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Innovative Policy Approach to Environmental Resource Management Through Green Banking Activities

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Abstract Green Banking (GB) plays a proactive role in welfare economy by taking environmental and ecological aspects into consideration as part of the quality of assets and rate of returns in the long term. Environmental investment is the core field of GB's accomplishments. Yet the GB authorities have been continually challenged, for several years, with a very important global issue: misuse of sensor networks through online banking. The study attempts to relook at the key banking network security tools that strengthen through authorized green investment for environmental management within and around the Lawachara National Park's survey and field experiment in Moulvibazar district of Bangladesh. The study found that amendments to GB related legislation peaked in Bangladesh between the years 2010 to 2020 but security remained low for internet banking services within the same period. The study showed the existing GB policy instrument is inadequate and sluggish for effective environmental investment; hence several GB performances are still jeopardized. The study also revealed 53% of the respondents stated network control unit was essential for green investment, online transaction, data protection and community environmental awareness. The findings pointed out that sensor networks affect customer, banking transaction, bank personnel, institution, national parks and its peripheral communities through misuse of unwanted radio frequencies from network towers and wireless servers. The processed radiation reflects off the stakeholders causing physical and psychological damage at a one to fourth ratio, and GB activities are often not satisfied. These results reflect the importance of protected sensor networks that the State Bank also provides. The findings indicated that the GB sectors are in risks from misuse of sensor networks due to lack of active sensor networks security systems. Scientific secured banking knowledge is essential in this sector effectively but such knowledge is poorly recognized. Thus, it is evident a dynamic and adaptable secured SN can be applied for technology-based GB relevant to policy integration, customer care and administration in order to foster sustainability of environmental investment which link to national policies and sustainable development goals 2030.

Keywords Environmental Resource, Green Banking, Awareness, Policy and Security

1. Introduction

Green Banking is a new idea in Banking sector to contribute environmental resource management. But these resources lose day by day due to misuse of wireless technology, obsolete policy, human interferences and climate crises (Miah et al., 2017, 2018, 2019, 2020, 2021, 2022). Banking sector is the backbone of any economic systems which ensure the development through the effective channelization of financial resources (Girish, 2015). This sector is commonly reflected as environmentally friendly and economically sustainably in terms of emissions, pollutions and degradation catastrophe. The present era of industrialization and globalization indicates a lot of comfort

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and luxurious life where lead to an alarming situation of huge environmental degradation integrated with all the concerned activities. Everyone exploits them but none can conserve profoundly due to lack of scientifically effective policies and instruments in Banking Sectors. There are some major challenges regarding to Green Banking Policy and Technology, such as to access environmental information without Government support, difficulty launching voluntary emission-reduction projects, stopping lending to traditional high pollution and high emission sectors, for example tannery or textile sector immediately and lack of evidence for the business case (IFC, 2012) which impact on national environmental problems. Internal environmental impact of the banking sector such as use of natural resources like energy, paper and water are relatively low and clean. Environmental impact of Banks is not tangibly related to their banking operations but with the customer's activities. So, environmental impact of banks' peripheral activities is huge though difficult to estimate. Additionally, environmental management in the banking business is like risk management. This augments the enterprise value and lower loss ratio as a higher quality loan portfolio result in higher incomes. For this purpose, inspiring environmentally responsible investments and prudent lending should be one of the responsibilities of the banking sector. As far, some industries which have previously become green and which are making serious attempts for growing green, should be bestowed priority to lending by the banks. According to this method of finance can be called as "Green Banking", an attempt by the banks to make the industries grow green and in the process of restoring the natural environment. The idea of Green Banking is mutually beneficial to the Banks, industries and the environmental economy. It is not only facilitated to ensure the greening of the industries but it will also improve the asset quality of the Banks in future (NPA, 2015). Internationally, there is a growing concern about the role of banking and institutional investors for environmentally responsible and socially suitable investment projects (Earth Summit, 1992). But there is no proper framework in Bangladesh to enhance Green Banking to foster the linkage between economic development and environmental sustainability. Green banking is functioning like a normal bank, which considers all the social and environmental/ecological factors with an aim to protect the environment and conserve natural resources (Thombre, 2011). Lack of reliable information and sound assessments can cause undesirable consequences for the understanding of Green Banking, thus the need to update rules and regulations and for the development of indicators and indices which permit changes and trends to be observed and transformed over time. For these reasons, this study attempts to develop a framework related to the Green Banking (GB) with alternative policies and update applications of technologies for sustainable environmental conservation indicating the adjacent areas of Lawachara National Park in Moulvibazar district of Bangladesh.

1.1. General Context

"Green" in green banking principally indicates banks" environmental accountability and environmental performances in business operation (Bai, 2011). It means eco-friendly or environment-friendly banking to stop environmental degradation to make this planet more habitable (Azam, 2012). An orthodox Bank becomes a Green Bank by directing its core operations toward the betterment of environment to perform the Green Banking Activities from the existing State and Nations for getting environmentally benefits (Lalon, 2015). A green bank is also called ethical bank, environmentally responsible bank, socially responsible bank, or a sustainable bank, and is expected to consider all the social and environmental issues (Habib, 2010; Goyal and Joshi, 2011). The concept of 'Green Banking' originates in modern banking approaches. The concept has actually been derived from ethical banking which seeks to mitigate the hazards of climate change due to global warming. Climate change has direct impact on biodiversity, agriculture, forestry, water resources and human health. Due to unusual weather pattern, rising greenhouse gas, declining air quality etc. society demands that businesses also take responsibility of safeguarding the planet. Green finance as a part of green banking can make great contribution to the transition to resource-efficient and low-carbon industries i.e., green industry and green economy in general (Naim, 2015). Green Banking refers to the initiatives taken by the Banks to encourage environment-friendly investment. Green Banking is a simple phenomenon but its magnitude is significantly global wide covering social, economic, environmental and technological aspects. Green banking is a kind of banking conducted in selected area and technique that helps in reduction of internal carbon footprint and external carbon emissions (Bahl, 2012). It is a device that considers social and ecological dynamics to protect environment and conserve natural resources not only national but also regional and global perspectives. The persons who are involved in Green Banking activities, they think protecting environment and conserving power and energy in order to ensure a safer world for the present and upcoming generations. They also think that the green banking is their special agenda to take care of environment of the earth particularly afforestation and reforestation campaign programs. Human beings live in the society to work for the harmony for building congenial social environment. Corporate Social Responsibility (CSR) activities are concerned about development and prosperity of the society. Green Banking confirms the human-beings in the society both in mentally and physically to work sustainably which can mitigate credit risk, legal risk and reputation risk.

1.2. Green Banking Policy Adoption and Perspectives

Green Banking Policy is a formal and structured manner in line with global norms so as to protect environmental

degradation and ensure sustainable Banking practices. With a view to developing Green Banking practices in the country, an indicative Green Banking Policy and Strategy framework has been developed for the Scheduled Banks which is covered through time frame work segregating into following 3 phases (BB, 2011; Lalon, 2015). There are several characteristics of Green Banking Activities to implementing by Scheduled Banks from 2011 to 2013 and continue which is shown in the Figure 1.

1.3. Environmental Degradation and Green Banking

The world is concerned and worried about environmental degradation including climate change, global warming, environmental pollution, deforestation, loss of biodiversity, land conversion, man-made fire and human interferences. The rapid changes in climate have direct impacts on biodiversity, agriculture, forestation, protected areas, land, water, air, human health and so on which are shown in the Figure 2 with DPSIR Framework including Drivers, Pressures, State and its Impact on the environment (Braat, et al., 2008). Urgent effective steps are needed to save the planet against climate change issues.

Bangladesh is the most climate change vulnerable country. Climate change has compelled us to think about protection of environment and conservation of energy. We, human-beings, also think about renewable energy for our existence particularly environmental economics. Banks hold a unique and vital position in the arena of environmental economy. Bankers can contribute much to develop the national and global economic systems for performing good reputation. Green Banking system is a tool to acquire this reputation for reduction of environmental degradation including energy consciousness, green credit cards, online and paper-less banking and so on which are shown in the Figure 3.

