A Study on the Role of Fintech in Accelerating Green Finance with Reference to Public Sector Banks

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Abstract

The rapid advancement of Financial Technology (Fintech) has created new opportunities to improve the effectiveness, accessibility, and scalability of financial services. Investments that support environmental sustainability, such as carbon reduction programs, renewable energy projects, and sustainable infrastructure development, are referred to as green finance. Public sector banks are in a good position to promote sustainable financial practices because of their extensive reach and important role in financial inclusion. Public sector banks are major players in the Indian banking system. With their vast networks and trust among the public, they have the potential to drive green finance initiatives on a large scale. Through increased transparency, lower transaction costs, and improved risk management, fintech innovations like digital platforms, blockchain and artificial intelligence are reshaping green project financing. This also addresses the obstacles of integrating fintech-driven green finance in public sector banks, including stakeholder ignorance, technological limitations, and regulatory concerns. The objective of the findings is to provide an understanding of how public sector banks can be better positioned to support the shift in the economy and achieve sustainable development by utilising fintech.

Keywords: Green Finance, Fintech, Public Sector Banks, Sustainable Development

Introduction

Green finance is an investment or a loan that is provided for sustainable development. It aims to improve the environment and respond to the climate issues. It includes private and public sector entities, including banks, governments, companies, non-profit organisations and others. Green finance has a variety of initiatives, including the development, execution and promotion of projects with sustainable impacts or business models.

Green finance was introduced in November 2008. Green finance is a financial operation that contributes to the development of the environment. These activities are in the form of loans, investments or other financial instruments. These financial activities are to help towards sustainable initiatives.

Green Finance Product

- Green bonds
- Green loans
- Sustainable mutual funds and Exchange Traded Fund (ETFs)
- Green mortgage
- Green insurance

Fintech refers to the use of technology to improve and automate and use of financial services. It consists of a variety of applications, including mobile payments, online banking, peer-to-peer lending, investment platforms, and uses blockchain technology. The main objective of Fintech is to make financial services easily available, efficient and user-friendly. It includes innovative technologies such as artificial intelligence, big data, and machine learning.. Fintech is a revolution of traditional financial practices, offered to customers and businesses.

Benefits of Fintech

- Convenience: Fintech solutions provide services 24*7 from anywhere with an internet connection.

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- Efficiency: Fintech technology will help processes to minimise the time and cost associated with financial transactions.
- Accessibility: Fintech makes services available all over the country, including remote and inaccessible areas.
- Transparency: Digital platforms provide clear and detailed information about transactions and finance-related matters easily, which helps users to make the right decision.

Challenges and Opportunities Faced by the Adoption of Green Finance. Adopting green finance has its challenges

Challenges

- Regulations: The rules and regulations of green finance differ from area to area. So, it is difficult to follow all the regulations.
- Knowledge Gaps: Public Sector Banks (PSBs) do not have much expertise in green finance projects. A lot of learning and staff training is required to understand and manage the investments, which can be time-consuming and expensive.
- Risk: The Green finance project is risky as it is based on nature. The returns are uncertain with a long payback period. Banks are cautious about their returns.
- Financial constraints: Public sector banks have a lot of constraints with tight budgets and have many priorities. Hence, extra funding for green finance can be challenging.

Opportunities

Support and incentives: Banks provide a lot of support and initiatives for promoting green finance, like tax breaks and subsidies. This initiative makes banks more attractive towards the green finance project.

Growing market demand: People are increasingly looking towards sustainable options, which has created demand for green finance products. Banks being a more attractive option for this project, customers and investors are keen on green finance options.

Boosting reputation: By taking a sustainable project, it will help to increase the reputation of the individual and help banks to enhance their reputation in society. A strong brand image or reputation will attract new customers, investors and partners who value the environment.

- Innovation edge: Investing in green finance can initiate innovations that will help new technology and use robust technology in the field of green finance by leading new financial products and services. This will give a competitive edge in the financial landscape.
- Positive impact: Supporting green finance leads to a positive effect on social and environmental benefits like reducing carbon emissions and improving public health. Banks play a crucial role in the sustainable development and meeting environmental goals.

The Need for Green Finance in Public Sector Banks

Public sector banks play a huge role in the economy and the involvement in green finance. Firstly, they can help fight climate change by funding projects that reduce pollution and promote renewable energy making it easier for countries to meet their climate goals.

Secondly, green finance supports sustainable development, creating jobs and economic growth, which will attract investors to eco-friendly projects.

Thirdly, it helps manage financial risks by diversifying investment away from the traditional sector, like fossil fuels, which are becoming riskier.

Fourthly, public sector banks can promote social equity by funding projects that increase living conditions in underserved communities.

Only by aligning with government sustainability polices ensure they stay compliant and can benefit from government incentives. By leading in green finance, public sector banks set an example for others, drive innovation and ensure long-term sustainable growth, ultimately helping to create a more resilient and prosperous future for everyone.

