

Research Article

# Status of Green Financing and Sustainable Financing: Bangladesh Context

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## Abstract

Almost all banks established green banking units in time, though there is a lack of seriousness in implementing green banking guidelines set by Bangladesh Bank. In the present situation, climate change, sustainability, environment, etc., have become major global concerns. There is no other planet in the universe for human beings and other animal habitats with ecological harmony. This study aims to examine the green financing (GF) and sustainable financing (SF) status and role of central bank in Bangladesh. This study gathered mainly secondary data from Bangladesh Bank (BB) website in 2023 and 2024 and used MS-excel software for tabulating, analyzing and comparing results. This study finds 22 banks achieved GF target where UCB 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 SF 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 GF and 27.24% in SF, which exceeded the target set by the Bangladesh bank and it is a milestone to achieve SDGs set by the united nations (UN) by 2030.

## Keywords

Status, Bangladesh Bank, Green Financing, Sustainable Financing, Refinancing, Environment

## 1. Introduction

Bangladesh, an emerging country, is one of the most polluted countries in the universe. To protect our severely affected country and the next generation, we need to take some initiatives, such as creating pressure on the international community to reduce CO<sub>2</sub> emissions and take decisive steps against our internal polluters. Bangladesh is considered a developing economy; managing its environment requires focusing on the business fraternity, especially in the banking sector [1]. This sector needs to address ecological and social

hazards linked with funding exercises which 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

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**Received:** 27 September 2024; **Accepted:** 25 October 2024; **Published:** 9 December 2024



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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. Green banking 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. Reference [2] mentioned green banking works like a wheel as a linked chain as shown in figure 1.

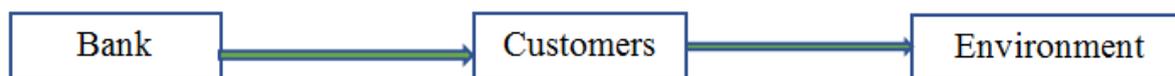


Figure 1. Relationship among Bank, Customers and Environment.

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 banking 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 CO<sub>2</sub> into the air. Thus, it is evident that human beings are causing more conservatory gases like CO<sub>2</sub> 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 [3, 4]. This loss of woodlands causes double concerns, such as fumed-up trees emitting significant volumes of CO<sub>2</sub> into the air. On the other hand, as forests absorb much CO<sub>2</sub> 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.

### 2.1. Statement of the Problem

A pollution-free green planet is required for the healthy living of human beings and the survival of other species. 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. 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. Now is the time to examine, evaluate, and take the correct initiatives to protect environmental pollution. This research will help to depict the complete scenario of environmental pollution and how commercial banks can contribute to overcoming the versatile problem. 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.

## 2.2. 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 decarbonization 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 reference [5] 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 Km<sup>2</sup> 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 terri-

tory of 20000 km<sup>2</sup> 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 reference [6] 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. For reference, in the first half of 2022, solar power saved \$ 34 billion, or around 9% of the total fossil fuel expenditures of China, Japan, South Korea, Vietnam, the Philippines, and Thailand. Solar power could have reduced Bangladesh's spot LNG purchased by 25% and saved \$2.7 billion by 2024. The reference [7] 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, CO<sub>2</sub> 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 CO<sub>2</sub> into the air. Therefore, we generate substantial greenhouse gases all over the world.

## 2.3. Research Questions

The research questions in the study is i) what are the present status of green financing and sustainable financing implemented by scheduled banks in Bangladesh? ii) what are the position of commercial banks regarding green financing and sustainable financing in Bangladesh?

## 2.4. Objectives of the Study

This study aims to depict the green banking scenario of financial institutions in Bangladesh. The specific objectives of the study are:

To examine the present status of green financing and sustainable financing in Bangladesh.

## 2.5. Limitations of the Study

First, this study entirely depends on secondary data. Second, this study only deals with the banking sectors in Bangladesh. Third, this study only deals with the banking sectors in

Bangladesh and sincerely avoid non-bank financial institutions. Finally, no modern statistical tools like SPSS, STATA and EVIEWS etc. statistical tools were used to interpret the data.