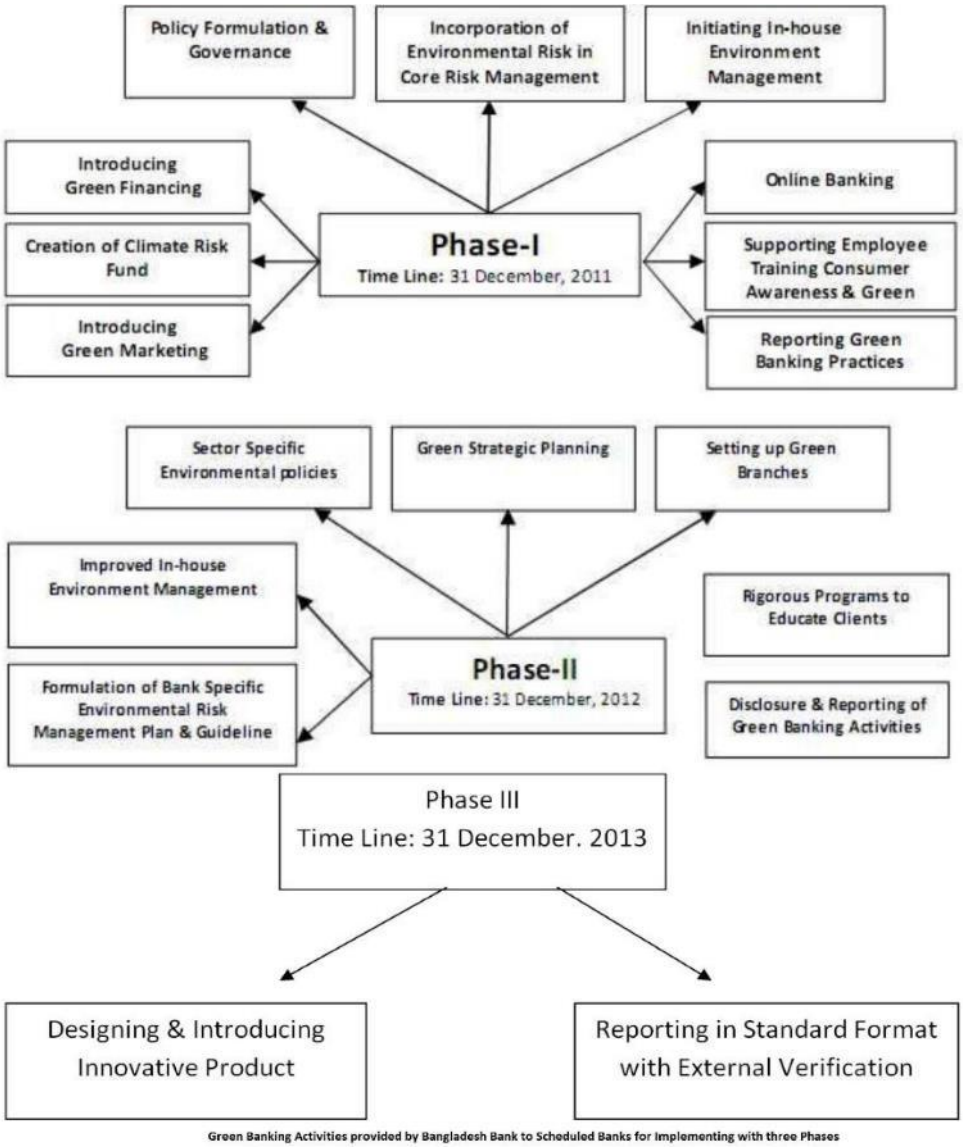

Figure 1. Showing different phases of implementing Green Banking Activities provided by Bangladesh Bank to Scheduled Banks for implementing three phases (BB, 2011; Lalon, 2015)

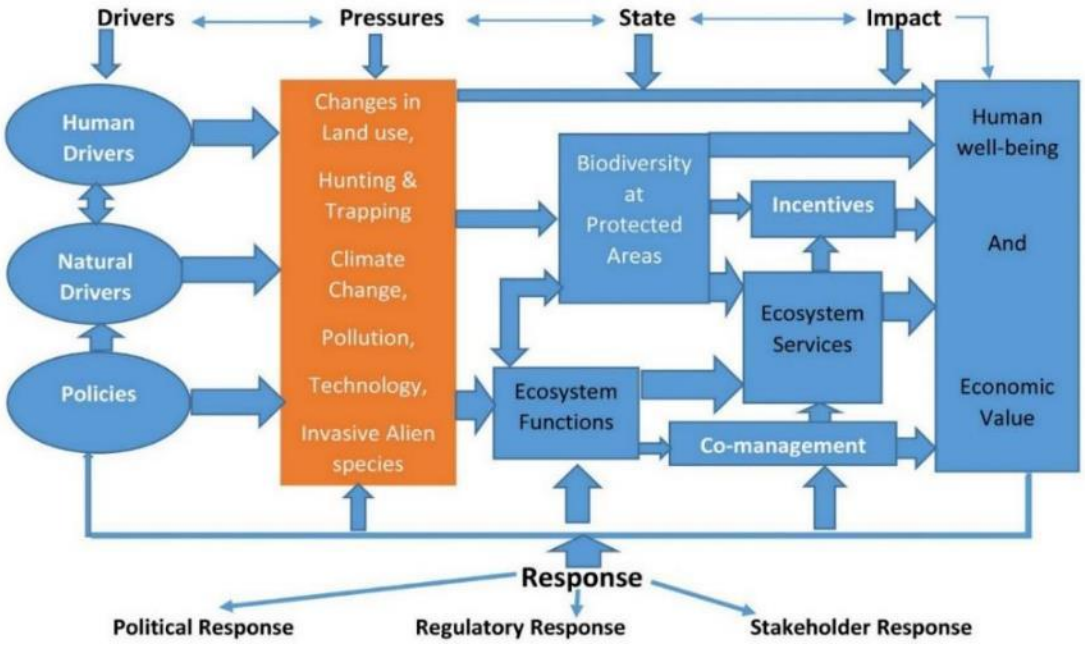

Figure 2. DPSIR framework shown the Drivers, Pressure, State, Impact and Response to the environmental degradation with relevant parameters particularly environmental policy

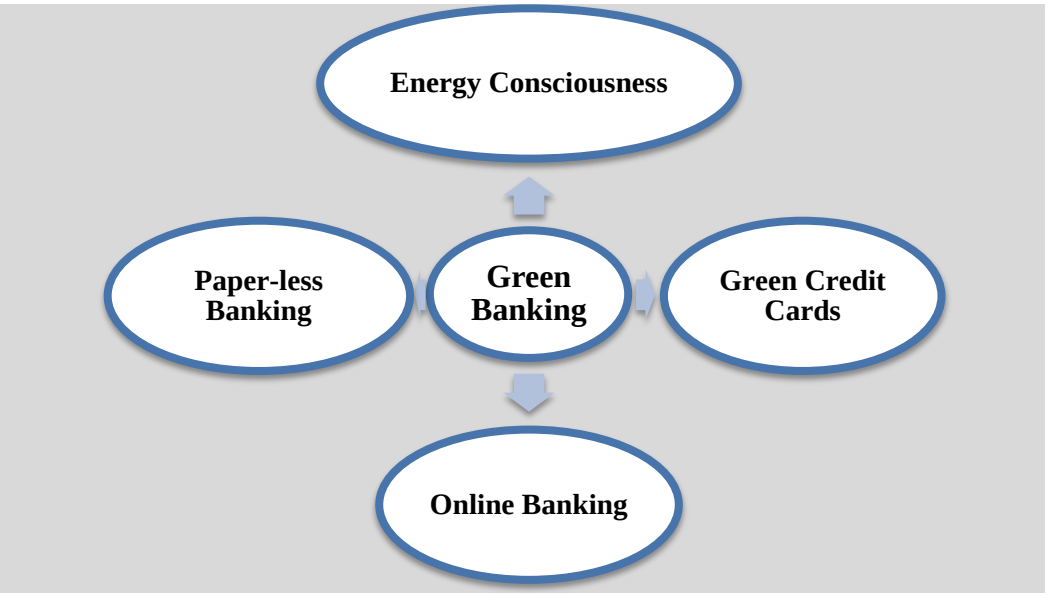

Figure 3. Showing Green Banking Systems including Green Credit Cards, online and paperless Banking and energy consciousness

