Green Financing Status of Schedule Banks in Bangladesh

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**Abstract**

Bangladesh is the 7th most vulnerable country regarding climate risk index in the world, though it’s minimal contribution to the problem. This study aims to examine the green financing status and find out the position of commercial banks regarding target achieved set by the central bank in Bangladesh. This study gathered quarterly published data by Bangladesh Bank sustainable department. This study finds 22 banks out of 61 achieved green finance target where United Commercial Bank PLC stood in the top position at 36.21%, next to Jamuna Bank PLC at 29.85%, IBB PLC at 22.42%, and Bank Asia stood at the end at 5.47%. On the other hand, 17 commercial banks fulfill the sustainable financing target of the total term loan disbursement set by Bangladesh Bank. It is observed that in Q4, 2023, 17 banks out of 61 had exposure to green finance, where 16 banks were PCBs. Only Bangladesh Krishi Bank occupied the top position, accounting for 56.48% of sustainable finance next to NRB Bank PLC 42.86%, BRAC Bank PLC 41.32%, etc., and Jamuna Bank PLC stood last position at 21.57%. The study also found the total target achieved by banks was 9.09% in green finance and 27.24% in sustainable finance, which exceeded the target set by the Bangladesh bank and it is a milestone to achieve SDGs set by the UN by 2030.

**Keywords:** Status, Bangladesh bank, Green banking, Green financing, Refinancing, Environment, SMART

**1. Introduction**

Bangladesh is considered a developing economy**;** managing its environment requiresfocusing on the business fraternity, especially in the bankingsector (Hossain & Rana, 2024)**.** This sector needs to address ecological and social hazards linked with funding exerciseswhich is must in prevailing credit rating support. Green and acceptable interferences are vital for producing future growth more endurable. Financial organizations can alter the trends of a hygienic planet to a large extent. Banks can take steps to implement a go-green strategy to inspire clients to accept hygienic know-how. This strategy expects a favorable firm that cuts costs and encourages entry to new marketplaces. All FIs should manage carbon footprint of their customers or ventures to confirm their ultimate existence in the long run. Financial sectors back to ecological erosion via financing in several contaminant factories, so we must assume corrective measures against all wrong activities. Bangladesh Bank should force all financial institutions to establish green banking guidelines to curb their environmental pollution, providing loans to atmosphere-responsive schemes. The word green has a broad sense of usage, which covers the social responsibility of the planet's inhabitants, where banks are treated as corporate citizens in modern society. Go green strategy in banking activities usually plays a decisive part in implementing maintainable progress of banks and green economy. Generally, green funding refers to lending practices that substitute ecologically accountable funding and inside banking activities that minimize carbon and conservatory gas releases. Green financing is also called ecosystem-supportive, naturally welcoming, and ethical financing, which is used to stop environmental pollution and keep the only earth in the universe habitable.  Greenbanking is a new concept that leads people to earn profit and save the planet without compromising on environmental pollution. Every bank should play a proactive role in going green and trying to induce businesses to move for environment-friendly funding and use modern technology. Ullah (2012) mentioned green banking works like a wheel as a linked chain as shown in figure 1.

Environment

Bank

Customers

Figure 1: Relationship among Bank, Customers and Environment

Green banking may come in many ways such as providing innovative green products, using online banking activities, paying utility bills online, purchasing green mortgages, issuing green credit cards, debit cards, etc.

**2. Background of the Study**

The banking sectors of Bangladesh play a pivotal role by initiating green financing activities, creating a green economy, and saving the environment. Homo sapiens cannot alter the emission of gases such as carbon dioxide or the globe's trajectory near the sun. However, they can hold the inflated portion of carbonic acid gas and their influence on the climate. In the last century, carbonic acid gas engagement has grown alarmingly in the air, and human beings are liable for this. The leading reason for increased carbonic acid tiers in the air is the burning of fossil energies. Industrial activities rose rapidly from the end of the 19th century, and many plants were built. These plants demanded power, which was fulfilled through the blast of coal. Excluding coal, other power bases, such as oil and natural gas, were ignited to heat our houses, run automobiles and aircraft, and beget power supply. At present, nearly 85 million barrels of natural oil are steamed every day. Every time a fossil raw material is burned, it emits CO2 into the air. Thus, it is evident that human beings are causing more conservatory gases like CO2 worldwide. Besides, we also support the conservatory effect by intentionally unclogging forests, which implies cutting down trees. Each year, people consume massive woodland to get wood, make thin rooms for mining, and make habitats (Alam & Islam, 2023; Rabiul Islam & Hossain, 2018). This loss of woodlands causes double concerns, such as fumed-up trees emitting significant volumes of CO2 into the air. On the other hand, as forests absorb much CO2 from the air and deliver Oxygen instead, we also eliminate an essential storehouse of Oxygen when we empty woodlands. Green financing which also called environment-responsive financing can solve this big problem.  The concept of green banking was founded in 2009 in the state of Florida, USA. In 2009, Chris Van Hollen, a congressman, introduced the "Green Bank Act" to offer financial support increasing energy usage efficiency and reduce carbon emissions under the ownership of the U.S. government. In May 2012 first GB's persistent actions was granted membership to the Global Alliance for Banking on Values (GABV). In the complex financial environment where 1st GB opened and functioned, it attained outstanding profitability in 19 months, with current assets of about 252 million dollars as of December 2013.

**3. Statement of the Problem**

The world faces severe pollution problems like air, water, soil, noise, etc. And at the same time, in the name of environmental change, various types of adverse effects, such as seal level rise, global warming, biodiversity damaged, imbalanced ecosystems, non-curable diseases, mental depression, earthquakes, cyclones, floods, drought, extreme heat wave, cold wave, corona, flu, thundering, tide etc. started unexpectedly. Bangladesh is not out of the mentioned adverse situation. According to Hasnat et al. (2018), Bangladesh might lose 15 percent of its land if the sea level increases by 1 meter and 30 million people emigrate. World Bank report (2018) published that the highest 28% of people died in 2015 because of environmental pollution-related diseases in the world. They are realizing that environmental issues have become a burning question in Bangladesh. The overall ecological situation in our country is alarming enough. Different studies have found Dhaka is one of the most densely populated megacities in the world. According to WHO reports, noise pollution occupies the third position next to air and water pollution, Hasnat et al. (2018). According to the World Economic Forum's Golden Report 2018, Bangladesh ranked 10th among all the world's plastic-polluting countries. Though heavy industries are responsible for these adverse effects, they should take the liabilities first (Rana & Hossain, 2023). Now is the time to examine, evaluate, and take the correct initiatives to protect environmental pollution. Bangladesh is an emerging economy and dreams of being an upper-middle income country by 2030 and a high-income country by 2041, which is only possible with sustainable banking. According to BBS reports, the contribution of banking sectors to the Bangladesh economy regarding GDP from 2017 to 2020 was 9.95%, 8.51%, 7.38%, and 4.19%, respectively, which indicates a decreasing trend. Not only that, credit conditions, classified loans, profitability, sustainability, etc., also declined over the years. However, commercial banks should invest their funds in indirect green and sustainable finance to survive in the competitive market and increase profitability. Three multifaceted approaches are involved in making our planet green: economic, environmental, and social. By addressing the following factors holistically, we can efficiently work towards going green and ensuring a sustainable, more resilient, and healthier future for the next generation.

