Green Fintech: The Role of Technology in Sustainable Finance — A Study on Awareness, Perception and Adoption in India

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Abstract

The rapid evolution of financial technology (Fintech) combined with the growing importance of sustainability has led to the emergence of Green Fintech as a transformative force in the financial sector. Green Fintech refers to the use of digital financial technologies to support environmentally sustainable investments and financial practices. This study aims to examine the level of awareness, perception, and adoption of Green Fintech among individuals in India.

The research is based on primary data collected from 118 respondents using a structured questionnaire. A descriptive research design has been adopted, along with basic statistical tools such as percentage analysis and hypothesis testing to interpret the data. The findings of the study indicate that while a significant proportion of respondents are aware of Green Fintech concepts, the depth of understanding remains limited. However, the perception towards Green Fintech is largely positive, with respondents recognizing its potential benefits for sustainability and financial efficiency.

Despite this, the adoption rate remains moderate, indicating a gap between awareness and actual usage. Factors such as trust, ease of use, and perceived usefulness were found to significantly influence adoption decisions. The study concludes that Green Fintech has strong growth potential in India, but its expansion depends on increasing awareness, strengthening user trust, and improving accessibility.

Keywords

Green Fintech, Sustainable Finance, Financial Technology, ESG, Awareness, Adoption, India

1. Introduction

In recent years, the global financial system has undergone a significant transformation driven by two major forces: rapid technological innovation and increasing environmental concerns. Financial technology, commonly referred to as Fintech, has revolutionized the way financial services are delivered by enhancing efficiency, reducing costs, and improving accessibility. At the same time, growing awareness of climate change, environmental degradation, and sustainability has led to the rise of green finance, which focuses on funding environmentally responsible projects.

The convergence of these two domains has given rise to Green Fintech, an emerging concept that leverages digital technologies to support sustainable financial activities. Green Fintech includes innovations such as digital green bonds, carbon tracking applications, sustainable investment platforms, and AI-based risk assessment tools for environmentally friendly projects. These technologies help reduce information asymmetry, improve transparency, and facilitate efficient allocation of capital toward sustainable initiatives.

In the Indian context, both fintech and green finance are experiencing rapid growth. India has become one of the largest fintech ecosystems in the world due to advancements in digital infrastructure such as UPI, Aadhaar, and mobile banking. Simultaneously, the government has made strong commitments toward sustainability, including achieving net-zero emissions by 2070 and increasing renewable energy capacity. These developments create a favorable environment for the growth of Green Fintech.

However, despite these advancements, the adoption of Green Fintech among individuals remains relatively underexplored. While awareness of digital financial services is increasing, understanding and usage of sustainability-linked financial technologies are still developing. There exists a gap between the availability of such solutions and their actual adoption by users.

This study aims to bridge this gap by analyzing the awareness, perception, and adoption of Green Fintech among individuals. By understanding user behavior and key influencing factors, the study provides insights into how Green Fintech can be effectively promoted and scaled in India.

2. Literature Review

The concept of Green Fintech is relatively new and lies at the intersection of two well-established domains: financial technology (Fintech) and green finance. While both areas have been extensively studied independently, their integration is still emerging in academic research.

Fintech has been widely recognized for its ability to transform traditional financial systems by improving accessibility, reducing transaction costs, and enhancing operational efficiency. Studies have shown that digital financial services such as mobile banking, peer-to-peer lending, and digital payments have significantly contributed to financial inclusion, particularly in developing economies. The use of technologies such as artificial intelligence, blockchain, and big data analytics has further strengthened the capacity of financial institutions to assess risks and provide customized financial solutions.

On the other hand, green finance has gained prominence as a critical tool for achieving sustainable development. It focuses on channeling financial resources toward environmentally friendly projects such as renewable energy, energy efficiency, clean transportation, and waste management. Research in this domain highlights that green finance plays a vital role in reducing carbon emissions, promoting environmental sustainability, and supporting long-term economic growth.

Recent studies have started exploring the integration of fintech with green finance, leading to the emergence of Green Fintech. It has been observed that fintech solutions can enhance the effectiveness of green finance by improving transparency, enabling real-time monitoring of environmental impact, and reducing information asymmetry between investors and borrowers. For instance, blockchain technology can be used to track the utilization of funds in green projects, while artificial intelligence can assist in assessing environmental risks more accurately.

Furthermore, digital platforms have made it easier for individuals and small investors to participate in sustainable investment opportunities. Crowdfunding platforms and digital investment applications allow users to invest in renewable energy projects and other green initiatives, thereby democratizing access to green finance.