2. Materials and Methods

2.1. Data Collection

The survey on Green Banking systems was undertaken by Rupali Bank Limited, Moulvibazar district, Bangladesh regarding the existing policy reviews. Primary and secondary data collection was done from different Government Officials, Bank Managers, stakeholders, Customers, Clients, Technologists, Environmentalists, Researchers, policy-makers, investors, co-management team leader and NGO Officers at four villages (Lawachera Punji, Magurchera Punji, Duluchera, Langurpur) adjacent of the Lawachara National Park in Moulvibazar, Bangladesh. Data collection methods employed collected both secondary and primary including observations, semi-structured interviews, and questionnaires. Furthermore, key informants from the relevant Bank such as administrative, analyst, professionals, environmental lawyers and local customers were interviewed on the existing phenomena. The Secondary data were collected from journals, books, Bangladesh Bureau of Statistics (BBS), existing Bangladesh Bank Green Banking policies, Government institutions, Ministry of Environment and Forests, and Ministry of Commerce, Training Centre, Universities, International / National-NGOs, Stakeholders and relevant other sources.

Table 1. Status of Respondents in the studied area

Name of village	Existing Households (NSP, 2006)	Total Existing Member	Number of Respondents	Respondent's rate (%)
Lawachara Punji	23	116	29	25%
Magurchera Punji	41	165	48	29%
Dolubari	84	255	46	18%
Langurpur	92	278	83	30%
Total	240	814	206	25.5%
Other Respondents		247	87	35.22%
Grant Total		1061	293	30.36%

2.2. Data Handling and Analysis

Data obtained from the field were analyzed using standard data analysis software. In this study, deductive strategies were used to present the results through the combined interpretations made with the Supervisor and Investigator after collecting the data, organizing and classifying them in order to figure out the relationships that existed, using the relevant software, such as MS Excel, SPSS, Operating System and updated software on green Banking systems.

2.3. Data Compilation

After the data had been collected, they were checked properly for accuracy, by using the crosschecking method, i.e. checking the same information from different sources and verifying the sources of information. Information regarding the initiatives of the authority towards the Green Banking policy and technology was also collected through different relevant secondary sources. The compilation also included preparation of data master sheet and data manipulation into convenient forms used in the result and discussion section subsequently. The primary and secondary data were compiled with the MS Excel and relevant software. This method supports sustainable environmental conservation in relation to green banking data integration, data compilation, analysis and development of models related to biodiversity conservation, low-carbon investment instruments and decision-making processes. This research approach was connected with the whole research procedure including primary and secondary data collection on the priority of qualitative and quantitative data (Kothari, 2004). The research method uses raw and original data collection related to customers' involvement towards green banking accomplishments. This research integrated its philosophy, approach, strategy, and time horizon with collected data sample size. The average sample size is 30.36% with respondents' rate which as shown in Table 1.

The rest of respondents add up to 87 including Bankers, visitors, biodiversity specialist, forest officer, biologist, agriculturalist, ecologist, conservationist, environmentalist, policy-maker, botanist, zoologist, wildlife manager, co-management team leader, judges, environmental lawyer, indigenous community leader, academicians and NGO officers. All collected data have been compiled with statistical software for analysis, interpretation and psychological exploration.

2.4. Data Analysis and Interpretation

The research method was associated with different parameters to enhance data collection, compilation, analysis and interpretation. Quantitative and qualitative data related to green banking were obtained through field observation, interviews, field surveys, focus group discussions, and informal discussion while secondary data were obtained from diverse sources with environmental investment assessment method. The data were compiled and analyzed for presentation and interpretation using standard data analysis software such as MS Office Suite 2021.

3. Results

3.1. Environmental Resource Instruments

From the field observation, environmental instruments enable to promote the environmental conservation among diverse stakeholders surrounding the Lawachara National Park in Moulvibazar district. These include:

(i) conservation resource awareness, (ii) attitudes, (iii) collaboration, (iv) environmental education, (v) visitor's satisfaction, (vi) local settlement, (vii) low carbon investment, (viii) indigenous people involvement, (ix) gender participation, (x) integration of stakeholder, (xi) Green Investment, (xiii) community association, (xiv) Tourism Activities and Tourist Guiding, and (xv) media exposure. The findings of some of the Green Banking instruments are illustrated below successively.

3.2. Enhancement on National legislation

National rules and regulations lead to amend for enhancement of green banking activities for sustainable environmental conservation adjacent the National Parks in Bangladesh. Environmental conservation related national legislation produced maximum within the period of 2010-2020, as shown in Figure 4. The study found that most of legislations related to environmental management stated on Sustainable Development Goals 2030, meanwhile Convention on Biological Diversity (CBD) provided

circulations to the state parties for update the national legislation in connection with Aichi Biodiversity Targets 2020. The Government of Bangladesh produced the rules and regulations except dynamic digital security within the stipulated period. The study suggested that the government takes initiatives policy integration for green banking services using secure wireless sensor networks among different banks operating surrounding the national parks in Bangladesh.

3.3. Green Banking Activities

The study showed the different accomplishments of Green Banking to contribute for environmental resource management, which as shown in Table 2.

3.4. Green Banking Status

In Bangladesh, there are four types of Green Banking services, which are State Green Banking Services, Specialized Green Banking Services, Private Green Banking Services and Foreign Green Banking Services. From figure 5, the graph showed that the rate of online services of State Bank is 5.08%, where Private and Foreign Banks are above 90% online services. The study also compares with Specialized Bank and State Bank for Online Banking Services.

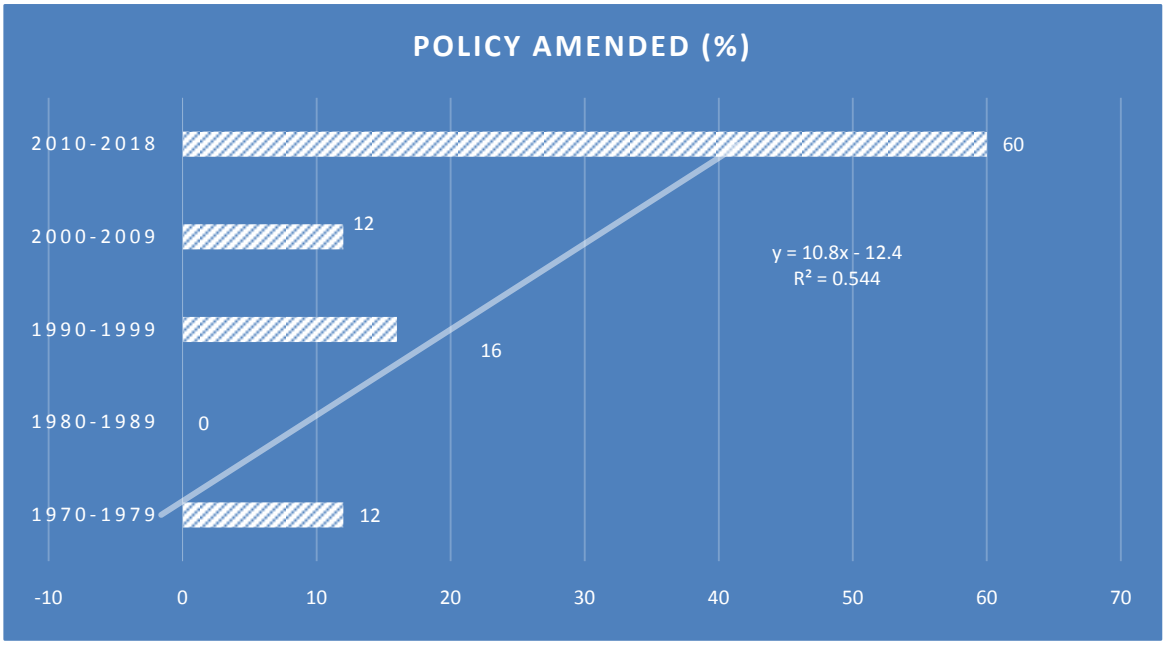

Figure 4. Produced Number of Legislation in connection with green banking activities in Bangladesh