4. **Significance of the Study**

The population growth rate in Bangladesh is 1.1% per annum, while the commercial energy demand will increase by 400% by 2038 compared to 2018. Bangladesh is the most fossil fuel-dependent country in Asia far behind other countries in decarburization progress. Bangladesh is suffering from an energy crisis that is negatively affected by climate change. As of 2022, Bangladesh depends on fossil fuels for about 98% of total electricity demand. The energy mix comprises 59% natural gas, 24% fossil fuel, and 15% coal (Ember). The remaining 2% includes solar, biofuel, wind, and water. Instead of increases, Bangladesh decreased its non-fossil fuel electricity production from 3% to 2% between 2015 and 2022. However, the rest of the Asian countries increased it from 24% to 32% during that period. So, Bangladesh is the bottommost in Southeast Asia and at the back of Pakistan (43%) and India (23%). According to The Daily Star report, natural gas will run out in 9 to 11 years. According to the Integrated Energy and Power Master Plan (IEPMP), draft gas consumption will grow 160% to 360% to generate 30% of power by 2050. About 50% of its required financing will go to the natural gas sector. They estimate Bangladesh may import 49 million tons of LNG by 2050. According to the IEEFA, coal and oil plants in Bangladesh are just a single exception and run on imported fuels. Intergovernmental Panel on Climate Change guesses that climate alteration may cost 2-9% of its GDP by 2050 (The Daily Financial Express.bd). Bangladesh is in dire need of a power plant that prioritizes de-carbonization and energy independence. We need a framework designed to solve the energy poverty problem. Bangladesh must focus on removing the fossil fuel subsidies, straining the budget, and dis-incentivizing investment in renewables. Studies show that complete fossil fuel removal will increase GDP by up to 2.3%. Utilizing just one-third of the 1500 Km2 fishpond area can confirm 15 GW of floating photovoltaic (FPV). The low-water areas and large ponds can offer up to 45 GW of solar power. Regarding wind power, Bangladesh has a territory of 20000 km2 with wind speediness of up to 7.75 m/s, apposite for 30 GW of capacity. Research found that utilizing just 4% of the country’s territory would ensure enough capacity for a 100% renewable energy-powered system. Starting with small steps would guarantee immediate results. They identified that just 2 GW of installations would be sufficient for Bangladesh to save $ 1.1 billion per year from fossil import costs. Experts note that Bangladesh could exploit its vast geothermal resources by utilizing gas drilling infrastructure. The IEEFA estimates the Leveled Cost of Electricity (LCOF) from rooftop and utility-scale solar at around $0.05/KWh and $0.072/KWh, respectively, compared to $0.084/KWh during the fiscal year 2021-22. According to Ember, if Bangladesh had prioritized solar power between 2022 and 2024, it could have reduced LNG imports by 25% and saved $2.7 billion. Solar power could have reduced Bangladesh’s spot LNG purchased by 25% and saved $2.7 billion by 2024. The IEEFA estimates that the country would need between $1.53 and $1.71 billion annually in financing between 2024 and 2041 to achieve its 40% clean energy target. This figure is lower than the power sector’s FY 2021-22 subsidy burden of $2.82 billion. Humans cannot change the natural system, such as the sun’s radiation or the Earth’s orbit around the sun. Nevertheless, they can switch GHG effects on the atmosphere, reduce environmental pollution, etc. Over the last century, CO2 absorption has increased alarmingly in the troposphere. Among many other causes, burning fossil fuel is the main one. Industrial activities have increased so fast since the beginning of the 20th century, giving rise to many factories. Factories need power that is shaped by the burning of fossil fuels and increases the temperature of the Earth. Studies found that nearly 85 million drums of unpolished oil are burned every day in Bangladesh. Fossil fuel is scorched as raw material and constantly releases CO2 into the air. Therefore, we generate substantial greenhouse gases all over the world.

**5. Research Questions**

The research question serves as a guide for what needs to be examined in the study. The study thrives to explore the present status of green financing initiatives taken by Bangladesh bank during last decade. What is the position of scheduled banks regarding green financing and sustainable financing target set by the Bangladesh bank?

**6. Objectives of the Study**

This study aims to depict the green financing scenario of financial institutions in Bangladesh. The specific objectives of the study is: To examine the present status of green financing of scheduled banks in Bangladesh.

**7. Limitations of the study**

First, this research entirely depends on secondary data collected from Bangladesh bank sustainable department. This research only deals with the banking sectors in Bangladesh. Secondly, no modern statistical tools like STATA, SPSS, and EVIWES etc. were followed rather MS-excel. Finally, This study only explored the compliance of Bangladesh bank green banking initiatives for the year 2023 and 2024 first quarter.