## 3. Review of Literature

*Table 1. Literature review summary.*

| SL | Author, Year, and Country                               | Study Objectives   | Methods   | Variables   | Findings   | Ref. |
|----|---|--|---|---|--|------|
| 1  | Zeng et al. (2022), China                               | 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 were:<br>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.   | [8]  |
| 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 were i. Command, control and environmental regulation ii. Marketing incentives environmental regulation iii. green finance             | 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.        | [9]  |
| 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  | [10] |
| 4. | Jatana, R., & Jain, H. (2020), India                    | i. to investigate the effect of GB on bank performance.  | Secondary data was used.  | The independent variable were 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   | [11] |
| 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 analysed. SPSS software was used for data interpretation.  | The independent variable were 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. | [12] |
| 6  | Islam, M. A., Avi, M. A. R., & Ashanuzzaman, M. (2022). | i. to examine the liquidity position on the profitability  | 10 years secondary data from five banks and OLS model is  | IV is Loan-Deposit ratio, Deposit-Asset ratio and Cash-deposit  | Liquidity ratio would escalate the ROA.  | [13] |

| SL | Author, Year, and Country   | Study Objectives   | Methods  | Variables   | Findings   | Ref. |
|----|---|--|--|---|--|------|
| 7  | Sharma, M., & Choubey, A. (2021), India                                 | of banks.<br><br>i. Conceptual model was applied in GB initiatives.<br>ii. To show the green banking indicators impacts on possible outcomes.                | used.<br><br>Exploratory and qualitative methods based on multiple case studies. They used primary and secondary data.         | ratio.<br><br>DV is ROA<br><br>Three independent variables were i. green banking initiatives ii. green brand image iii. green bond trust.                   | i. The set target was not achieved.<br>ii. 63% of total respondent were bank indulges in development of different green products, 53% bankers told incorporate green internal process and 60% believe GB have positive role in restoring customer trust.   | [14] |
| 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 were: 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  | [15] |
| 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 analyse data. | The independent variable were i. Economic ii. Social and iii. environmental dimensions.   | i. The economic dimension has positive and significant impact on the sustainability performance of PCBs.<br>ii. The social dimensions positively and significantly impact on sustainability performance of PCBs.<br>iii. The environmental dimension have positive and significant impact on the sustainability performance of PCBs. | [16] |
| 10 | 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 analysed using STATA 14.2. They used econometric model   | The independent variable were 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  | [17] |
| 11 | Akomea, F, I., Adeabah, D., Ofori, D., & Tenakwah, E. J. (2022), China. | i. to analyse 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.   | [18] |
| 12 | 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:<br>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.<br>ii. green banking undoubtedly benefits banks, industries, and the environment to some extent.  | [19] |
| 13 | Khatun, M. N.,  | i. to explore the  | The research was   | The independent var-  | i. Most of the PCBs and FCBs   | [20] |

| SL | Author, Year, and Country  | Study Objectives   | Methods  | Variables  | Findings   | Ref. |
|----|--|--|--|--|--|------|
|    | Sarker, M. N. I., & Mitra, S. (2021) Bangladesh                                | pattern adopted by green banking activities in Bangladeshi banks.  | based on secondary data between (2014-2019). Quantitative method was adopted to interpret data.                              | variable was - various green banking initiatives and dependent variable was - sustainable development.   | adopted green banking policies<br>ii. PCBs disbursed the highest loans to environmentally convenient projects followed by FCBs and SOCBs.  |      |
| 14 | 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 analyse 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.<br>ii. The dimensions of GF- social, environmental, and economic – have a positive effect on the sustainability performance of banks.<br>iii. About 95% of bankers thought GF is an important element in banking sectors' short-term and long-term development. | [21] |
| 15 | 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.  | [22] |
| 17 | Taluka, 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 analysed.  | The independent variable was ROA and IV were 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.  | [23] |
| 18 | Walzer, M., Tamimi, A. H. A., & Firman-syah, 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<br>ii. the efficiency ratio<br>iii. non -performing loans<br>iv. loan to deposit ratio | i. The capital adequacy ratio and efficiency ratio negatively impacted bank profitability.<br>ii. Non-performing loans and the loan-to-deposit ratio positively affect bank profit.  | [24] |
| 19 | Alam, M. A., & Shaikh, M. A. H. (2023).  | to measure the impact of some selected determinants on SMEs performance                                    | Primary data in 2021 were collected and sample size were 101. Only MS-Excel software were used.                              | Six independent determinants were: entrepreneurial competency, financial resources, modern technology, marketing capability, product quality, and investment capacity.           | There is a significant relationship between dependent variable and all the independent variables.  | [25] |
| 20 | Alam, M. A. et al., (2024)   | To measure the amount of SF and GF accounted as well as the performance of banks                           | Secondary Data from BB and MS-Excel software   | Six independent determinants were: ETP, biogas plants, solar home plants, HHK, green building, green   | 23 banks have reached the target of GF set by Bangladesh Bank, On the other hand, 15 banks reached their target of SF.   | [26] |