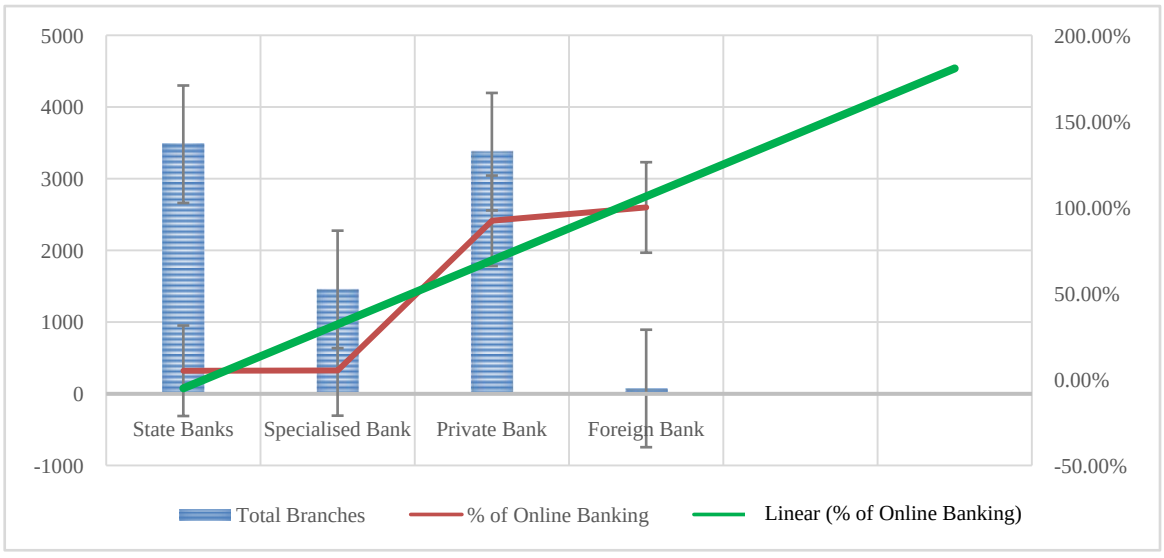

Figure 5. Green Banking Status Services among State Bank, Specialized Bank, Private Bank and Foreign Bank

Table 2. Green Banking Activities implemented with different parameters and outputs from Rupali Bank Limited (RBL)

Implemented Parameters of Green Banking	Accomplishments	Approved body
As per BRPD Circular 02/2011, Green banking unit, under Industrial Credit division of RBL has formulated a Green Banking policy.	Policy Formulation & Governance	The Board of Directors of RBL.
Green banking activities review and supervise regularly.	Audit, review and supervising	A high powered committee comprising of directors
A general circular has been issued for efficient use of electricity, water, paper, Eco-font ink, stationery, gas, fuel etc.	In-house Environment Management	A high powered committee comprising of directors
Using energy efficient bulbs, duplex printers, pen drives, E-mail, E-statement, automated power switching, energy efficient cars etc.	Regulations have been enforced to ensure cleanliness in Bank premises.	A high powered committee comprising of directors
Bank has taken steps to assess the environmental aspects along with existing credit risk in its credit allocation.	Incorporation of Environmental Risk Management	General and Sector specific environmental due-diligence Checklist specialists.
Covering poultry, Dairy, cement, chemicals, pesticides, pharmaceuticals, engineering, housing, pulp & paper, sugar & distilleries, tannery, textile & apparels, ship-breaking etc.	Environmental due-diligence to get an environmental risk rating	General and Sector specific environmental due-diligence Checklist specialists.
RBL has become involved CSR activities, covering environmental, social, health, educational and cultural advancement	Climate risk fund/CSR Activities	General and Sector specific environmental due-diligence Checklist specialists.
ETP, Bio-gas plant, solar panel/renewable energy plant, bio-fertilizer plant, Brick field having Hybrid Hoffman Kiln, Zigzag kiln, VSB kiln, Bulls trench kiln, Fixed kiln, Auto brick field, Waste management plant, Mushroom project, Horticulture, forestation etc. is now given priority.	Green Financing	General and Sector specific environmental due-diligence Checklist specialists.
The Bank is sensible to the persisting environmental laws in Bangladesh. In the case of financing, projects which do not conform to these laws are not acceptable.	Environmental laws in Bangladesh	General and Sector specific environmental due-diligence Checklist specialists and collaboration with Department of Environment.
RBL has allocated budgets for green finance of BDT400.00 & 422.00 crores in 2012 and 2013 respectively in its annual budget.	Budget Allocation for green finance	General and Sector specific environmental due-diligence Checklist specialists.
Bank has given priority to financing environment friendly jute bag manufacturing industries.	Environment friendly Banking Services	General and Sector specific environmental due-diligence Checklist specialists.
(i) Plant tree, Save the environment; (ii) Bankers cannot avoid social, environmental and economic responsibilities, (iii) We think about sustainable development without harming environment and profit is our logical sequences, (iv) Pay your bill online, f) Reduce, reuse and recycle, g) Be paperless, (v) Digitize yourself, (vi) Unplug electronic device while not in use.	Awareness slogans for Green Marketing	General and Sector specific environmental due-diligence Checklist specialists.
Arranging seminar, workshop etc. to raise awareness regarding green banking activities.	Research Green Banking Activities	General and Sector specific environmental due-diligence Checklist specialists.
To be built the mind set-up of Green Bankers, reduce the declining energy and resources.	Optimum utilization of resources	General and Sector specific environmental due-diligence Checklist specialists.
RBL is keen to emphasize on the easiest way to save environment by lessening paper waste, saving gas and fuel, reducing carbon emission, reducing printing costs and postal expenses.	Online Banking Activities	General and Sector specific environmental due-diligence Checklist specialists.
RBL has trained its Executives / officers on green banking through 3 training programmes held in BIBM in 2011. A mandatory session kept in every foundation course/ training on GB	Employee Trained-up on Green Banking Activities.	General and Sector specific environmental due-diligence Checklist specialists.
Bank's green banking activities has been disclosing in Annual Report, Bank’s website and RBL bulletin.	Disclosure of Green Banking Activities	General and Sector specific environmental due-diligence Checklist specialists.
RBL has posted a full timed and dedicated officer who co-ordinates over all green banking activities and take proper step for refinance from Bangladesh bank.	Other activities of Green Banking	General and Sector specific environmental due-diligence Checklist specialists.

3.5. Status of Climate Risk Fund

Climate Risk fund indicates on the fund for allocation and utilization of various banking services, such as: State Owned Commercial Banks, Specialized Commercial Banks, Private Commercial Banks and Foreign Commercial Bank. The grand total climate risk fund is 2145.35 BDT (in million) for allocation and used 157.65 BDT (in million) for utilization, which as shown in Figure 6. The study also compares with different commercial bank in connection with green banking activities in Bangladesh.