**8. Review of Literature**

**Some Empirical Research Review**

Table 1: Literature review summary

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SL** | **Author, Year, and Country** | **Study Objectives** | **Methods** | **Variables** | **Findings** |
| 1 | Zeng et al. (2022), China | i.to analyze green finance and urban haze pollution | Ex- post facto and correlation, regression research designed, the sample size was 639, four years of data were collected. | The independent variable was:  i. urban green bond  ii. annual average concentration of fine particles. Control variables were size, growth and profitability | i. A negative correlation between green finance and urban haze pollution ii. Green finance increased environment quality with modern technology. |
| 2. | Fang and Shao (2022), China | i. to investigate the influence of green finance on green technology innovation. | In the cross-sectional survey, primary data was used. | The independent variable was -  i. Command, control and environmental regulation  ii. Marketing incentives environmental regulation  iii. GF | i. a positive significant correlation between command, control, environment regulation and green technology innovation  ii. a positive correlation between market incentives, environment regulation and green technology. |
| 3. | Hasan et al. (2020), Bangladesh | i.to find out the effects of GB on ROA, ROE and MV | Ex post facto association research design, sample size is 14 banks, secondary data was used. | The independent variable was - green banking consisting of a volume of risk management committees. The dependent variable was  i. ROA ii. ROE iii. MV | i. The green cost, size of bank, and risk management positively affect ROA, ROE, and MV  ii. Operating cost negatively affects ROA, ROE, and MV |
| 4. | Jatana, R., & Jain, H. (2020), India | i. to investigate the effect of GB on bank performance. | Secondary data was used. | The independent variable was -  i. total card transaction.  ii. total retail online clearing  iii. RTGS  iv. No. of cards transaction. | i. Highly positive correlation between performance and total card transactions, total retail electronic clearing, and RTGS |
| 5. | Akhter, I., Yasmin, S., & Faria, N. (2021), Bangladesh | i. To examine the status of green banking policy guidelines  ii. To explore the effect of GB on financial performance of banks. | DSE-listed commercial banks are sampled, and secondary data are analyzed. SPSS software was used for data interpretation. | The independent variable was -  i. Green initiative scores  ii. Green finance ratio | i. Nine banks out of 30 DSE-listed commercial banks did not report green financing information, while I bank started disclosing green financing data in 2017.  ii. green banking practices positively influence bank performance. |
| 6 | Karim, R. (2020), Bangladesh | i. To examine the status of adopting GB practices by banks. | Descriptive methods and secondary data was used. MS- excel software was applied. | He identified nine green investment areas. | i. The entire green investment is an upward trend up to 2017. |
| 7 | Sharma, M., & Choubey, A. (2021), India | i. Conceptual model was applied in GB initiatives.  ii. To show the 3 green banking indicators' impacts on 2 possible outcomes. | Exploratory and qualitative methods based on multiple case studies. They used primary and secondary data. | Three independent variables were –  i. green banking initiatives  ii. green brand image  iii. green bond trust. | i. The set target was not achieved. |
| 8 | Guang-Wen & Siddik (2022), Bangladesh | i.to examine CSR practices and GF on environmental performance in Bangladesh | It was a cross-sectional survey, Sample size was 388 bank employees, and used inferential statistics | The IV was:  i. economic  ii. social  iii.environmental and  iv. CSR dimensions. | i. Economic, social, environmental, and CSR practices positively and significantly affect the environmental performance of PCBs in Bangladesh |
| 9 | Zheng et al (2021a), Bangladesh | i. To investigate the mediating role of green finance on corporate sustainability performance of FIs in Bangladesh | Cross-sectional survey research design, convenience sampling methods, structured questionnaire. They used SEM to analyze data. | The independent variable was -  i. Economic  ii. Social and  iii. Environmental dimensions. | i. The economic dimension has positive and significant impact on the sustainability performance of PCBs.  ii. The social dimensions positively and significantly impact on sustainability performance of PCBs.  iii. The environmental dimension have positive and significant impact on the sustainability performance of PCBs. |
| 10 | Zheng et al (2021b), Bangladesh | i. to examine the bankers’ perceptions of GF development of PCBs in Bangladesh. | Cross-sectional survey research design, and convenience sampling methods, they used primary and secondary data for the period of (2014-2019).  Structured questionnaire. They used SEM to analyze data. | The independent variable was -  i. Economic dimensions  ii. Social dimensions  iii. Environmental dimensions and  iv. Source of GF | i. The economic dimensions positively and significantly impact bankers’ perception of GF.  ii. The social dimensions positively and significantly impact bankers’ perception of GF.   iii. The environmental dimensions positively and significantly impact bankers’ perception of GF.  iv. The source of GF positively and significantly affects bankers’ perception of GF. |
| 11 | Ikram, I. and Akhtar, S. (2021), Pakistan | i. to shed light and explore dynamic relations among green banking disclosure practices, firm value, and corporate governance mechanisms in SAARC countries. | Panel data set (2010-2019) is analyzed using STATA 14.2  They used econometric model | The independent variable was -  i. board size  ii. investors  iii. Green banking disclosure  iv. institutional ownership  and dependent variable was -  i. Tobin’s Q | i. Institutional ownership and board independence has significant negative impact on market value |
| 12 | Akomea, F, I., Adeabah, D., Ofosu, D., & Tenakwah, E. J. (2022), China. | i.to analyze green finance, environmental protection, climate change | A review of forty six relevant papers. They used meta-analysis | The independent variable was - green finance products. | i. Green bonds ii. green investments iii. climate finance iv. carbon finance v. green insurance vi. green credit and vii. green bonds are part of green finance products of banks. |
| 13 | Mir, A. A., & Bhat, A. A. (2022), India | i. to study GB practices, methods etc.  ii. the contribution of banks in environmental sustainability and SDGs. | The study was conceptual in nature.  It was conducted based on literature review. | The independent variable was :  Environmentally sustainable.  The dependent variable was:  i. green banking initiatives | i. People have to deal with banks which play a crucial role in the environment by developing robust and successful low-carbon economics.  ii. green banking undoubtedly benefits banks, industries, and the environment to some extent. |
| 14 | Khatun, M. N., Sarker, M. N. I., & Mitra, S. (2021) Bangladesh | i.to explore the pattern adopted by green banking activities in Bangladeshi banks. | The research was based on secondary data between (2014-2019). Quantitative method was adopted to interpret data. | The independent variable was - various green banking initiatives and dependent variable was - sustainable development. | i. Most of the PCBs and FCBs adopted green banking policies  ii. PCBs disbursed the highest loans to environmentally convenient projects followed by FCBs and SOCBs. |
| 15 | Zheng, G. W., Siddik, A. B., Masukujjaman, M., & Fatema, N. (2021), Bangladesh | i. to investigate the dimensions of GF and effects on the sustainability performance of FIs in Bangladesh. | They used SEM techniques to analyze collected data. | The IV was: the performance of FIs and dependent variable was - the Green finance dimensions of social, environmental, and economic. | i. The PCBs accounted for the highest GF of total green finance in Bangladesh.  ii. The dimensions of GF- social, environmental, and economic – have a positive effect on the sustainability performance of banks.  iii. About 95% of bankers thought GF is an important element in banking sectors' short-term and long-term development. |
| 16 | Azad, M. A. K et., al. (2022), Bangladesh | i. the recent trends of GF and SF of banks and NBFIs. | Primarily descriptive and secondary data, four quarters of the year 2021. They used Excel 2016 and SPSS 26 in data analysis. | The independent variable was - the performance of GF and SF.  The dependent variable was - green finance initiatives and policies developed by BB. | i. Bangladesh Bank made a significant performance to green the financial system by implementing various green projects.  ii. the total target achieved 3.16% in the GF and 9.32% in the SF which is still far behind the SDGs. |
| 17 | Talika, S., Verma, S., & Sharma, J. (2022), India | i. to examine the impact of the frequency of board meetings on the bank's performance. | Secondary data from 2015 to 2019, panel regression is analyzed. | The independent variable was - is ROA and IV is i. audit committee  ii. board meetings iii.no. of committee iv. Assets | There is no significant effect of any governance variables on ROA of the banks. |
| 18 | Walzer, M.,Tamimi, A. H. A., & Firmansyah, A. (2024), Indonesia. | i. to examine how banking financial performance and GB disclosure affect profitability. | Secondary data from 2018-2022 from 30 sample banks. They used panel data and applied regression analysis. | The DV was - Bank performance. The independent variable was -  i. the capital adequacy ratio  ii. the efficiency ratio  iii. Non-performing loans iv. the loan to deposit ratio | 1. The capital adequacy ratio and efficiency ratio negatively impacted bank profitability. 2. Non-performing loans and the loan-to-deposit ratio positively affect bank profit. |

Source: Prior literature and Desk studies, (2024)

**9.** **Research gap**

After introducing green banking guidelines in 2011 by Bangladesh Bank a lot of research works have been conducted throughout the year. Some researchers tried to show green banking policy implementation status, some other studies tried to find out the relationship between green financing and bank profitability in private commercial banks only, and some studies find out the factors affecting sustainability performance. Julia and Kassim (2019) made a comparison between Islamic banks and conventional banks regarding green banking performance. Akhter, I., Yasmin, S., & Faria, N. (2021) examined 30 DSE-listed commercial banks where 90% of the banks implemented above 60% of the green banking policy guidelines in the period (2016-2018). Still, none has attempted to depict the present situation of green financing and the impact of the selected green financing factors on bank profitability. So, the present situation demands complete research to reflect a total scenario of the status of green financing and its recent trend in Bangladesh.

**10. Present Status of Green Financing: Bangladesh Context**

Bangladesh is a low-lying country on the Ganges-Brahmaputra Delta, and about 75% of its territory lies less than 10 meters above sea level. The geographical location, dense population, climate vulnerability, and riverine landscape are the characteristics that make a strong case for green financing to support sustainable development. Mainstreaming green financing in renewable energy and climate-resilient is thus a significant policy challenge for Bangladesh. The GDP growth of over 6% in the last decades has accelerated the energy demand in Bangladesh. According to (IEA, 2015), at present, the primary source of energy is natural gas (56%), then biofuels (24%), crude oil (13%), coal (6%), and renewable energy (1%). The Bangladesh government has set 10% of the total power demand from renewable energy sources by 2020. The government also explores other energy sources such as renewable energy technology, nuclear power, solar, hydro, etc. The solar home system project is one of them, providing about 20 million people with access to solar electricity. Thus, it is essential to identify the policy barriers and find alternative solutions for green financing to ensure sustainable and reliable energy sources for Bangladesh. For the information, Bangladesh has already adopted some green financing projects, and Bangladesh Bank has declared some guidelines for banks and non-bank financial institutions to follow. There is a need to develop green financing instruments such as green investment trust funds, green loans, and green bonds. This study aims to investigate green financing in renewable energy sectors, its impact, and future trends. As commercial banks are reluctant to invest in green projects due to risks and return on investment, the government has established two flagship green funds:

i) Bangladesh Climate Change Trust Fund and

ii) Bangladesh Climate Change Resilience Fund, which are now the primary sources of green finance in our country. The initial allocation was tk.700 crore in 2010, but this trend has declined. Bangladesh Bank prepared a policy guideline for green banking to form a climate risk fund. It directed the banks to allocate at least 10% of their corporate social responsibility budget by providing direct grants or a reduced interest rate. They also instructed the banks and other financial institutions to provide green finance for specific green projects in 2016. The recent green product lists are attached in Appendix A. So far, all commercial banks have formed their green banking policy, green banking high-level committee, green banking unit, and green financing initiatives etc. Almost all banks follow and maintain the BB reporting structure and submit it quarterly basis.