Role of Fintech in Accelerating Green Finance

Fintech plays a crucial role in accelerating green finance. By creating user-friendly digital platforms, fintech makes it easy for anyone to apply for green loans or invest in sustainable projects right from their phone, regardless of their financial background or location. Crowdfunding and peer-to-peer lending platforms enable people to directly support eco-friendly initiatives, democratizing access to green finance. Fintech has big data and AI to identify the best green investments and monitor their progress in real time, ensuring transparency and impact. Blockchain technology provides a secure, transparent way to track investments, reducing costs and building trust. Automation speeds up processes like loan applications, making green finance faster and more efficient. Innovation products like green bonds, loans and digital tokens lower the entry barriers for sustainable investments, while predictive analytics and smart contracts enhance risk management. Fintech platforms also educate and engage users through resources and gamification, making green finance fun and informative. With the ability to facilitate cross-

border transactions, fintech connects investors with green projects, widely helping to drive a global shift towards sustainability. India has taken a significant step in the area, issuing billions of dollars in green bonds to support the transition to a low–carbon economy. Adding to the introduction of financial technology (fintech) played an important role in access to green investments, and the challenges help in bridging the gap between supply and demand for renewable energy funding.

Impact of Fintech in Accelerating Green Finance

Fintech has helped to access green finance more easily and faster.

- Making green finance accessible to everyone: Digital platforms make it easier to invest in a sustainable project with a few taps on the phone. This has made green finance accessible at the fingertips.
- Big data and AI: Fintech uses smart tech to maintain the data and to provide information about the best green investment opportunities.
- Real-time monitoring: By using Fintech, green projects can be tracked live, ensuring they are performing well and delivering the benefits.
- Cross-border transactions: Fintech makes it easy to finance green projects anywhere in the world by breaking down the geographical barriers and creating impactful initiatives.
- Increasing engagement and awareness: Many Fintech platforms offer all the resources that will help to educate people about the benefits of green finance and how they can get involved. This will enable people to invest more in the green finance project.

The research seeks to explore how fintech contributes to the advancement of green finance, particularly focusing on its significance for public sector banks. Public sector banks encounter diverse challenges, including regulatory gaps and insufficient incentives, which heighten the risk associated with fintech adoption. Moreover, spreading information about green finance poses an additional challenge. Green finance represents a prevailing trend in the financial sector, aiming to foster sustainable economic development.

Literature Review

Dr Kshirod Kumar Pradhan, Rasan Settee (2024). This paper covers how money can help make India more environmentally friendly and sustainable. It also shows how green finance helps in identifying issues and making society better. The paper helps in considering the social factors to make financial decisions. Also focuses on how technology will make sustainable finance goals easier and suggests investing in green projects. It focuses on the risks that make India more economically vulnerable. It also focuses on the various financial instruments that green finance will help in the transformation of India. The green finance will also create awareness about nature in India.

Ms Sneha Banga, Dr Satyendra Arya (2024). This paper focuses on the financial technology will rise in financial services. It helps in focusing on how fintech helps to promote financial inclusion. The data is collected from primary and secondary sources by using statistical tools such as the Chi-Square test. To find out the relationship between fintech adoption towards sustainability development goals and green finance in urban stakeholders, the main objectives of the research are to examine how fintech may help promote environmental sustainability in urban areas. Fintech will help in promoting renewable energy and environmentally friendly infrastructure projects, and help in promoting innovation.

R Agrawal, S Agrawal, Ashutosh (2023). This paper focuses on the use of a hybrid method of connecting bibliometric analysis. It elaborates on the topic of green finance or sustainable finance or social finance, and green innovation. This paper presents the current world of commerce, green finance policies, and green innovation, presenting a new approach to environmental governance that has high financial fines and investment restrictions. By implementing green finance, environmental regulations vary from region to region. The main purpose of the research is to analyse the nexus between green finance and green innovation technologies.

Arushi & Apar Singh (2023). This paper exhibits the aspects of green finance in sustainable development. This paper is based on secondary data. It discusses the green finance products & services like green loans, green bonds, green investment funds, green insurance, and sustainable investment advisory service. To know the difficulties of green finance. This paper covers the environmental challenges we face today by directing financial resources towards sustainable & environmentally friendly projects. It enhances the availability of the Green Financing option for the growth of green finance in India.

Sreenu Nenavath, Shashwat Mishra (2023). This paper focuses on the effects of Green Finance and financial technology that helps with sustainable growth. The paper reveals that quality economic growth impacts financial structure, financial effectiveness, and environmental development. Green finance is finance funds flowing into sustainable development and

initiatives, to assist the sustainable economy. According to this paper, most of the traditional banks lacked both technology and innovation in serving pollution.