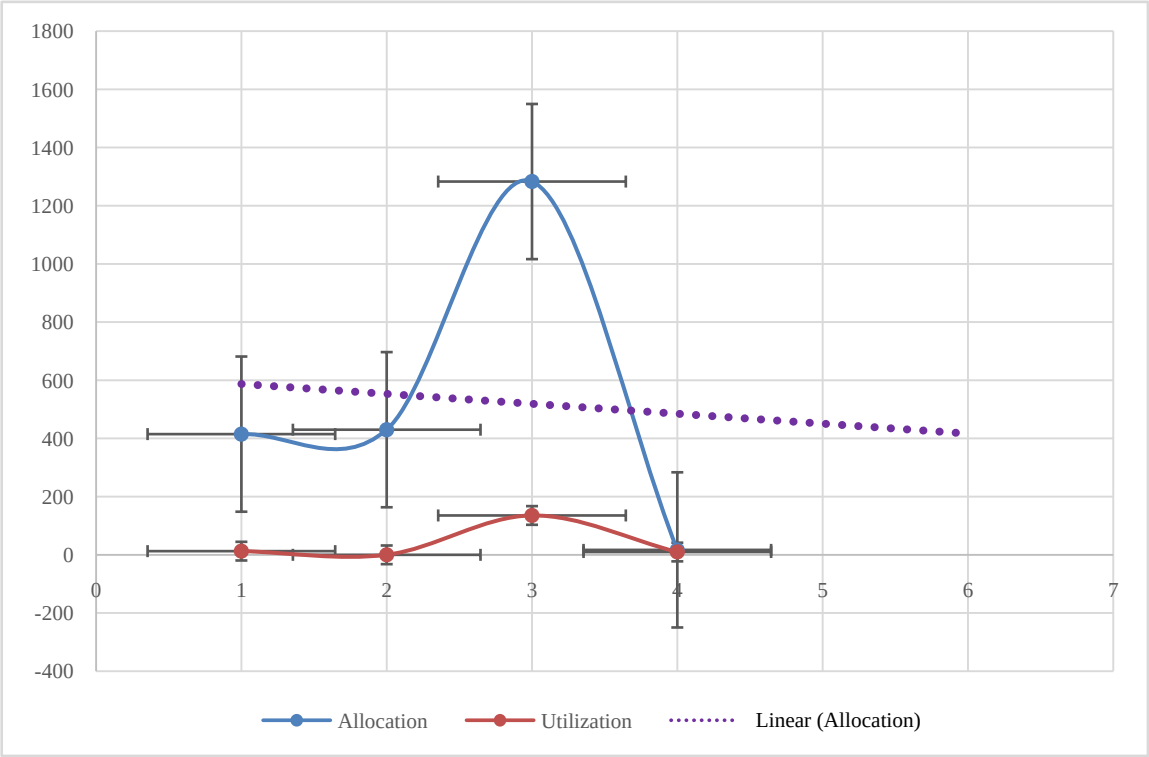

Figure 6. Climate Risk Fund for allocation and utilization (in million BDT)

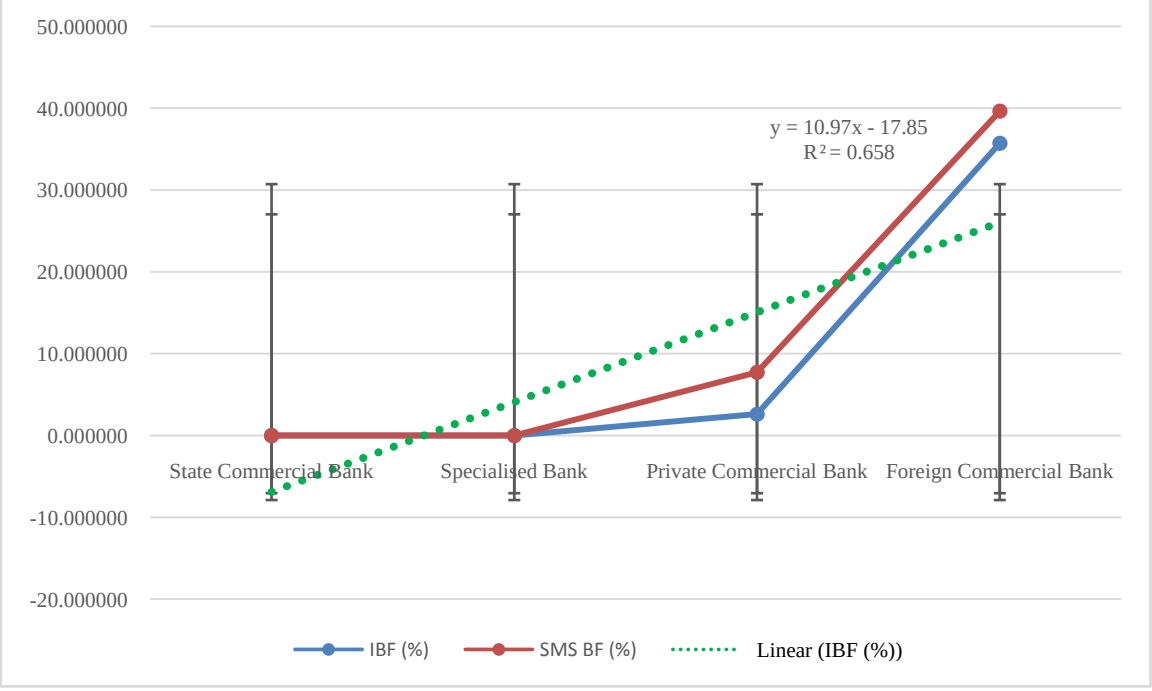

Figure 7. Scenarios of Internet and SMS Banking Facility in Bangladesh

3.6. Scenarios of Internet and SMS Banking

The study showed the scenarios of internet Banking and SMS Banking activities to lead the environmental resource management, which as shown in Figure 7.

Figure 7 showed that the Scenarios of Green Banking Facilities have started to focus on Internet Banking, Mobile Banking and SMS Banking in Bangladesh. The study shows from the returns that 2.62% and 7.73% of the total number of accounts have been facilitated at private commercial banks with internet banking and SMS banking facility respectively. The State-owned commercial Banks and Specialized Development Banks need to go a long way in online, internet and SMS Banking Facility in connection with accomplishments of Green Banking Services.

3.7. Community Environmental Awareness

Knowledge of Respondents on Green Banking System (GBS) is imperative, since, along with the knowledge on GBS, they need to know the worth of relevant policies and technology that deals with the input, processing and output of the green banking systems. Environmental Protection is important in daily life. The respondents cannot perform a single task without its information. There are 100 respondents who are involved with Green Banking Activities either directly or indirectly in the community as well as adjacent villages who responded on environmental awareness in study areas which are shown in the Figure 8. About the 53% of the respondents opined the awareness as "very essential", 44% as "essential", 2% as "Approximately" and only 1% "No Comment". These respondents were of different categories, such as Government Officials, Bank Managers, Clients, Customers, Environmentalists, Policy-makers, Environmental Lawyers, Co-management Team Leaders, Local people, NGOs Officers, Forest Officers and network specialists. Nowadays, an increasing number of customers of many conventional banks request for green financial products and investment opportunities (Arnsperger, 2012).

Table 3. The applications of Green Banking Technology to the Scheduled Banks

Parameters	Characteristics	Remarks
Green Banking Data Collection	Most scheduled Banks have not built the necessary database of the companies' environmental and social records, thus the current information is too limited for Banks to analyze the borrower's E&S risks or regulation violations	Enhanced green banking technology.
Measuring Green Banking Impacts on Environment	Regulators should assess the influence and range of the policy, the experience learned during the implementation, and ways to improve and adopt the green credit policy. Regulators should also measure the extent, capability and outcome of implementation, and analyze good practices as well as problems exposed during the process.	Reciprocal relationship on policy-technology
Providing Green Market Incentives towards Environmental Protection	Some commercial banks pointed out that if they reject different polluting companies; they may lose certain "premium" customers in the short term and so see reduced revenue. Moreover, most companies in the environmental-protection industries are small and medium enterprises and start-ups with fewer assets to use as leverage. Banks usually do not grant loans to these businesses due to the high risk and low return on investment.	Connected with customer relationship management systems.