**11. Refinance Initiatives of Bangladesh Bank at the end of Q1, 2024**

Bangladesh Bank created Tk. 200 crore refinancing scheme in 2009 for ETP, biogas, and solar energy. These funds increased from Tk. 200 crore to Tk. 400 crore to meet the increased demand for funding environmentally friendly projects. Bangladesh Bank introduced a refinancing scheme of Tk. 400 crore to offer refinance facilities to promote smooth financing in green projects (SFD circular No. 04, 24 July 2022 by BB consisting of VII articles). Only term loan is considered for refinance facility under this scheme. Financial institutions need funds to facilitate green financing. After that, they will finance several green sectors. To provide required funds and accelerate green banking activities, BB has introduced refinance schemes for renewable energy and eco-friendly sectors to facilitate banks and non-bank financial institutions to offer credit at a 1% interest rate and easy terms and conditions. Bangladesh Bank created BDT. 200 crores of funds for refinancing schemes. The following figure 2 shows the four main sectors and fund allotment. Besides, another ten sectors of refinance are: i) Solar mini-grid ii) LED bulb production plant  iii) Preparation of organic manure from slurry  iv) Solar battery reprocessing plant v) Medium-size biogas plant vi) PET bottle reprocessing plant  vii) Replacement of conventional lime kiln into energy-efficient kiln viii) Hydropower plant (Pico, micro, mini) based on the production capacity ix) Production of vermicomposting fertilizer with the purchase of 2 (two) cows and  x) Production of vermicomposting fertilizer without the purchase of 2 (two) cows.

**Green Transformation Fund**

USD 200 million

Euro 200 million

BDT 50 billion

**Technology Upgradation Fund** BDT 10 billion

**Shariah Based Refinancing Schemes for Green Products**

BDT 1.25 billion

**Green Products and Initiatives** BDT 10 billion

Figure 2: BB Refinancing Initiatives up to Q1, 2024.

**11.1 Category-wise Disbursement of BB's Refinance Scheme (in million BDT)**

Chart 1: The Bangladesh bank Refinance Scheme for the Green Initiatives from 2013 to 2023

The chart 1 shows 14 products of BB’s refinance fund allotment for the commercial banks in Bangladesh. It shows 11 years grand total of loan disbursement where green industry holds first position accounting Tk. 2244.37 million (31.06%) of total term loan and vermicomposting belongs to the last position accounting Tk. 12.26 million (0.16%) of total term loan.

**11.2 Bangladesh Bank Sustainable Finance at a Glance in 2023**

Table 2: Sustainable Finance (SF), Green Finance (GF), and Sustainable Linked Finance (SLF) (in million BDT)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Issues | Q1 | Q2 | Q3 | Q4 |
| Sustainable Finance | 353879 | 351961.04 | 322964 | 8,78,268 |
| Green Finance | 27759 | 31441 | 36044 | 64088 |
| Sustainable Linked Finance | 326120 | 320519 | 286920 | 8,14,180 |

Table 1 shows that, in the Q4 2023 period, banks' contribution to green finance was BDT 64088 million, which was BDT 36044 million greater than the Q3 2023 period. In Q4 2023, banks' contribution to sustainable finance was BDT 878268 million, which was BDT 322964 million greater than the Q3 2023 period. Both types of financing are in an upward mode. Sustainable finance is the summation of green finance and sustainable linked finance.

**11.3 The status of GF in Bangladesh based on bank types**

To date, 43 commercial banks are functioning under Bangladesh Bank's jurisdiction. The table 9 represents the green project's financing by four categories of banks in 2023. Among the four types of banks, PCBs are the highest contributors to Green Finance accounting for 40.01% of the total green finance, followed by FCBs 16.99%, SOCBs (6.10%), and SDBs (18.88%).

Chart 2: Green Finance trend line

Chart 2 shows the banks' GF trend over the last seven years. PCBs show a positive upward growth trend from 2015 to 2019 but a slight downward trend in 2020, whereas FCBs show an upward trend in 2019 and 2020. So, it can be said that Private Commercial Banks (PCBs) play a significant role in GF by investing in green projects.

**11.4 Overview of Sustainable Finance (SF) and Green Finance (GF) by Banks**

This study investigates the loan disbursement by banks in SF and GF for Q4, 2023, separately and exhibits a summary for the whole year 2023. Charts Nos. 9 and 10 show a glimpse of SF and GF by banks from January to December 2023.

Target Attainment is Disbursement in SF ≥ 20% of total loan disbursement

Chart 3: Sustainable Finance of Q4, 2023 of different commercial banks

Chart 3 shows that only 17 commercial banks fulfil the sustainable financing target SF ≥20% of total term loan disbursement set by Bangladesh Bank. The chart shows that in Q4, 2023, 17 banks out of 61 had exposure to green finance, where 16 PCBs were seen. Among them, Bangladesh Krishi Bank stood in the top position at 56.48%, next to NRB Commercial Bank PLC at 42.86%, BRAC Bank PLC at 41.32%, and Jamuna Bank PLC stood last at 21.57%.

**11.5 Target Attainment green finance Up to Q4, 2023**

Chart 4: Green Finance of Q4, 2023 of different commercial banks

Chart 4 shows that only 22 commercial banks fulfil the GF ≥5% of the total term loan disbursement set by Bangladesh Bank. The chart shows that in Q4, 2023, 22 banks out of 61 had exposure to green finance, where only PCBs were seen. UCB PLC held the top position, holding 36.21%, followed by Jamuna Bank PLC at 29.85%, IBBL PLC at 22.42%, and Bank Asia stood last at 5.47%.

**11.6 Table 3: Comparison table of GF and SF (in %) for the year 2023**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | GF2023 | |  |  |  | SF 2023 | |  |  |  |
| Banks | Q1 | Q2 | | Q3 | Q4 | Q1 |  | Q2 Q3 | | Q4 |
| SOCBs (06) | 1.07 | 0.93 | | 1.04 | 1.64 | 5.64 | | 8.47 | 4.75 | 6.10 |
| SDBs (03) | 0.16 | 0.09 | | 0.02 | 0.08 | 54.43 | | 51.59 | 43.07 | 18.88 |
| PCBs (43) | 4.81 | 5.93 | | 8.71 | 11.37 | 14.12 | | 12.94 | 13.07 | 40.01 |
| FCBs (09) | 1.34 | 4.93 | | 1.78 | 7.45 | 9.83 | | 10.39 | 10.48 | 16.99 |
| Bank's Total | 4.16 | 5.30 | | 7.15 | 9.09 | 13.59 | | 12.99 | 12.72 | 27.24 |