| SL | Author, Year, and Country                | Study Objectives  | Methods                  | Variables   | Findings  | Ref. |
|----|--|---|--------------------------|---|---|------|
| 21 | Sohel Rana, Md., & Hossain, S. Z. (2023) | in Bangladesh<br>To measure the Intellectual capital affinity and its impact on a/c and market performance. | Secondary data were used | energy<br>Value Added Intellectual Coefficient, ROA, ROE, Tobin's Q | IC and HC Efficiency showed a positive affinity and impact on firm performance. Structural Capital showed an insignificant relation on explained variables. | [27] |

Source: Prior literature and Desk studies, (2024)

### 3.1. Research Gap

After introducing GB guidelines in 2011 by Bangladesh Bank a lot of research work have been conducted throughout the year. Some research 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. Reference [28] made a comparison between Islamic banks and conventional banks regarding green banking performance. Reference [29] 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 for the period of (2014-2023). So, the present situation demands complete research to reflect a total scenario of the status of green financing and its impact on bank performance in Bangladesh.

### 3.2. 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 reference [30] 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.

### 3.3. Refinance Initiatives of Bangladesh Bank at the End of Q<sub>1</sub>, 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. The figure 2 showed 50 billion BDT is the highest allotment in green transformation fund and 1.25 billion BDT in Shariah based refinance scheme for green products.

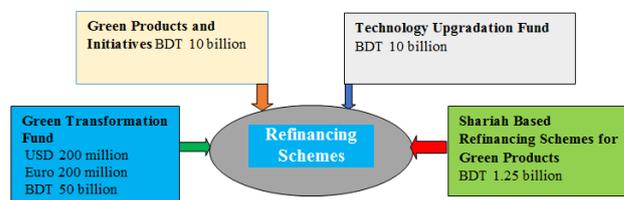


Figure 2. BB Refinancing Initiatives up to Q1, 2024. Source [31].