Ridhika Chatterjee, Tapsi Srivastava & Nabhject Kaur (2023). The paper focuses on fostering consistent economic growth while additionally encouraging the mobilisation of private capital for the attainment of sustainable development. Further, it emphasises fintech over three eras. The fintech ecosystem's potential benefits and difficulties are also covered in this paper. Observed that fintech has become a platform through which banks can collaborate to enhance the application of financial technology.

From the above literature review, it is understood that many articles revolve around green finance and fintech, sustainable economic growth, and how this will help to develop the economy and work in traditional banks. Few studies have covered about fintech is expediting the advancement of sustainable finance within the private sector banks and PSBs. The private sector banks give a more important to the green or sustainable project for a long-term investment which will improve the productivity and the business also, so from the other research papers it is understood that PSBs are not providing much important to sustainable projects, and also the implementation of fintech in PSBs are less, they still use more paper work than the digital. Hence, the study focuses on understanding the role of fintech in accelerating green finance with reference to public sector banks as given in the Figure 1.

The factors identified for the study

Objectives

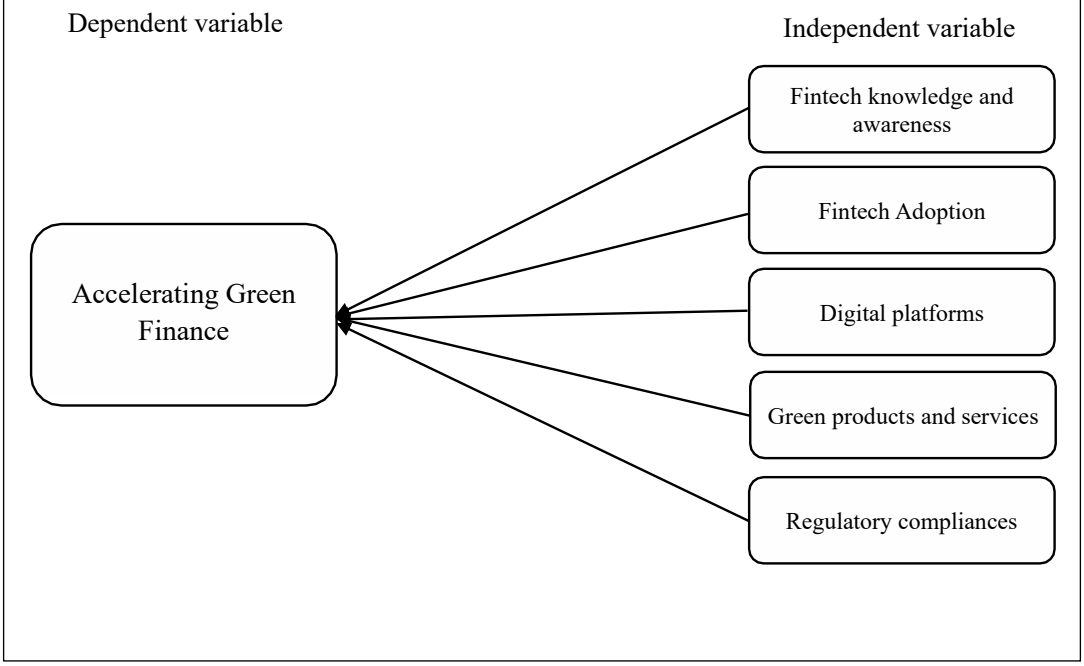
- To understand the role of fintech in accelerating green finance.
- To identify the need for green finance in public sector banks.
- To analyse the impact of fintech in accelerating green finance.
- To examine the challenges and opportunities in the adoption of green finance.

The study has been undertaken to examine the fintech accelerating green finance and its impact on public sector banks. This study is based on the financial innovation in green finance. Collecting the information about the green finance and fintech in PSBs and how it helps environment sustainability. The geographical focus is Bangalore.

Research Methodology

- Type of research: Descriptive Research.
- Type of sampling: Non-probability sampling, i.e convenience sampling.
- Sampling frame: Customers of public sector banks
- Sample size: 115
- Statistical tool: Chi-square test

Figure 1: The factors identified for the study



Source: Author Complied.

- Data collection: Primary data is collected through a questionnaire, and secondary data through government websites, journals and research papers.