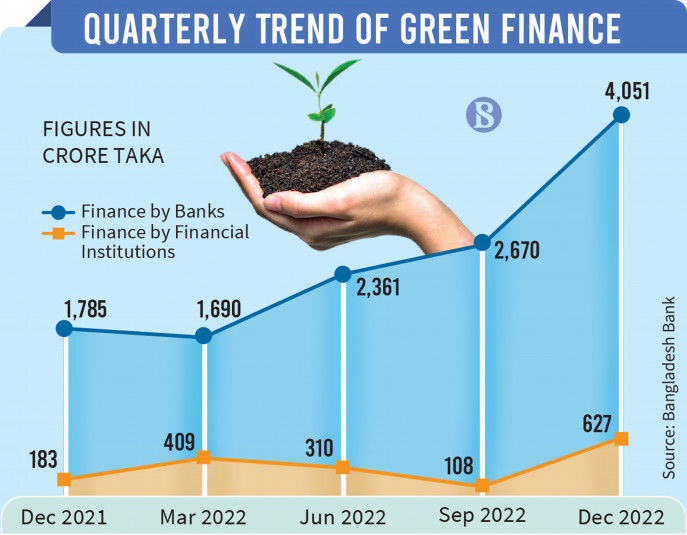
Table 3 indicates a complete bank’s target attainment in 2023 regarding green finance and sustainable finance regarding bank types. The table suggests 43 banks’ green and sustainable finance exposure in 2023. The table shows that Q4 target attainment was 9.09% in GF, while SF was 27.24%. The Bangladesh bank fixed the target for 2021. PCBs were the highest at 11.37%, and SOCBs were the lowest at 1.64% in GF, while in SF, PCBs also achieved the highest at 40.01% and the weakest SOCBs at 6.10%.

**11.7 Table 4 Category-wise GF (in million BDT) in 2023**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Green Finance (IV) | SOCBs(06) | SDBs(03) | PCBs(43) | FCBs(09) |
| 1. Renewable Energy (RE) | 2.9 | 9.04 | 473.84 | 0 |
| 2. Energy Efficiency (EE) | 1,78 | 0 | 15379.29 | 751 |
| 3. Alternative Energy (AE) | 0 | 0 | 2 | 0 |
| 4. Liquid Waste Management (LWM) | 0 | 0 | 727.7 | 0 |
| 5. Solid Waste Management (SWM) | 0 | 0 | 0 | 0 |
| 6. Recycling & Manufacturing of Recycling Goods RMRG) | 10.23 | 0 | 3441.18 | 3.42 |
| 7.Environment-friendly Brick Production (EFP) | 691.56 | 0 | 409.99 | 0 |
| 8. Green Environment Friendly Establishments (GEFE) | 0 | 0 | 10009..1 | 0 |
| 9. Green Agriculture | 374.1 | 1.71 | 632.29 | 0.1 |
| 10. Green CMSME | 622 | 0 | 1058.11 | 0 |
| 11. Green SRF | 820.31 | 0 | 12414.02 | 465.33 |

# Table 4 shows that SOCBs invest highest in Green SRF 820.31, SDBs in renewable energy 9.04, PCBs in Energy efficiency 15379.29 and FCBs in green SRF 465.33 million BDT respectfully.

# **11.8 Green finance allotment rises 127% in December Quarter, 2022**



**Chart 5: GF trend December 2021 to December 2022**

**Loans to green industries and projects, popularly known as green finance, increased to Tk. 4,678 crore in the October-December quarter of 2022, up 127% compared to that of the previous year, according to the latest BB report.** The banks and financial institutions achieved the target in all four quarters of 2022.

**11.9** **Bank-wise target achieved GF and SF in Bangladesh**

Chart 6: Target achieved by banks in GF and SF categorically in 2023

The chart 6 indicates 61 banks’ exposure to green finance and sustainable finance in 2023 at a glance where PCBs green finance is 11.37% and sustainable finance is 40.01% hold the highest position in Q4.

**11.10 Table 5: Sector-wise GF by banks in 2023 (in million Tk.)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub Category/Product Name | Q1 | Q2 | Q3 | Q4 |
| 1. Establishment of Green Industry | 0 | 0 | 0 | 9.93 |
| 2. Solar Home System (SHS) | 0 | 0 | 1.67 | 1.13 |
| 3. Integrated Cow Rearing and Setting Up of Bio-gas Plant | 0 | 0 | 0 | 0.8 |
| 4. Production of Vermicomposting | 0 | 0 | 0.94 | 1.74 |
| 5. Establishment of Certified Green Building | 255 | 0 | 0 | 0 |
| 6. Safety and working Environment of Factory related | 7.03 | 16.08 | 7.03 | 8.8 |
| 7. Combination of Biological and Chemical ETP | 0 | 7.1 | 14.13 | 4.47 |
| 8. Foam Concrete Brick | 0 | 150 | 0 | 0 |
| 9. Compressed Block Brick | 0 | 0 | 0 | 0 |
| 10. PET Bottle Recycling Plant | 0 | 0 | 0 | 0 |
| 11. Installation of Machineries (Energy Auditor Certified) | 0 | 0 | 176.99 | 289.34 |
| 12. Energy Efficiency Technology | 0 | 0 | 0 | 110.23 |
| 13. Environment-Friendly/Brick Kiln Project | 0 | 0 | 319 | 0 |

Table 5 shows, Installation of Machineries (Energy Auditor Certified) is 289.34 million BDT the highest investment, next to Energy Efficiency Technology is 110.23, Establishment of Green Industry is 9.93, Safety and working Environment of Factory related is 8.8 and Combination of Biological and Chemical ETP is 4.47 respectfully.

**11.11 Digital Payment by Banks (Billion in BDT) in Bangladesh**

Table 6: Banking sector performance (by digital payment)

|  |  |  |  |
| --- | --- | --- | --- |
| Item | FY-2021 | FY-2022 | FY-2023 |
| ATM Transaction | 1585.7 | 2985.5 | 4332.1 |
| POS Transaction | 171.9 | 226.6 | 296.4 |
| E-Commerce Transaction | 77.6 | 88 | 130.6 |
| Internet Banking Fund Transfer (IBFT) | 98.6 | 335.4 | 880.3 |
| BEFTN (Debit) | 631.5 | 974 | 1312.6 |
| BEFTN (Credit) | 3774.4 | 4954.1 | 5568.6 |

Table 6 shows last three year digital payment by banks where every digital payment grows upper trend.

**11.12 Table 7: Sustainability Ranking of Banks**



Bangladesh Bank declared sustainable banks based on four indicators in the Sustainable Ratings of 2020, 2021, and 2022, such as i) SF, ii) GF, iii) CSR activities, and iv) Core banking sustainability. That is (2022) the 3rd time BB announced bank sustainability ratings. In two years, we realized we had considered and attached all three core values of people, planet, and prosperity to sustainability as our bank's mission statement. Now, BRAC bank follows impact-based funding instead of conventional financing to achieve the SDG 17 goals in Bangladesh. He also noted that as a founding member of the global alliance for Banking on Values, we use 360-degree banking services to provide an endurable monetary, environmental, and social transition. "As one of the founding members of the Global Alliance for Banking on Values, we are utilizing 360-degree banking services to deliver sustainable economic, social, and environmental development. Our corporate social initiatives are also focused heavily on agendas that have an ongoing influence on the environment, society, and its people," Hussain remarked. "On the principles of sustainability, BRAC Bank seeks to employ the guiding regulations of Bangladesh Bank and set sustainable growth priorities in our future strategy. We are honored that Bangladesh Bank has named us one of the Top Ten Sustainable Banks for 2021," he added. Executive director and spokesperson of Bangladesh Bank, Md Serajul Islam, said that the top 10 banks in the sustainability rating list were published to motivate the banks to uphold good governance, integrity, and social responsibility. Asked about the indicators and the views of some central bank divisions in assembling the list, he told Dhaka Tribune: "Sustainability ratings are founded on several indicators, including CSR spending, GF, core banking moves, and default rate. “Hopefully, this rating will boost the formation of virtue and good governance in the actions of banks and FIs. In addition, Islam added that CSR will play a more pioneering role in spending and GF. The top 10 sustainable banks were reported for the first time in 2020. ttps://www.dhakatribune.com/273013