## 4. Results and Discussion

### 4.1. Category Wise Green Investment by Banks (2013-2023)

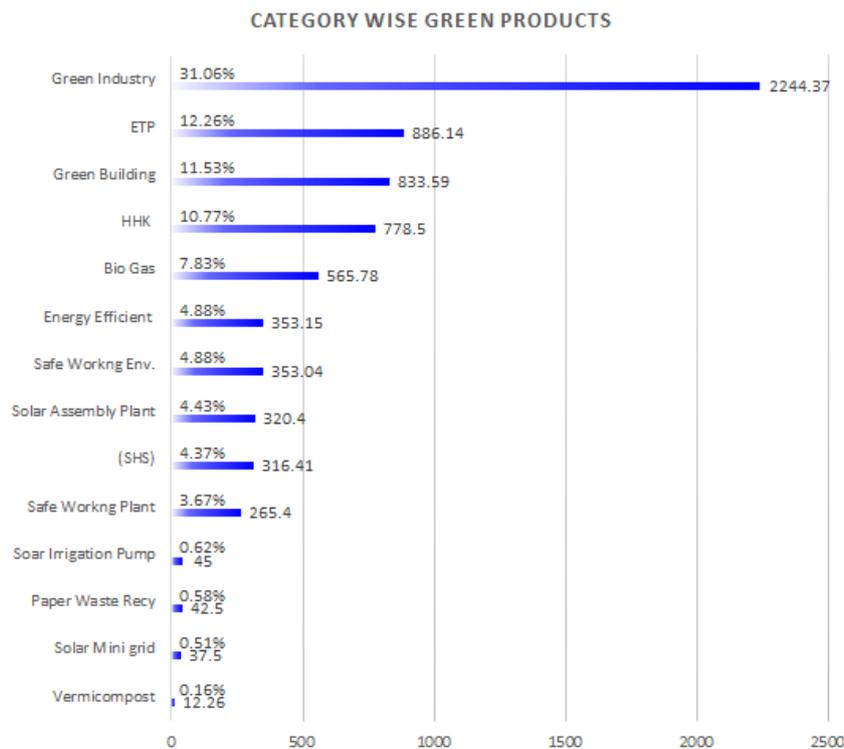


Figure 3. The Bangladesh bank Refinance Scheme for the Green Initiatives from 2013 to 2023. Source [31].

The Figure 3 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.

## 4.2. Bangladesh Bank Sustainable Finance at a Glance in 2023

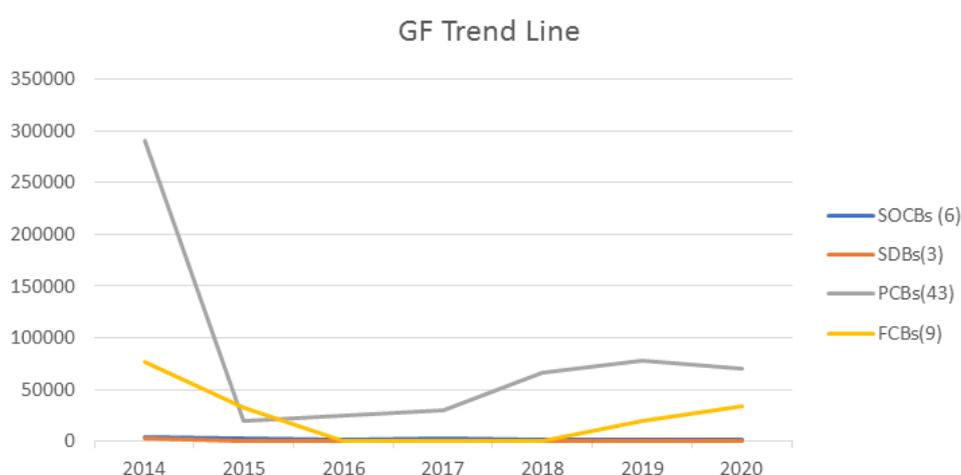
**Table 2.** Sustainable Finance (SF), Green Finance (GF), and Sustainable Linked Finance (SLF) (in million BDT).

| 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 2 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.

## 4.3. The Status of GF Trend Line (2014-2020)



**Figure 4.** GF trend line. Source [31]

Figure 4 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.

## 4.4. Overview of Sustainable Finance (SF) 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  $\geq$  20% of total loan disbursement.