Data Analysis and Interpretation

Table 1. Customers' opinion towards the integration of fintech with public sector banks

Parameters	Details		No. of respondentss	Percentage
The significant relationship between fintech implementation and green finance adoption.	Strongly Disagree		6	5.2%
	Disagree	8	7%	
	Neutral	23	20%	
	Agree	73	63.5%	
	Strongly agree	5	4.3%	
The impact of the integration of fintech with the public sector	Strongly Disagree		5	4.3%
	Disagree	3	2.6%	
	Neutral	29	25.2%	
	Agree	70	60.9%	
	Strongly agree	8	7%	
The major challenges you faced in using fintech services for green finance in a public sector bank	Very Unaware		5	4.3%
	Unaware	10	8.7%	
	Neutral	31	27%	
	Aware	66	57.4%	
	Very aware	3	2.6%	
Are you aware of significant technological barriers to implementing fintech in green finance?	Very Unaware		4	3.5%
	Unaware	6	5.2%	
	Neutral	31	27%	
	Aware	69	60%	
	Very aware	5	4.3%	

Source: Through survive.

Table 1 shows the customers responses towards the integration of Fintech with public sector banks and it can be observed that majority of the respondents agree for most of the statements given in the questionnaire.

Hypothesis Testing

Hypothesis:

H0: There is no significant association between Fintech implementation and green finance adoption.

Table 2. Significant relationship between fintech implementation and green finance adoption

Particulars	No of respondents	Percentage (%)
Strongly Disagree	6	5.2%
Disagree	8	7%
Neutral	23	20%
Agree	73	63.5%
Strongly Agree	5	4.3%
Total	115	100

Source: Through survive.

Table 3: Testing of Hypothesis

Particulars	O	E (115/5)	(O-E)	(O-E) ^2	(O-E) ^2/E
Strongly disagree	6	23	-17	289	12.565
Disagree	8	23	-15	225	9.782
Neutral	23	23	0	0	0
Agree	73	23	50	2500	108.695
Strongly agree	5	23	-18	324	14.086
Total	115				145.128

H1: There is a significant association between Fintech implementation and green finance adoption.

Degree of freedom = n-1=5-1=4

Level of significance = 0.05

Table value of level of significance and 4DF=9.488

Calculated value = 145.128

From the above table 3 chi-square test, the calculated value is 145.128, and the table value is 9.488. It is suggested that if the calculated value is greater than the table value, then the H0 (Null Hypothesis) is rejected. Therefore, H0 is rejected; hence, there is a significant relationship between fintech implementation and green finance adoption.

Summary of Findings

- The study is carried out using a structured questionnaire and collects responses from the respondents. The respondents are female (53%) and male (47%). A majority of the respondents are students and employees with an annual income of 3 lakhs to 4 lakhs. As most of the respondents are educated, it provides correct information.

- The responses were thoroughly gathered by the consumers of public sector banks, because the study is built to know the role of fintech in the field of green finance.
- The fintech platforms are easy to access by the consumer, which will save time. There is also a technological barrier which will create problems in understanding and getting information about green finance as mentioned in the table 2.
- It has also been found that there is a lack of technical expertise in the public sector banks, which makes the consumer unaware of more information about new introductions in the field of green finance and its initiatives to the public, which needs to be fixed.
- By adopting financial technology in green finance, the reach of the financial project will help in development of the ecosystem.
- With the support of the public sector banks, it will enhance green projects as people will be more aware of them and try to invest in such projects.

Suggestions

- The public sector banks should be more proactive about advertising or promoting green finance projects on websites and other channels, as it will educate other consumers about the various investment opportunities that are available to invest.
- Based on the survey, people need educational programs to be conducted to give them more information about the green project, especially for the younger generation.
- Public sector banks need to promote the importance of green finance, which will lead to an increase in revenue for the country as well.
- Public sector banks need to continue in educational initiatives, technological advancements, and regulatory alignment to further enhance green finance access and efficiency.
- To reduce the regulatory complaints in the green finance, ensuring environmental innovation and growth.
- It is important to establish clear laws, policies and standards. cooperation between the government and international organisations is required to provide common work.
- Banks should help to improve green finance in decision-making and implement technologies like blockchain for transparent and permanent records.

Conclusion

The study highlights how fintech serves public sector banks in accelerating green funding. Fintech has a chance to prominently increase green funding through the public sector banks through increasing accessibility, efficiency and transparency. Public sector banks have the potential as a main player in the adoption of sustainable finance efforts through the adaptation of cutting-edge technology like blockchain. Artificial intelligence and mobile banking. By accomplishing more in the general environmental goals, which will be strengthened by a regulatory framework. Fintech and green finance are well aware of it, still regular use and greater awareness of the concepts are lacking. It is important to overcome technological difficulties and knowledge gaps through focused educational initiatives and enhanced advertising campaigns. To improve the availability of green finance, public sector banks must further develop their fintech skills and enhance their technological know-how. By doing this encourage more investment in environmentally friendly products and make a substantial contribution to developing the ecosystem. Fintech plays an important role in the finance field as it is easily accessible to the green finance product. The integration of fintech with the public sector banks in the green field promotes the economy towards a more sustainable economy by enhancing the efficiency, reducing expenses, improving transparency and accessing finance. Public sector banks assist green projects, which makes a positive impact worldwide by using technology through fintech.

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