**11.13 In-House Year-wise GB Initiatives by Banks in Bangladesh**

Table 8: In-house green banking activities

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Q4** | **2023** |  |  |  |
| Activities | SOCBs | SDBs | PCBs | FCBs | Bank's total |
| 1. Number of Branches | 3835 | 1541 | 4217 | 69 | 9662 |
| 2. Number of Branches Powered by Solar Energy | 80 | 0 | 339 | 8 | 427 |
| 3. Number of Branches with rainwater harvest. | 0 | 0 | 4 | 1 | 5 |
| 4. Number of Branches with solid waste mgt. | 0 | 0 | 1395 | 6 | 1401 |
| 5. Number of ATM Booths | 451 | 9 | 6680 | 88 | 7228 |
| 6. Number of ATM Booths Powered by Solar Energy | 571 | 0 | 142 | 4 | 717 |
| 7. Number of Agent Outlets | 793 | 0 | 19721 | 0 | 20514 |
| 8. Number of Solar Powered Agent Outlets | 0 | 0 | 30 | 0 | 30 |
| 9. Number of Accounts using Internet Banking | 181019 | 439032 | 3310700 | 313759 | 4244510 |
| 10. Number of Accounts using SMART Phone | 335164 | 437042 | 19507461 | 199279 | 20478946 |
| 11. Number of Online Branches | 3835 | 1421 | 4139 | 56 | 9451 |
| 12. Total Number of MFS Accounts | 0 | 0 | 124981224 | 0 | 124981224 |

Source: Researcher accumulation from sustainable development report BB.

Table 8 shows that out of 9662 branches PCBs owned the highest 4217 branches followed by SOCBs 2835, SDBs 1541, and FCBs 69 branches functioning in Bangladesh. But unfortunately, SDBs have no branches powered by solar energy. PCBs have the highest 339, SOCBs have 80 and FCBs have only 8 branches powered by solar energy. In respect of ATM booths, SOCBs have the highest 571, followed by PCBs have 142, FCBs have 4 and SDBs have 0 ATM booths powered by solar energy. In respect of the Number of Accounts using Internet Banking PCBs have the highest 3310700, followed by SDBs have 439032, FCBs have 313759, and SOCBs have 181019. In the same way, the smartphone users owned 19507461 accounts in PCBs, next to 437042 in SDBs, 335164 in SOCBs, and 199279 in FCBs respectively. PCBs are also in the highest position holding 4139 branches operating full-fledged online transactions, followed by SOCBs 3835, SDBs 1421, and FCBs 56 branches. Finally, PCBs have 124981224 MFS accounts whereas other banks have none. Till 2023 Quarter 3, About 45 banks and 8 financial institutions arranged training & awareness programs concerning sustainable and green financing activities. A snapshot of the Q3, 2023 period on the topic is given below:

**11.14 Training, Awareness, and Capacity Building**

**Table 9: Training, Awareness, and Capacity Building of Green Banking Activities**

|  |  |  |  |
| --- | --- | --- | --- |
| 2023 |  |  |  |
| Types of Banks | No. of Programs | No. of Employees | No. of Customers |
| SOCBs | 59 | 1108 | 0 |
| SDBs | 1 | 40 | 0 |
| PCBs | 149 | 5886 | 61 |
| FCBs | 46 | 973 | 10 |
| Total | 255 | 8007 | 71 |

Source: Researcher accumulation from sustainable development report of Bangladesh Bank.

Table 17 shows banks’ in-house training, awareness, and capacity-building arrangement on green banking activities in Q3, 2023. SOCBs arranged 59 programs; 1108 staff attended, and no clients attended. SDBs arranged only one program participated, 40 employees, and no customers attended. PCBs arranged the highest number of 149 programs, with 5886 employees and had the highest number of 61 clients. Finally, FCB arranged 46 programs that delegated 973 to 10 customers.

**12. Findings**

a) Out of 61 only 22 commercial banks fulfill the GF ≥5% target of total term loan disbursement set by Bangladesh Bank. Among them, UCB PLC held the top position, at 36.21%, followed by Jamuna Bank PLC at 29.85%, IBBL PLC at 22.42%, and Bank Asia in the last position at 5.47%.

b) On the other hand, only 17 commercial banks fulfill the sustainable financing target SF ≥20% of the total term loan disbursement set by Bangladesh Bank. In Q4, 2023, 17 banks out of 61 had exposure to green finance, whereas 16 banks were PCBs. Only Bangladesh Krishi Bank (SDBs) occupied the top position, accounting for 56.48% of sustainable finance. Next to NRB Commercial Bank PLC 42.86%, BRAC Bank PLC 41.32%, etc., and Jamuna Bank PLC stood last position at 21.57%.

c) The study also found the total target achieved by banks was 9.09% in GF of the total loan disbursement and 27.24% in SF, which exceeded the target set by the central bank of Bangladesh.

d) PCBs green finance is 11.37% and sustainable finance is 40.01% hold the highest position in Q4, 2023.

**13. This research reveals the following Suggestions**

1. Banks should not invest in ecologically hostile projects,.
2. Bangladesh bank should strictly start environmental governance with financial institutions.
3. Bangladesh bank should take feedback from banks and other stakeholders as a routine work.
4. Banks should arrange capacity-building programs among employees at the branch level as head office.
5. Bangladesh bank should announce the punishment and reward policies regarding green banking performance.
6. The government can offer tax waivers or subsidies on green financing projects to promote green banking for greater interest.

**14. Conclusion**

Bangladesh is a defenseless country regarding environmental transformation risk, so it should move onward by integrating green financing projects into conventional investment. BB has also familiarized itself with several policy choices for social, economic, and environmental safeguards for financial institutions to follow while disbursing loans.  Bangladesh is facing severe environmental degradation due to the destruction of water bodies, exhaustion of soil nutrients, massive air and water pollution, indiscriminate cutting of trees, improper dumping of business effluent, medical left-over, household garbage, damage of biodiversity, decrease of sweeping spaces, etc. as corporate citizenship commercial banks have a unique part and social concern in enhancing government endeavors towards environmental pollution. The motto of financial institutions is to minimize legal risk, credit risk, and reputation risk, and maximize profit.  Bangladesh Bank has set some slogans regarding green banking as i) kick the habit, be paperless ii) save paper, save trees iii) save energy, save natural possessions iv) pay our bills online v) always use cloth bags, avoid polythene vi) reduce, reuse, recycle vii) digitize yourself.By successfully implementing the challenges of Digital Bangladesh by 2021, the nation is directed to make another dream, SMART Bangladesh, consisting of four pillars: i) SMART Citizen, ii) SMART Economy, iii) SMART Government, and iv) SMART Society. In line with Vision 2021, we are now standing in the era of SMART banking, which leads us to green financing and a triple-bottom-line approach (People, Profit, and Planet). The smartphone on the plume of a client using E-Wallet and QR code facilities represents innovative banking tools and techniques invented and provided by banks. The bank's top position depends on the sparkle on the line of electronics wave and present digital advancements and financial performance. In 2011, Bangladesh Bank launched formal actions toward greening financial activities and issued several circulars, guidelines, and policies as a controlling authority of the economic sectors. The study observed that, unfortunately, not all banks are aware of green banking and did not disclose the green financing activities as per Bangladesh bank guidelines. Based on the entity concept, all banks are global residents, and they trust every minor green step can build a greener future and make the planet green and habitable for all creatures.