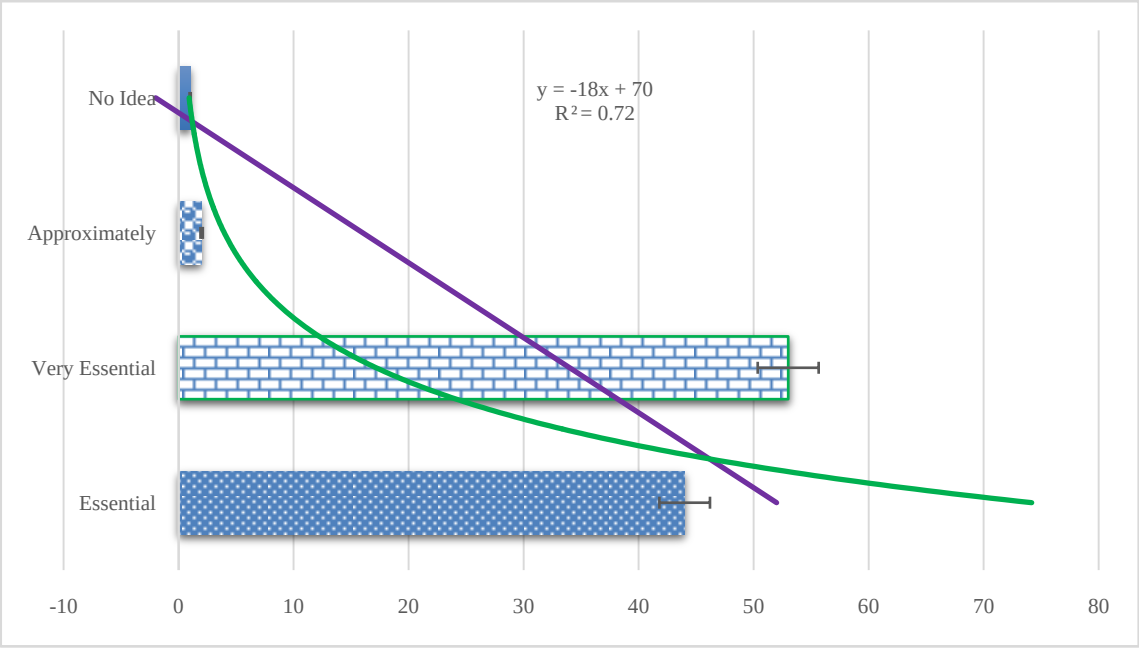

Figure 8. Perception on Green Banking Activities with Environmental Awareness among the community respondents' adjacent villages of Lawachara National Park in Moulvibazar district of Bangladesh

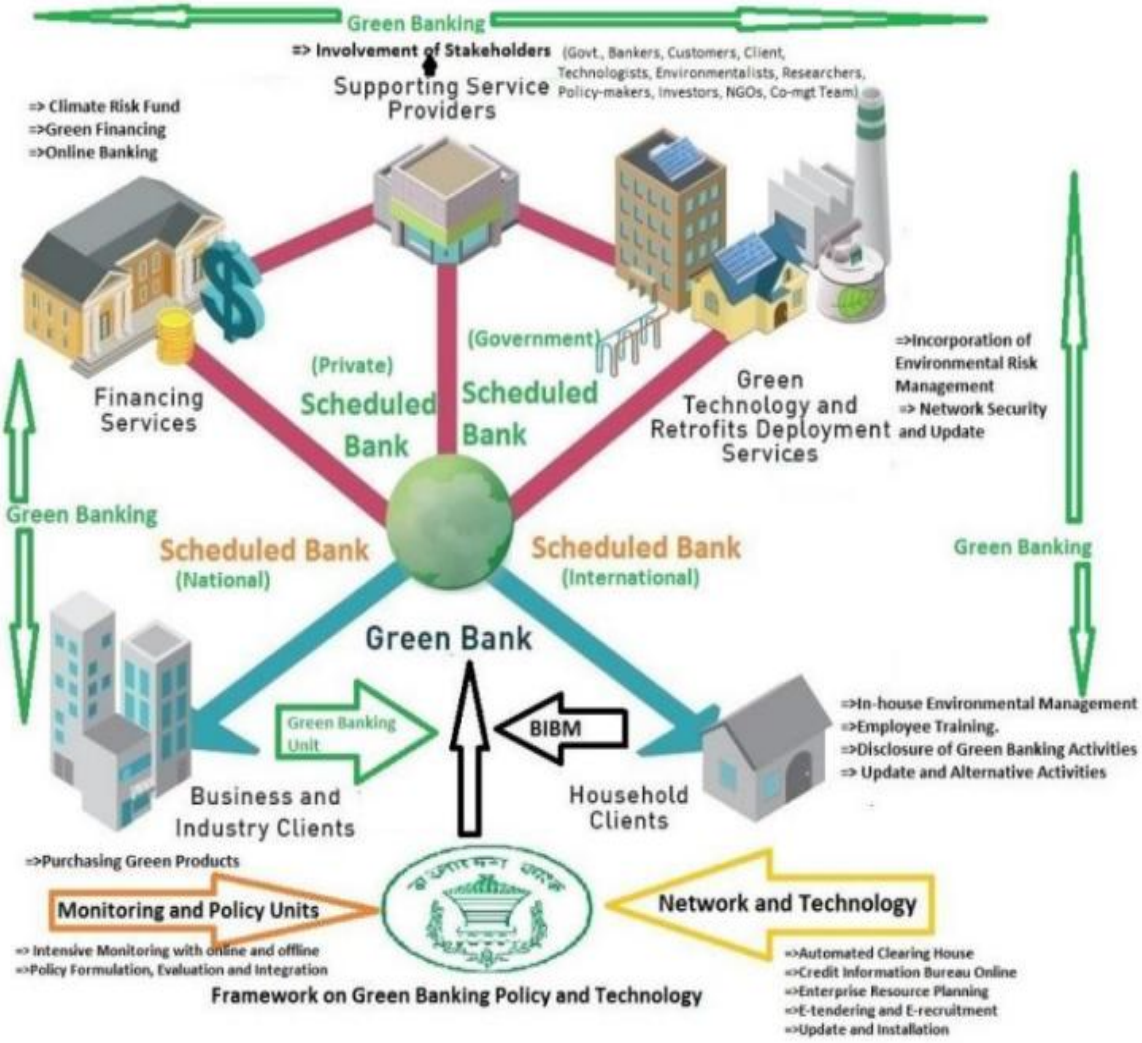

Figure 9. Framework on Green Banking Policy and Technology Adoption

3.8. Green Banking Innovative Technology

Green Banking Technology (GBT) is a new technology to work on banking activities including green finance, green economy, green card and so on. The GBT mainly uses data collection, data processing, measuring impact, providing green market incentives, Customer Relationship Management Systems (CMRS), Enterprise Resource Planning (ERP), Annual and Other Reports Preparing and Feedback Sharing, Automated Clearing House (ACH), Credit Information Bureau Online (CIBO), Enterprise Data ware House (EDH), and E-servicing (e-tendering and e-recruitment. These applications of GBT are identified as common standards themes in policy development and implementation and of them, three themes were explored in greater depth (Singh and Singh, 2012, pp.41–45) in the scheduled Banks which is showed in the Table 3.

Therefore, the Authority of Bangladesh Bank should continue to discuss how to encourage commercial banks to implement sustainable finance practices using up to date technology through market incentives and mechanisms of Green Banking Activities. And for these purposes, all Scheduled Banks can follow the instructions from the central Bank for Green investment and other Green Banking activities within technological arena which is shown in the Figure 9. Green Banking is a new and growing tool to conserve biodiversity and its habitat to deal with the distributive effects of conservation in an integrated innovative way (Bagnoli *et al*., 2008). Money is channeled from Bankers /Financial Institutions Owners, who would like to use national park's biodiversity rich areas, to those who protect and manage national park on their properties in connection with Government's Green Banking Policy requirements. This way, distributive issues are solved through market-based mechanisms on the required targets of afforestation and reforestation programmes. Green Banking is one of the Banking activities that concentrates on socio-economic and environmental (ecological) factors with an aim to protect the environment and conserve natural resources (Rengasamy, 2014).