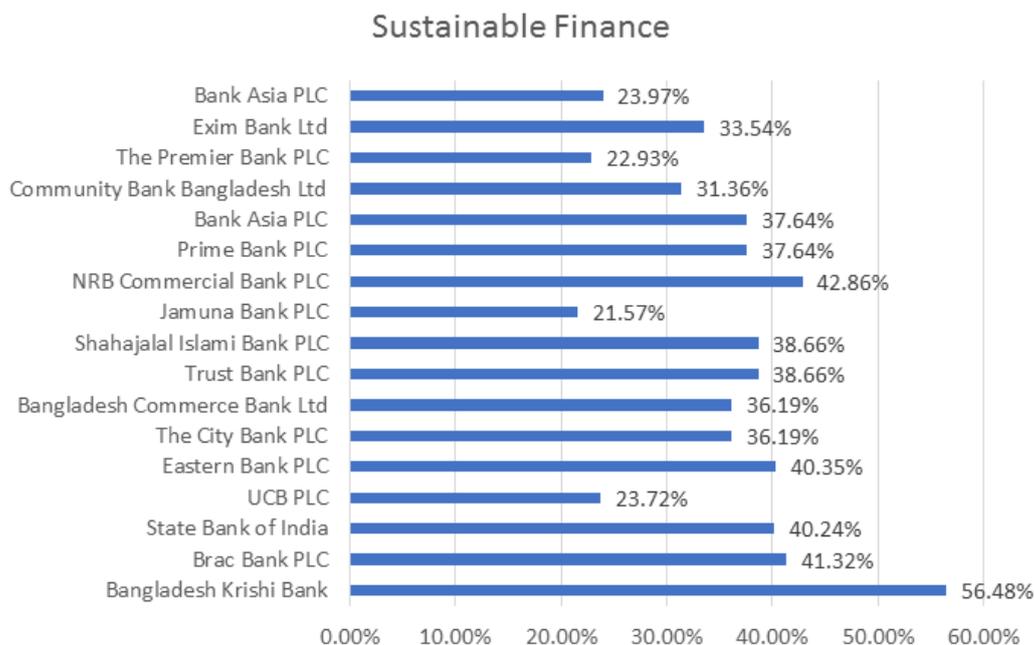


Figure 5. Sustainable Finance of Q4, 2023 of different commercial banks. Source [31].

Figure 5 shows that only 17 commercial banks fulfil the sustainable financing target SF  $\geq 20\%$  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%.

#### 4.5. Target Attainment of Green Finance



Figure 6. Green Finance of Q4, 2023 of different commercial banks. Source [31].

Figure 6 shows that only 22 commercial banks fulfil the GF  $\geq 5\%$  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%.

#### 4.6. Comparison Between GF and SF in 2023

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

| Banks        | GF 2023        |                |                |                | SF 2023        |                |                |                |
|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|              | Q <sub>1</sub> | Q <sub>2</sub> | Q <sub>3</sub> | Q <sub>4</sub> | Q <sub>1</sub> | Q <sub>2</sub> | Q <sub>3</sub> | Q <sub>4</sub> |
| 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%.

#### 4.7. Category Wise GF in 2023

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

| Green Finance   | 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 invested highest amount 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 respectively.

### 4.8. Green Finance Allotment in December Quarter, 2022



Figure 7. 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.

## 5. Bank-Wise Target Achieved in Bangladesh

### 5.1. Target Attainment by Commercial Banks

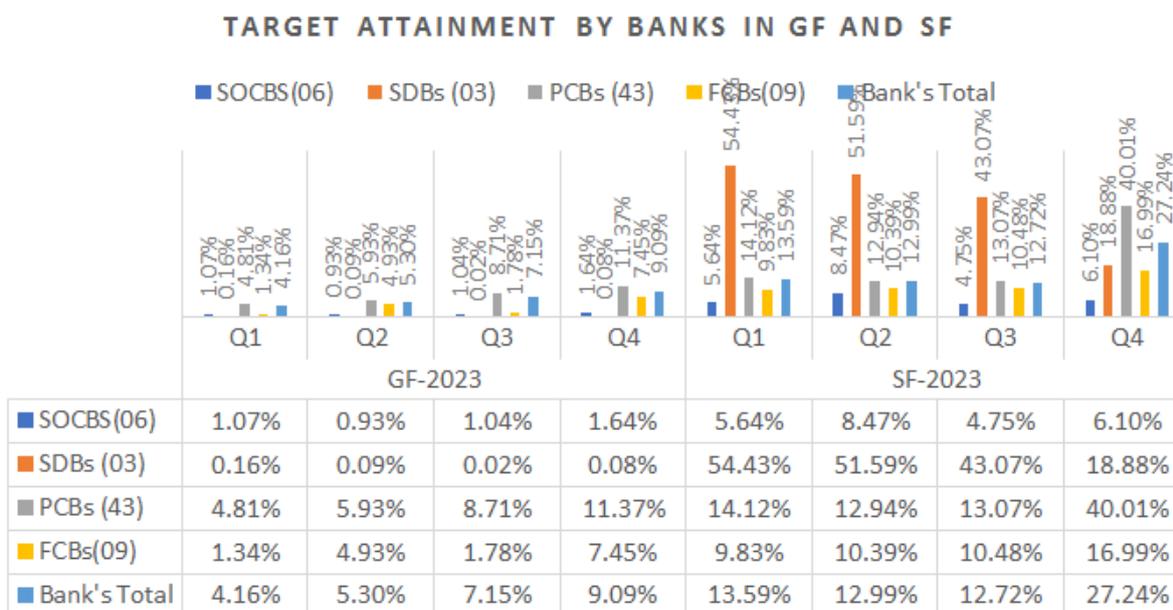


Figure 8. Target achieved by banks in GF and SF categorically in 2023. Source [31].