**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.

Akhter, I., Yasmin, S., & Faria, N. (2021). Green banking practices and its implication on financial performance of the commercial banks in Bangladesh. Journal of Business Administration, 42(1), 1-23.

Alam, M. A., & Islam, T. (2023). Factors Affecting Performance of SMEs: A Study on Satkhira District of Bangladesh. NOLEGEIN Journal of Financial Planning & Management, 6(2), 19-32p.

Alam, M.A., & Shaikh, M. A. H. (2023). Impact of Some Selected Determinants on SMEs Performance: A Study on Jhenaidah District of Bangladesh. Archives of Business Research,11(9). 92-108.

Alam, M. A. et al., (2024). Green Banking Status and Climate Change: Bangladesh Perspective. Research Journal of Finance and Accounting, 2024, vol. 15, No. 5. p (10-32) DOI: 10.7176/RJFA/15-5-02

Appah, E., Tebepah, S. F., & Eburunobi, E. O. (2024). Green Banking Practices and Green Financing of Listed Deposit Money Banks in Nigeria. British Journal of Multidisciplinary and Advanced Studies, 5(1), 41-73.

Al-Amin, S. (2022). Green management in SMEs of Bangladesh: Present scenario, implementation obstacles and policy options. American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS), 85(1), 278-286.

Aubhi, R.U. (2016). The evaluation of green banking practices in Bangladesh. Research Journal of Finance and Accounting, 7(7).

Azad, M. A. K; Islam, M. A., Sobhani, F. A., Hassan, M. S., & Masukujjaman, M. (2022). Revisiting the current status of green finance and sustainable finance disbursement: A policy insights. Sustainability, 14(14), 8911. https://doi.org/10.3390/su14148911

Bariweni, B. (2024). Corporate Social Responsibility and Financial Performance of Quoted Oil and Gas Companies in Nigeria. British Journal of Multidisciplinary and Advanced Studies,5(1), 74-89.

Bose, S., Khan, H. Z., Rashid, A., & Islam, S. (2018). What drives green banking disclosure? An institutional and corporate governance perspective. Asia Pacific Journal of Management, 35, 501-527.

Choudhury, T. T., Salim, M., Al Bashir, M. M., & Saha, P. (2013). Influence of stakeholders in developing green banking products in Bangladesh. Research Journal of Finance and Accounting, 67-77.

Chowdhury, T. A., Kabir, T., & Chowdhury, T. A. (2022). Performance Evaluation of Selected Islamic Banks in Bangladesh. Asian Economic and Financial Review, 12(6), 397-419.

Deb, B. C., Saha, S., Rahman, M. M., & Green, D. “DOES GREEM ACCOUNTING PRACTICE AFFECT BANK PERFORMANCE? A STUDY ON LISTED BANKS OF DHAKA STOKE EXCHANGE IN BANGLADESH.

Ellahi, A., Jilani, H., & Zahid, H. (2023). Customer awareness on Green banking practices. Journal of Sustainable Finance & Investment, 13(3), 1377-1393.

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.

Fatima, T., Karim, M. Z. abd, & Meo, M. S. (2020). Sectoral CO2 emissions in China: asymmetric and time-varying analysis. *Journal of Environmental Planning and Management*, *64*(4), 581–610. https://doi.org/10.1080/09640568.2020.1776691

Felix, T. S. (2022). CORPORATE GOVERNANCE MECHANISMS AND FINANCIAL PERFORMANCE OF LISTED COMPANIES IN NIGERIA.

Gunawan, J., Permatasari, P., & Sharma, U. (2022). Exploring sustainability and green banking disclosures: a study of banking sector. Environment, Development and Sustainability,24(9), 11153-11194.

Hassan, M. K., & Rahman, M. A. (2023). Green Banking: Present Status and Prospect-A Study on Bangladesh. Development, 13(02).

Hasan, M. M., Al Amin, M., Moon, Z. K., & Afrin, F. (2022). Role of environmental sustainability, psychological and managerial supports for determining bankers’ green banking usage behavior: an integrated framework. Psychological research and behavior management, 3751-3733.

Hossain, M. (2018). Green finance in Bangladesh: policies, institutions, and challenges (No. 892). ADBI Working Paper, 1-24.

Hossain, D. M., Bir, A. T. S. A., Sadiq, A. T., Tarique, K. M., & Momen, A. (2016). Disclosure of green banking issues in theannual reports: a study on Bangladeshi Banks. Middle East Journal of Business, 11(1), 19-30.

Hassan, U. O., Mberia, H. K., & Muturi, W. (2017). Effect of working capital management on firm’financial performance: A survey of water processing firms in Puntland. International Journal of Economics, Commerce and Management, 31(2), 106-119.

Herath, H. M. K., & Herath, H. M. S. P. (2019). Impact of Green banking initiatives on customer satisfaction: A conceptual model of customer satisfaction on green banking. Journal of business and Management, 1(21), 24-35.

Hoque, M. K., Masum, M. H., & Babu, M. A. (2022). Impact of financial performance on green banking disclosure: Evidence from the listed banking companies in Bangladesh. Universal Journal of Accounting and Finance, 10(2), 450-456.

Hossain, M. A., Rahman, M. M., Hossain, M. S., & Karim, M. R. (2020). The effect of green banking practices on financial performance of listed banking companies in Bangladesh. Canadian Journal of Business and Information Studies, 2(6), 120-128.

Hossain, S. Z., & Rana, Md. S. (2024). Effects of Ownership Structure on Intellectual Capital: Evidence from Publicly Listed Banks in Bangladesh. *Journal of Risk and Financial Management*, *17*(6), 222. https://doi.org/10.3390/jrfm17060222

Huq, S. (2008). Climate change impacts and responses in Bangladesh.

Ikram, U., & Akhtar, S. (2021). Green Banking, Corporate Governance and Performance of Selected SAARC Countries. Review of Economics and Development Studies, 7(4), 543-559.

Islam, A. (2018). Green banking and its challenges and practice in Bangladesh. International Journal of Science and Research Methodology, Human Journal, 10(2), 18-27.

Islam, M. A., Yousuf, S., Hossain, K. F., & Islam, M. R. (2014). Green financing in Bangladesh: challenges and opportunities-a descriptive approach. International Journal of green economics, 8(1), 74-91.

Islam, S. F., & Hossain, S. Z. (2022). Eco-affecting Reporting Practices of Publicly Traded Engineering Companies in Bangladesh. Journal of Environmental Accounting and Management, 10(2), 157-175.

Islam, M.S., & Rana, M. (2022). The Influence of Credit Risk Management Indicators on Profitability Attributes: Empirical evidence from state-owned Commercial Banks in Bangladesh. Journal of Business Studies, 3(1), 43-60.

Islam, M. A., Avi, M. R., & Ashanuzzaman, M. (2022). Assessing the Impact of Liquidity on Profitability: Specific to the Banking Industry of Bangladesh.

Islam, M. N., Akter, A., Alam, M. J., & Shahriar, A. H. M. (2020). Analyzing how credit risk influences the performance of commercial banks in Bangladesh: A quantile regression modeling. International Journal of banking, risk and insurance, 8(2), 14-26.

Jatan, R., & Jain, H. (2020). Green banking and profitability: An empirical study of Indian commercial banks. Sumedha Journal of Management, 9(2), 14-27.

Julia, T., Noor, A. M., & Kassim, S. (2020). Islamic social finance and green finance to achieve SDGs through minimizing post harvesting losses in Bangladesh. Journal of Islamic Finance, 9(2),119-128.

Karim, M. R., & Mitra, R. K. (2018). A Trend Analysis of Green Banking Practices in Bangladesh. The Cost and Management, 46(1), 3-11.