Environmental policy instrument is connected to socio-economic factors with environmental considerations at the heart of decision-making on environmental issues, among others, including biodiversity, climate change and ecosystem decline. Biodiversity is the core arena of these environmental issues. Bangladesh is one of the most vulnerable countries facing the impacts of environmental degradation (Orts, 1995). The countrymen recognize the fact that the contribution of banking sectors along with digital technologies are very crucial in growth and development activities (Figure 8), which can play more effective role in mitigating the environmental degradation (Rahman and Barua, 2016). The current time of technological development indicates huge relaxation and luxurious lifespan which tend to lead to an upsetting condition of massive ecological dilapidation brought about by these alarming actions. Authorities of Lawachara National Park can participate in this green banking program. The study investigates the Green Framework and Computing Applications through green investments and community environmental awareness (Sharpe, 1982) in the surrounding areas of Lawachara National Park (LNP) in Moulvibazar district. The study showed that 44% and 53% of the respondents respectively stated that it is essential and very essential for the authority to undertake the necessary actions to fulfill the policies provided by Bangladesh Bank to Scheduled Banks within the existing areas of investment for sustainable conservation efforts.

4. Discussion

4.1. Environmental Risks for Banks

Environmental performance is highly correlated to financial performance and banks suffer from financial risk due to lack of environmental considerations in business practices (Hamilton, 1995, pp. 98–113); (Blacconiere and Pattern, 1994, pp. 357–377). Bangladesh is a signatory member of CBD (Convention on Biological Diversity). According to Aichi Policy Target 4 " By 2020, at the latest, Governments, businesses and stakeholders at all levels should have taken steps to achieve, or have implemented plans for, sustainable production and consumption, and have kept the impacts of use of natural resources well within safe ecological limits" (CBD, 2010, pp. 8–9). For this purpose, Bangladesh Bank can take initiatives to update sustainable Banking policy and technological framework in order to articulate strategic commitments to sustainable development and approaches to risk management, particularly the Policy on Environmental and Social Sustainability, the Performance Standards with clients, responsibilities for managing their environmental and social risks and the Access-to-Information Policy with commitment to transparency. Banks with higher rating and total assets were also better accountable socially and environmentally (Cosmin *et al*., 2008, pp. 620–625). European Banks seem to be leaders in the international green market compared to other continents as a whole and have developed a unique environmental philosophy (Papastergiou and Blanas, 2011). Banks are exposed to many risks that may lead the Banks to face loss in terms of reputation and profit. Banks may not get the money used to finance their clients back and, can face credit risk and reputation risks. Green Banking integrates with people, planet and profit to save the environment, which as shown in Figure 10.

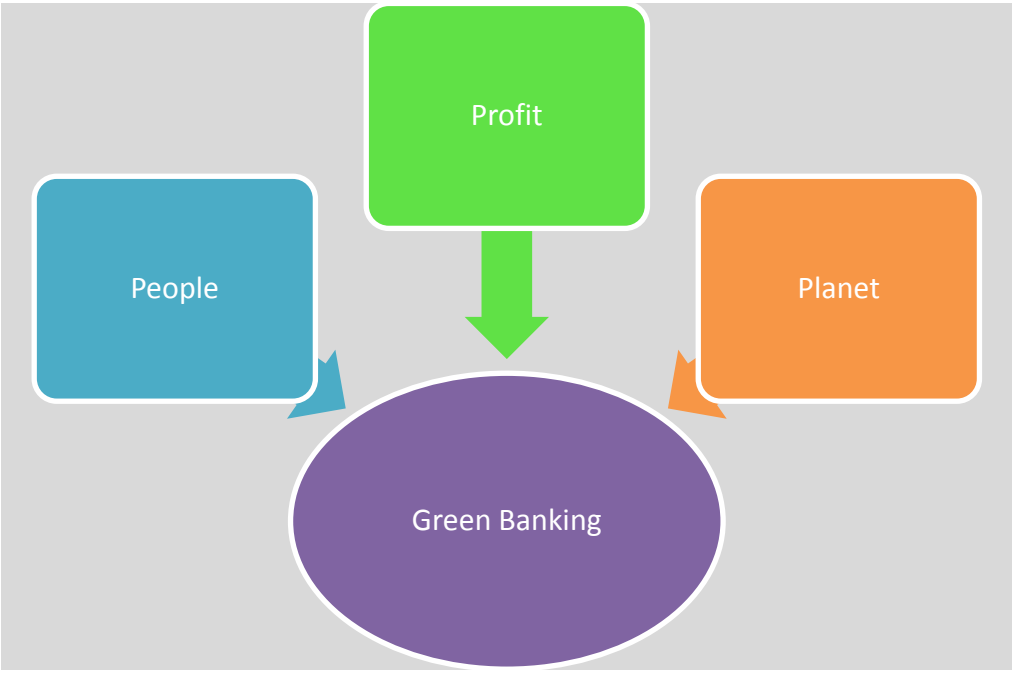

Figure 10. The Triple Bottom Line Approach for Green Banking

So, the risk to the Banks from the Banks' commercial lending activity is high. Besides, the liability from the Banks' own operations, greater risks are from Banks; commercial lending and can be categorized (Weber *et al*., 2005); (Weiler *et al*., 1997) into following types, such as—(i) People, (ii) Profit, and (iii) Planet. There is a reciprocal relationship among each other. This is called Triple Bottom Line Approach which is shown in the Figure 10. Verma (2012, pp. 110–114) stated that Banks are gradually coming to realize that there is need for a shift from the "profit, profit and profit" motive to "planet, people and profit" which in fact establishes the rationale for green banking. Green banking signifies encouraging environment-friendly practices and plummeting carbon footprint by banking activities through various environment friendly acts (Girish, 2015). The Government of Bangladesh controls the Lawachara National Park through Green Banking Accomplishments with need-based bank loan for nursery establishment, home garden development, set-up environmental education centre adjacent the park area to reduce dependency on forest. Therefore, the government expected to take comprehensive goals in order to promote involvement of the Forest Department, Department of Environment, Water and Agricultural Sector. One of their target activities intersects with the improvements dedicated to its unique objectives. In this condition, policy makers should substitute activities in one instrument with damaging activities in other instruments, through a framework which delivers rules and regulations to pertinent performers and stakeholders to accomplish better quality, shown as in Table 4.

4.2. Adequate Policy and Advanced Security

Effectiveness of environmental conservation policy is connected to the capacity of the relevant instrument to complete the policy strategies to achieve the target-oriented results linked to the anticipated objectives of the environmental policy instruments, for example: scarcity of water for wildlife in winter season, tourist guide and wireless network control unit. Wireless Sensor Networks (WSN) affect on customer care services with 19% physical and 81% of psychological changes through radiation pollution and banking transaction with creating false interface. Besides, WSN creates barrier on customer access, coordinates identification and environmental informatics due to lack of dynamic security. The security system indicates according to priority of advanced technology, which as shown in Figure 11.

The study represents the central bank's green banking alertness through constituting scanning, association and connection, evaluation and judgment, which positively influence the key stakeholders. Thompson and Cowton (2004) concluded that banks may be supportive through environmental disclosure practice either voluntarily or by requirement of regulation. The authority of the Banking sector can introduce the activities of Green banking with proper policy and technology, including environmental consciousness, Green financing, Green marketing, Green Income Generating Activities (GIGA), Brick Burning Chimney Controlling Activities and so on. According to the report of BBS (2013), twenty forest nursery and seven brick kilns exist at Kamalganj sub-district, but no horticulture centers are available there. International Standards Organization 14000 is also another global initiative, which is a series of voluntary compliance of standards for environmental practices (Murray *et al*., 1997) through Green Banking activities. Green Banks ensure that a given level of Biodiversity will be maintained while making development possible that might otherwise compromise a species (Bagnoli *et al*., 2008), at least plant or animal species. The study also highpoints on the paces, ingenuities (Stewart, 2006), paybacks and upcoming of national green banking technology in Bangladesh, prospective to further incorporate banking policy within the imminent generations and using technology to stimulate environmental sustainability.