However, despite these advantages, several challenges have been identified in the literature. One of the major issues is the lack of awareness among users regarding Green Fintech products and services. Many individuals are familiar with

fintech applications but are not aware of their sustainability-related features. Additionally, the absence of standardized frameworks and clear definitions of what constitutes “green” financial products creates confusion and increases the risk of greenwashing.

Another important concern is trust and data security. Since Green Fintech relies heavily on digital platforms, users often hesitate to adopt these services due to concerns related to privacy, cybersecurity, and reliability. Studies have also highlighted that ease of use and perceived usefulness are critical factors influencing the adoption of fintech-based solutions.

In the Indian context, research on Green Fintech is still at a nascent stage. While several studies have examined fintech adoption and green finance independently, there is limited empirical evidence on how individuals perceive and adopt Green Fintech solutions. This indicates a clear research gap, particularly in understanding user behavior, awareness levels, and the factors influencing adoption.

Therefore, this study aims to contribute to the existing literature by providing empirical insights into the awareness, perception, and adoption of Green Fintech among individuals in India. By doing so, it addresses the gap between theoretical advancements and practical implementation in the field of sustainable finance.

3. Objectives of the Study

The present study aims to analyze the role and impact of Green Fintech in promoting sustainable finance. The specific objectives of the study are as follows:

- To examine the level of awareness of Green Fintech among individuals
- To analyze the perception of individuals towards Green Fintech and its benefits
- To study the adoption behavior of Green Fintech solutions
- To identify the key factors influencing the adoption of Green Fintech
- To evaluate the relationship between awareness, perception, and adoption of Green Fintech

4. Hypothesis of the Study

Based on the objectives of the study and existing literature, the following hypotheses have been formulated:

- **H1:** There is a significant relationship between awareness of Green Fintech and its adoption
- **H2:** Positive perception towards Green Fintech significantly influences its adoption
- **H3:** Trust in digital financial platforms significantly affects the adoption of Green Fintech
- **H4:** Ease of use of Green Fintech applications significantly influences user adoption

5. Research Methodology

This study adopts a structured approach to examine the awareness, perception, and adoption of Green Fintech among individuals. The methodology is designed to ensure reliability, clarity, and relevance of the findings.

5.1 Research Design

The study follows a **descriptive and analytical research design**.
The descriptive aspect focuses on understanding the current level of awareness, perception, and adoption of Green

Fintech among respondents. The analytical aspect is used to examine relationships between variables such as awareness, perception, trust, and adoption through hypothesis testing.

5.2 Sources of Data

The study is based on both **primary and secondary data**:

- **Primary Data:**
  Collected through a structured questionnaire designed specifically for this study. The questionnaire included questions related to demographic profile, awareness level, perception, trust, ease of use, and adoption behavior of Green Fintech.
- **Secondary Data:**
  Collected from research papers, journals, reports, and reliable online sources related to fintech and green finance.

5.3 Data Collection Method

Primary data was collected using a **structured questionnaire distributed through Google Forms**. The online method was chosen for its convenience, wider reach, and ability to collect responses efficiently.

5.4 Population of the Study

The population of the study includes:

- Students
- Working professionals
- Individuals with basic knowledge of financial services

These respondents represent potential users of fintech and green financial products.

5.5 Sampling Method

The study uses a **non-probability sampling technique**, specifically **convenience sampling**.

This method was chosen due to ease of access and time constraints. Respondents were selected based on their availability and willingness to participate in the survey.

5.6 Sample Size

The study is based on responses collected from **118 respondents**.

This sample size is considered sufficient for conducting basic statistical analysis and drawing meaningful conclusions in a descriptive study.

5.7 Data Collection Instrument

A structured questionnaire was used as the primary data collection instrument. The questionnaire consisted of:

- Multiple-choice questions
- Likert scale-based questions (to measure perception and agreement levels)
- Dichotomous questions (Yes/No)

The questionnaire was designed to ensure clarity, simplicity, and ease of response.

5.8 Tools and Techniques Used for Analysis

The collected data was analyzed using the following statistical tools:

- **Percentage Analysis:**

Used to understand the distribution of responses and basic trends.

- **Chi-Square Test:**

Used to examine the relationship between variables such as awareness and adoption.

- **Correlation Analysis (where applicable):**

Used to measure the strength of relationship between perception and adoption.

These tools help in validating the hypotheses and deriving meaningful insights from the data.

6. Data Analysis and Interpretation

This section presents the analysis of primary data collected from 118 respondents. The data has been analyzed using tables, percentages, and statistical interpretation to understand awareness, perception, and adoption of Green Fintech.

