). Environmental sustainability through green banking: A study on private and public sector banks in India. *OIDA International Journal of Sustainable Development, 6*(08), 37–48.

Zhelyazkova, V., & Kitanov, Y. (2015). Green banking–definition, scope and proposed business model. *Journal of International Scientific Publications, 9*(1), 309–315.

Zheng, G. W., Siddik, A. B., Masukujjaman, M., Fatema, N., & Alam, S. S. (2021). Green finance development in Bangladesh: The role of private commercial banks (PCBs). *Sustainability, 13*(2), 795. https://doi.org/10.3390/su13020795

Zhixia, C., Hossen, M. M., Muzafary, S. S., & Begum, M. (2018). Green banking for environmental sustainability-present status and future agenda: Experience from Bangladesh. *Asian Economic and Financial Review, 8*(5), 571–585. https://doi.org/10.18488/journal.aefr.2018.85.571.58