Table 4. Policy effectiveness for Environmental Conservation towards National Park

Target-oriented options	Purpose	Data obtained	Policy Effectiveness
Dynamic co-management	Conservation and security	Time- series data: Weekly /monthly	Stakeholder Engagement
Rain water Harvesting	Protection of Wildlife and plants during odd seasons	Time- series data: Rainy season	Rainwater Harvesting Policy
Removal of Invasive species	Ensure native species protection	Time- series data: Monthly/yearly	Wildlife conservation and security Act , ABT 2020
Afforestation program	Regeneration gap filling	Time- series data: Monthly/yearly	Forestry Policy 1994 and draft policy 2016
Intensive Monitoring systems	Quality Reporting and relevant decision-making	Time- series data: Monthly/quarterly	Clearing House Mechanism and digital conservation
Budget allocation	Dynamic efficiency incentives	Cost-benefit analysis	Cost-effectiveness

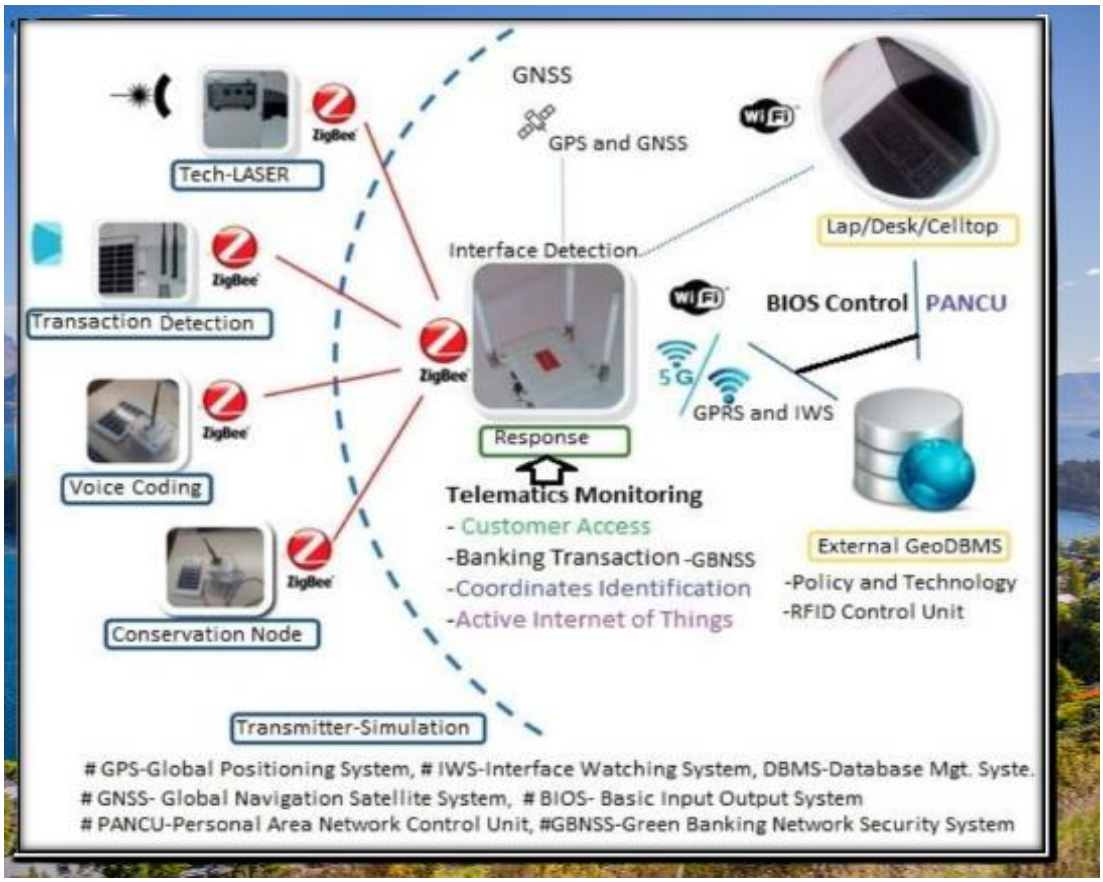

Figure 11. A Framework on Green Banking Network Security Systems

4.3. Major Challenges

Banking sector is the back bone of any economic systems which ensures development through effective channelization of financial resources (IFC, 2012). It is commonly reflected as environment friendly and economically sustainable in terms of emissions, pollutions and degradation catastrophes. The present era of industrialization and globalization indicates a lot of comfort and luxurious life which might lead to an alarming situation of huge environmental degradation, brought about by all the concerning activities. There are some major challenges regarding Green Banking Policy and Technology, such as access to environmental information without Government support, difficulty in launching voluntary emission-reduction projects, stopping lending to traditional high-pollution and high-emission sectors, for example tannery or textile sector, and lack of evidence for the business case (Singh and Singh, 2012, pp. 41–45), which impact on national and environmental problems. The internal environmental impact of the banking sector such as use of natural resources like energy, paper and water are relatively low and clean. Environmental impact of Banks is not tangibly related to their banking operations but with the customer's activities. So, the environmental impacts of a bank's peripheral activities are huge, though difficult to estimate. Additionally, environmental management in the banking business is like risk management. This augments the enterprise value and lowers loss ratio as a higher quality loan portfolio results in higher incomes. For this purpose, inspiring environmentally responsible investments and prudent lending should be one of the responsibilities of the banking sector. So, industries which have previously become green and which are making serious attempts to going green should be bestowed with a higher priority for service by the banks.

5. Conclusions

The study shows that Green Banking is essential to the stakeholders of adjacent Lawachara National Park in Moulvibazar district of Bangladesh. The research focuses on policies, regulations and innovation technology for Green Banking that must shape more stable and efficient financial systems. These are also more connected to the mainstream economy, and the social and environmental changes that relate to domestic green economy. Policy innovations are evolving with great strides, especially in developing and emerging economies. Bangladesh is faced with immediate and long-term, social and environmental changes, and its financial systems are less constrained by prevailing norms and interests. This phenomenon affects sustainable progress which has emerged as the new paradigm for development in response to the discourse of the current development strategies that over-exploit the natural environment for economic prosperity. The policies and technologies of Green

Banking systems are being used in the study to identify and sustain environmental protection in the study areas for the present and future generations, which is essential because it is a user-friendly innovation that helps to address both scientific and social issues around the studied area. Moreover, proper decision is essential for the sustainable development of environmental resources. Further investigations into stabilizing and enriching the policies and technologies of Green Banking are essential in order to successfully implement efforts to promote and harmonize environmental protection at the study area in the north-eastern part of Bangladesh. Last but not least, it is also worth stating, yet again, that for a Central Bank, the Bangladesh Bank, the biggest factor contributing to national financial stability is Green Banking which strengthens sustainable environmental conservation. Finally, we suggest future research trajectories of a new collaborative approach to drive the methodological agenda and recommend further incorporation of Green Banking policy and technology systems along with essential mechanisms in the Banking sectors for sustainable environmental conservation, not only at the national but also the global scale. To achieve an effective environmental conservation policy instrument, comfortable thinking, smart informed decision and knowledge of national park biodiversity are desired. Practical training and guidance, workshops on biodiversity conservation activities and career paths should be conducted for the organizations concerned, co-management team, local communities, officials and the public.

6. Declaration

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Data Availability

The data being used to support the findings of this research work are available from the corresponding author upon request.

Competing Interests

The authors declare no potential conflict of interests in this research work.

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