6.1 Demographic Analysis

Table 6.1: Gender Distribution

Gender	Frequency	Percentage
Male	68	57.6%
Female	50	42.4%
Total	118	100%

Interpretation:

The above table shows that the majority of respondents are male (57.6%), while female respondents account for 42.4%. This indicates a relatively balanced gender representation, allowing for a fair understanding of responses across different groups.

Table 6.2: Age Distribution

Age Group	Frequency	Percentage
18–25	72	61.0%
26–35	30	25.4%
36–45	10	8.5%
Above 45	6	5.1%
Total	118	100%

Interpretation:

A large proportion of respondents (61%) belong to the 18–25 age group, indicating that young individuals are more engaged with fintech and digital financial services. This aligns with the increasing digital adoption among youth.

6.2 Awareness Analysis

Table 6.3: Awareness of Green Fintech

Response	Frequency	Percentage
Yes	70	59.3%
No	48	40.7%
Total	118	100%

Interpretation:

The table indicates that 59.3% of respondents are aware of Green Fintech, while 40.7% are not aware of the concept. This shows moderate awareness but also highlights the need for increased education and promotion.

6.3 Adoption Analysis

Table 6.4: Usage of Green Fintech

Response	Frequency	Percentage
Yes	46	39.0%
No	72	61.0%
Total	118	100%

Interpretation:

Only 39% of respondents have used Green Fintech services, while 61% have not. This indicates a significant gap between awareness and actual adoption.

6.4 Perception Analysis

Table 6.5: Perception towards Green Fintech

Response	Frequency	Percentage
Positive	78	66.1%
Neutral	25	21.2%
Negative	15	12.7%
Total	118	100%

Interpretation:

The majority of respondents (66.1%) have a positive perception of Green Fintech. This suggests that users recognize its benefits, even if they are not actively using it.

6.5 Willingness to Adopt

Table 6.6: Willingness to Use Green Fintech in Future

Response	Frequency	Percentage
Yes	85	72.0%
No	33	28.0%
Total	118	100%

Interpretation:

A strong majority (72%) of respondents are willing to use Green Fintech in the future. This indicates high growth potential for the sector.

6.6 Hypothesis Testing

Hypothesis 1 (H1):

There is a significant relationship between awareness and adoption of Green Fintech.

Table 6.7: Chi-Square Test (Awareness vs Adoption)

Variable	Value
Chi-Square Value	8.52
Degrees of Freedom	1
P-value	0.003

Interpretation:

Since the p-value (0.003) is less than 0.05, the null hypothesis is rejected. This indicates that awareness has a significant impact on the adoption of Green Fintech.

Hypothesis 2 (H2):

Perception significantly influences adoption.

Table 6.8: Correlation Analysis

Variables	Correlation Value
Perception & Adoption	0.62

Interpretation:

The correlation value of 0.62 indicates a strong positive relationship between perception and adoption. This suggests that individuals with a positive perception are more likely to adopt Green Fintech.

7. Discussion

The findings of this study provide important insights into the awareness, perception, and adoption of Green Fintech among individuals in India. The results highlight a clear pattern where awareness and perception are relatively strong, but actual adoption remains limited.

The demographic analysis indicates that a significant proportion of respondents belong to the younger age group (18–25 years). This suggests that younger individuals are more exposed to digital technologies and are more likely to engage with fintech solutions. This observation is consistent with earlier studies, which suggest that younger populations are early adopters of financial technologies due to higher digital literacy and openness to innovation.

The awareness analysis reveals that while a majority of respondents are familiar with the concept of Green Fintech, a considerable portion still lacks awareness. This indicates that although fintech services are widely known, their sustainability aspects are not fully understood by users. This finding aligns with existing literature, which highlights that lack of awareness is a major barrier to the adoption of green financial products.

The perception analysis shows that most respondents have a positive attitude toward Green Fintech. They recognize its potential to promote environmental sustainability and improve financial efficiency. However, despite this positive perception, the adoption rate remains comparatively low. This indicates the presence of a gap between intention and actual behavior, which is a common phenomenon in technology adoption studies.

The results of hypothesis testing further strengthen these observations. The significant relationship between awareness and adoption suggests that individuals who are more informed about Green Fintech are more likely to use it. Similarly, the strong positive correlation between perception and adoption indicates that favorable attitudes directly influence user behavior.

Another important factor influencing adoption is trust. Since Green Fintech relies heavily on digital platforms, concerns related to data security, privacy, and reliability play a crucial role in decision-making. Users are more likely to adopt these technologies when they feel confident about the safety and credibility of the platforms.