Khairunnessa, F., Vazquez-Brust, D. A., & Yakovleva N. (2021). A review of the recent development of green banking in Bangladesh. Sustainability, 13(4), 1904.

Khan, I. U., Hameed, Z., Khan, S. U., & Khan, M. A. (2023). Green banking practices, bank reputation, and environmental awareness: evidence from Islamic banks in a developing economy. Environment, Development and Sustainability, 1-21.

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.

Lalon, R. M. (2015). Green banking: Going green. International Journal of Economics, finance and management sciences, 3(1), 34-42.

Mcharo, R. O., & Cobbinah, B. B. (2022). A Research on the Impact of Corporate Social Responsibility on the performance of an Organization: An Empirical Study of the Banking Sector in Tanzania. Open Journal of Business and Management, 10(6), 3531-3563.

Masukujjaman, M., Siwar, C., Mahmud, M. R., & Alam, S. S. (2016). Bankers’ perception of Green Banking: Learning from the experience of Islamic banks in Bangladesh. Geografia,12(2).

Mawla, A. R., & Khanam, F. A. (2018). Performance Evaluation of Islamic Banks in Banks in Bangladesh-A Statistical Analysis. Performance Evaluation, 10(36).

Moon, Z. K., & Hasan, M. M. (2022). Impact of COVID-19 on green financial practices of banks and financial institutions in Bangladesh. Journal of Business and Social Sciences Research, 7(1), 21-40.

Mohabbat, N., Rahman, K., & Darda, A. (2018). Tax Avoidance and Evasion Practices in Bangladesh: A Study on Dhaka City. Research Journal of Finance and Accounting, 98.

Mir, A. A., & Bhat, A. A. (2022). Green banking and sustainability-a review. Arab Gulf Journal of Scientific Research, 40(3), 247-263.

Nabi, M. G., Khan, M. M. R., Islam, M. S., & Uddin, M. J. (2016). Are We Greening the Economy? Recent Trends of Green Financing in Bangladesh (No. 1618). Working Paper Series: WP.

Ngware, S. G., & Muluka, K. O. effect of Deposits Portfolio on the Financial Performance of Commercial Banks in Kenya.

Onaolapo, A.R., & Olanrewaju, J.D. (2024). Impact of Accounting Information System (AIS) Expenditure On Financial Performance of Selected Nigerian Deposit Money Banks (NDMBS) (2007-2022). British Journal of Multidisciplinary and Advanced Studies, 5(1), 131-141.

Rahman, M. H., Rahman, J., Tanchangya, T., & Esquivias, M. A. (2023). Green banking initiatives and sustainability: A comparative analysis between Bangladesh and India. Research in Globalization, 100184.

Rahman, M. M., Hoque, M. S., & Roy, M. (2018). Green Financing and Its Impact on Profitability of the Banks: An Empirical Study on Banking Sector of Bangladesh. Metropolitan University Journal, 6.

Rahman, F., & Perves, M. M. (2016). Green banking activities in Bangladesh: An analysis and summary of initiatives of Bangladesh Bank. Research Journal of Finance and Accounting, 7(10), 6-7.

Rasul, U. S. M., & Abadin, S. S. Sustainable Banking: Analyzing Pattern of Green Banking in Bangladesh.

Ashid, M. H. U., & Uddin, M. M. (2018). Green financing for sustainability: analyzing the trends with challenges and prospects in the context of Bangladesh. International Journal of Green Economics, 12(3-4), 192-208.

Raisa, T. S., & Maria, A. N. (2019). Performance of green banking and its effect on economy in Bangladesh. International Journal of Advanced Research, Ideas and Innovations in Technology, 5(1), 58-66.

Rana, Md. S., & Hossain, S. Z. (2023). Intellectual Capital Valuation of DSE-Listed Non-financial Companies in Bangladesh. *Archives of Business Research*, *11*(10), 129–144. https://doi.org/10.14738/abr.1110.15468

Rehman, A., Ullah, I., Afridi, F. E. A., Ullah, Z., Zeeshan, M., Hussain, A., & Rahman, H. U. (2021). Adoption of green banking practices and environmental performance in Pakistan: A demonstration of structural equation modelling. Environment, Development and Sustainability, 1-21.

Redwanuzzaman, M. (2000). The Determinants of green banking adoption in Bangladesh: An environmental perspective. Business Review, 15(1), 18-26.

Rehman, A., Ullah, I., Afridi, F, E, A., Ullah, Z., Zeeshan, M., Hussain, A., & Rahman, H. U. (2021). Adoption of green banking practices and environmental performance in Pakistan: A demonstration of structural equation modelling. Environment, Development and Sustainability, 1-21.

Ruiz, J. G., Arboleda, C. A., & Botero, S. (2016). A proposal for green financing as a mechanism to increase private participation in sustainable water infrastructure systems: The Colombia Case. Procedia Engineering, 145, 180-187.

Shahriar, A. H. M., Alam, M.J., Biswas, A. A., Rumaly, N., & Golder, U. (2021). Factors shaping capital structure: evidence from private commercial banks in Bangladesh. International Journal of Accounting & Finance Review, 9(1), 1-16.

Shaumya, K., & Arulrajah, A. (2016, December). Measuring green banking practices: Evidence from Srilanka. In University of Sir Jayewardenepura, Sri Lanka, 13th International Conference on Business Management (ICBM).

Shakil, M. H., Azam, M. K. G., & Raju, M. S. H. (2014). An evaluation of green banking practices in Bangladesh. European Journal of Business and Management, 6(31), 8-16.

Sharma, M., & Choubey, A. (2022). Green banking initiatives: a qualitative study on Indian banking sector. Environment, Development and Sustainability, 24(1), 293-319.

SIDDIK, A.B. Sustainability Reporting on Green Financing: A Study of Listed Private Commercial Banks in Bangladesh.

Sohel Rana, Md., & Hossain, S. Z. (2023). Intellectual Capital, Firm Performance, and Sustainable Growth: A Study on DSE-Listed Nonfinancial Companies in Bangladesh. *Sustainability*, *15*(9), 7206. https://doi.org/10.3390/su15097206

Taluka, S., Verma, S., & Sharma, J. (2022). BOARD MEETING FREQUENCY AND PERFORMANCE OF PUBLIC SECTOR BANKS IN INDIA. Indian Journal of Finance and Banking, 11(1), 38-44.

Tu, T. T. T.; (2017). Factors affecting green banking practices: Exploratory factor analysis on Vietnamese banks. Journal of Economic Development, 2017, 24, 04-30. [CrossRef]

Uddin, M. N., Kassim, S., Hamdan, H., Saad, N. B. M., & Embi, N. A. C. (2021). Green microfinance promoting sustainable development goals (SDGs) in Bangladesh. Journal of Islamic Finance, 10, 011-018.

Uddin, M. N. (2016). ‘Sharia’ah’based banking and green financing: evidence from Bangladesh. Journal of Emerging Economies and Islamic Research, 4(2), 1-22.

Yasmin, S., & Akhter, I. (2021). Determinants of Green Credit and Its Influencing on Bank Performance in Bangladesh. International Journal of Business, Economics and Law, 25(2), 31-41.

Zhang, X., Wang, Z., Zhong, X., Yang, S., & Siddik, A. B. (2022). DO green banking activities improve the banks’ environment performance? The mediating effect of green financing. Sustainability, 14(2), 989.

Zheng, G.-W., Siddik, A. B., Masukujjaman, M., & Fatema, N. (2021). Factors affecting the sustainability performance of financial institution in Bangladesh: the role of green finance. Sustainability, 13(18), 10165. https://doi.org/10.3390/su131810165

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.