The Figure 8 indicates 61 banks’ exposure to green finance and sustainable finance in 2023 at a glance where PCBs GF is

11.37% and SF is 40.01% hold the highest position in Q<sub>4</sub>.

## 5.2. Sector-wise GF in Bangladesh

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

| Sub Category/Product Name                                  | Q <sub>1</sub> | Q <sub>2</sub> | Q <sub>3</sub> | Q <sub>4</sub> |
|--|----------------|----------------|----------------|----------------|
| 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 respectively.

## 5.3. 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.

## 5.4. Sustainability Ranking of Banks in Bangladesh

*Table 7. Sustainability Ranking of Banks-2022.*

| Banks                  | Non-Bank Financial Institutions |
|------------------------|---------------------------------|
| Brac Bank              | Agrani SME Financing Company    |
| Jamuna Bank            | Bangladesh Finance              |
| Prime Bank             | IDLC Finance                    |
| Shajalal Islami Bank   | Lanka Alliance Finance          |
| The City Bank          |                                 |
| Trust Bank             |                                 |
| United Commercial Bank |                                 |

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 shown in table 7. 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 enduring 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. <https://www.dhakatribune.com/273013>

## 5.5. In-House Year-wise GB Initiatives by Banks in Bangladesh

*Table 8. In-house green banking activities.*

| Activities                                    | Q4    |      | 2023 |      |              |
|---|-------|------|------|------|--------------|
|   | 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         |

| Activities                                      | Q4 2023 |        |           |        |              |
|---|---------|--------|-----------|--------|--------------|
|   | SOCBs   | SDBs   | PCBs      | FCBs   | Bank's total |
| 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 Q<sub>3</sub>, 2023 period on the topic is given below:

## 5.6. Training, Awareness, and Capacity Building Status of Banks

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 9 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.

## 6. Findings

a) Only 22 commercial banks fulfill the GF  $\geq 5\%$  of 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. 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  $\geq 20\%$  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, and it is a milestone to achieve SDGs set by the UN by 2030.

## 7. Conclusion

Bangladesh is a defenseless country regarding environmental transformation risk, so it should move onward by integrating green financing projects into conventional investment. A positive side is that BB is winning the leadership in initiating GF into the homegrown marketplace with a concrete dream of adopting GB in the monetary sectors. 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 not to invest in ecologically hostile projects, 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.

## Abbreviations

|       |                                 |
|-------|---------------------------------|
| BB    | Bangladesh Bank                 |
| GF    | Green Finance                   |
| SF    | Sustainable Finance             |
| FIs   | Financial Institutions          |
| UN    | United Nation                   |
| SOCBs | State Owned Commercial Banks    |
| PCBs  | Private Commercial Banks        |
| SDBs  | Specialized Banks               |
| FCBs  | Foreign Commercial Banks        |
| ROA   | Return on Assets                |
| ROE   | Return on Equity                |
| MV    | Market Value                    |
| CSR   | Corporate Social Responsibility |

## Author Contributions

Md. Ashraful Alam is the sole author of the manuscript. The author himself composed it, edit and approved the final manuscript.

## Funding

The work did not get any financial support from any internal or external organizations.

## Data Availability Statement

The secondary data that is collected from BB website can be found from author's e-mail on request.

## Conflicts of Interest

The author declares no conflicts of interest.

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## Biography



**Md. Ashraful Alam** earned his BBA and MBA degree from Islamic University, Kushtia, Bangladesh in 1998 and 1999 respectively. He then achieved Advanced MBA from Finance and Banking department in 2020. At last he completed his MPhil degree from the university of Rajshahi in 2024. He is currently working as an Associate Professor in Department of Management, Government College, Ministry of Education, Bangladesh. He has published more than 05 research papers as a first author in reputed international journals available online and another 02 manuscripts are under review. His main research work focuses on Green banking, Green financing, SME sectors, Job satisfaction etc. He has about 20 years of teaching experience and 10 years of research experience. He has been seeking prestigious PhD degree right now.

## Research Field

**Md. Ashraful Alam:** Green Banking, Green Financing, SMEs, Job Satisfaction etc.