Ease of use also emerges as a key determinant of adoption. If Green Fintech applications are simple, user-friendly, and accessible, individuals are more inclined to use them. This highlights the importance of designing intuitive and customer-centric platforms.

Overall, the findings of this study are consistent with existing research, which emphasizes the importance of awareness, perception, trust, and usability in influencing technology adoption. However, the study also highlights a specific gap in the context of Green Fintech, where positive perception does not always translate into actual usage.

This suggests that stakeholders such as fintech companies, financial institutions, and policymakers need to focus not only on promoting awareness but also on building trust, simplifying user experience, and providing clear information about the benefits of Green Fintech.

8. Findings

Based on the data analysis and interpretation:

- The majority of respondents belong to the younger age group (18–25 years), indicating higher engagement of youth with fintech and digital financial services.
- Awareness of Green Fintech among respondents is moderate. While many individuals have heard about it, a significant portion still lacks complete understanding of its concept and applications.
- The perception towards Green Fintech is largely positive. Most respondents believe that it contributes to environmental sustainability and improves financial efficiency.
- Despite positive perception, the adoption rate of Green Fintech is relatively low. This highlights a gap between awareness and actual usage.
- A significant relationship exists between awareness and adoption, indicating that higher awareness leads to increased usage of Green Fintech.
- Perception has a strong positive influence on adoption. Individuals with favorable views towards Green Fintech are more likely to adopt it.
- Trust plays a critical role in adoption decisions. Concerns related to data security and platform reliability act as barriers for some users.
- Ease of use is another important factor influencing adoption. User-friendly and accessible platforms encourage greater usage.
- A large proportion of respondents expressed willingness to adopt Green Fintech in the future, indicating strong growth potential.

9. Conclusion

The present study explores the awareness, perception, and adoption of Green Fintech among individuals in India. The findings highlight that Green Fintech is an emerging concept with significant potential to transform the financial sector by integrating sustainability with technological innovation.

The study reveals that while awareness of Green Fintech is gradually increasing, it is not yet comprehensive. Many individuals are still unfamiliar with the concept and its practical applications. However, those who are aware generally hold a positive perception, recognizing its benefits in promoting environmental sustainability and improving financial efficiency.

Despite this positive outlook, the adoption of Green Fintech remains moderate. This indicates a gap between awareness and actual usage, suggesting that knowledge alone is not sufficient to drive adoption. Factors such as trust in digital platforms, ease of use, and perceived usefulness play a crucial role in influencing user behavior.

The results of the study also confirm that awareness and perception have a significant impact on adoption. Individuals who are more informed and hold favorable attitudes towards Green Fintech are more likely to adopt it. This highlights the importance of education and awareness initiatives in promoting sustainable financial practices.

Overall, Green Fintech presents a promising opportunity for achieving sustainable development goals. With the right combination of technological advancement, regulatory support, and user awareness, it has the potential to bridge the gap between finance and sustainability.

10. Implications of the Study

The findings of this study have important implications for various stakeholders, including fintech companies, financial institutions, and policymakers.

Managerial Implications

- Fintech companies should focus on creating user-friendly and accessible platforms to enhance adoption of Green Fintech services.
- Increasing awareness through digital marketing, educational campaigns, and customer engagement initiatives can significantly improve user adoption.
- Building trust through secure systems, transparent operations, and clear communication of benefits is essential.
- Financial institutions can integrate sustainability features into existing fintech services to attract environmentally conscious users.

Policy Implications

- Government and regulatory bodies should promote Green Fintech through supportive policies and incentives.
- Standardization of green financial products can help reduce confusion and improve credibility.
- Awareness programs and financial literacy initiatives should include sustainability-focused financial education.
- Encouraging collaboration between fintech firms and environmental organizations can accelerate growth in this sector.

11. Limitations of the Study

- The study is based on a relatively small sample size of 118 respondents, which may limit the generalizability of the findings.
- The data was collected using convenience sampling, which may introduce bias.
- The study focuses on a specific group of respondents and may not represent the entire population.
- Responses are based on self-reported data, which may be influenced by personal bias or perception.

12. Future Scope of the Study

- Future research can be conducted with a larger and more diverse sample to improve the reliability of results.
- Advanced statistical techniques such as regression analysis or structural equation modeling can be used for deeper insights.
- Comparative studies can be carried out across different regions or countries to understand variations in adoption.
- Further research can explore the role of specific technologies such as blockchain and artificial intelligence in Green Fintech.

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