

SUSTAINABLE PRACTICES IN DIGITAL BANKING: STRENGTHENING FINANCIAL INCLUSION IN INDIA**Dr. Kajal Bhojwani**

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ABSTRACT

Digital banking has ushered in a new era, transforming how individuals' access and use financial services. Along with greater convenience and lower costs, this shift has brought sustainability to the forefront. As technology evolves, financial institutions increasingly adopt digital, data-driven models making responsible, resource-efficient, and sustainable practices essential for the future of banking. This study explores how sustainable practices in digital banking can enhance financial inclusion, especially for underserved and first-time users. It highlights practical measures such as paperless onboarding, secure digital transactions, energy-efficient operations, and technology-enabled customer support, which work together to build a more sustainable and accessible digital banking ecosystem. Using insights drawn from a small online survey and brief interviews, the study captures the experiences of women account holders, senior citizens, and new digital users. The findings suggest that digital banking has significantly reduced physical and procedural barriers, enabling individuals to engage more confidently with formal financial systems. However, gaps in digital literacy, limited awareness, and data security concerns still restrict wider adoption. The paper concludes with actionable recommendations emphasizing need for user-friendly digital interfaces, targeted financial education, community-based digital support, and institution-level sustainability strategies to strengthen the role of digital banking in building an inclusive, responsible, and future-ready financial landscape for India.

Keywords: Digital Banking, Sustainability, Financial Inclusion, Consumer Experience, Digital Literacy.

1. INTRODUCTION

The banking sector is undergoing a profound transformation driven by rapid digitalisation, changing consumer expectations, and growing concerns around sustainability and inclusive growth. In India, digital banking has moved beyond being a technological convenience to becoming a strategic instrument for financial inclusion, efficiency, and responsible economic development. The convergence of digital finance and sustainability has gained particular significance in the context of emerging economies, where expanding access to formal financial systems must be achieved alongside environmental and social responsibility.

Traditional banking systems are characterised by extensive reliance on physical infrastructure, paper-based processes, and repeated customer visits, resulting in high operational costs and environmental footprints. Digital banking, by contrast, enables paperless transactions, remote access, and streamlined service delivery, thereby offering opportunities to reduce resource consumption while enhancing outreach. When aligned with sustainability principles, digital banking has the potential to support not only economic efficiency but also social equity by reaching underserved and first-time users.

India presents a unique landscape for examining this intersection. While the country has witnessed unprecedented growth in digital payment platforms, mobile banking applications, and technology-enabled financial services, access and effective usage remain uneven. Women, senior citizens, and individuals with limited digital exposure continue to face challenges related to digital literacy, trust, and perceived security risks. These barriers underscore the need to assess digital banking not merely in terms of adoption rates but through the lens of sustainable and inclusive user experiences.

Existing research has extensively examined digital banking adoption and financial inclusion as separate domains. However, limited attention has been paid to how sustainable digital banking practices such as paperless onboarding, secure digital transactions, and technology-enabled customer support shape inclusion outcomes and user confidence in the Indian context. Addressing this gap is critical for understanding how digital banking can evolve into a resilient and inclusive financial ecosystem.

Against this backdrop, the present study seeks to analyse the role of sustainable practices in digital banking in strengthening financial inclusion in India. By integrating sustainability considerations with user-centric

inclusion outcomes, the paper aims to contribute to ongoing academic and policy discussions on building a future-ready, responsible, and inclusive digital banking framework.

2. RESEARCH FRAMEWORK

2.1 Objectives of the study

The specific objectives of the study are as follows:

1. To examine the key sustainable practices adopted in digital banking in the Indian context.
2. To analyse the role of sustainable digital banking practices in enhancing financial inclusion.
3. To assess how digital banking reduces physical, procedural, and access-related barriers for underserved user groups.
4. To identify challenges that limit the inclusive potential of digital banking despite sustainability-driven initiatives.

2.2 Research Questions

In line with the above objectives, the study seeks to address the following research questions:

1. What are the major sustainability-oriented practices integrated into digital banking systems in India?
2. How do these practices contribute to improving access, ease of use, and confidence among digital banking users?
3. In what ways does digital banking facilitate financial inclusion for women, senior citizens, and first-time users?
4. What challenges and gaps persist in leveraging digital banking as a sustainable and inclusive financial tool?

2.3 HYPOTHESIS

To empirically examine the relationships outlined in the research framework, the following hypotheses are formulated:

Hypothesis 1

- **Null Hypothesis (H₀):** Sustainable digital banking practices do not have a significant impact on financial inclusion outcomes in India.
- **Alternative Hypothesis (H₁):** Sustainable digital banking practices have a significant impact on financial inclusion outcomes in India.

Hypothesis 2

- **Null Hypothesis (H₀):** The adoption of digital banking does not present significant sustainability-related benefits and challenges for users.
- **Alternative Hypothesis (H₂):** The adoption of digital banking presents significant sustainability-related benefits and challenges for users.

Hypothesis 3

- **Null Hypothesis (H₀):** Factors such as digital literacy, perceived security, ease of use, and awareness do not significantly influence the inclusive adoption of digital banking.
- **Alternative Hypothesis (H₃):** Factors such as digital literacy, perceived security, ease of use, and awareness significantly influence the inclusive adoption of digital banking.

2.4 RESEARCH METHODOLOGY

The study adopts a descriptive and analytical research design to examine the role of sustainable practices in digital banking and their influence on financial inclusion in India. A mixed-method approach is employed to capture both measurable adoption patterns and user perceptions related to digital banking usage in Thane District. Primary data were collected from 300 respondents through a structured questionnaire administered to

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digital banking users, focusing on variables such as frequency of usage, perceptions of sustainability-oriented practices (paperless transactions, digital onboarding, security features), and indicators of financial inclusion including access, ease of use, and confidence in engaging with digital financial services.

In addition, secondary data were sourced from published academic literature, reports of the Reserve Bank of India (RBI), government publications, and institutional studies to provide contextual grounding and support analytical interpretation. The sample includes women account holders, senior citizens, and first-time digital banking users to reflect inclusion-focused perspectives.

Data were analysed using descriptive statistics and basic inferential techniques to examine relationships between sustainable digital banking practices and financial inclusion outcomes.

3. LITERATURE REVIEW

Digital banking has emerged as a transformative force in modern financial systems, reshaping how financial services are accessed, delivered, and experienced. Recent studies emphasise that digital banking significantly enhances financial inclusion by reducing transaction costs, eliminating geographical barriers, and simplifying access to formal financial services (Demiurguc-Kunt et al., 2022). In emerging economies such as India, the expansion of mobile banking applications, digital payment systems, and digital KYC processes has contributed to increased account ownership and transaction activity, particularly among previously underserved populations (Reserve Bank of India, 2023).

Alongside financial inclusion, sustainability has gained prominence as a critical dimension of digital banking. Scholars argue that digital banking contributes to environmental sustainability by reducing paper-based documentation, minimising reliance on physical bank branches, and lowering energy consumption and carbon emissions associated with traditional banking operations (OECD, 2021). From a social sustainability perspective, digital banking promotes transparency, ethical service delivery, and equitable access to financial services, while economically, it enables cost efficiency and scalable service models (Bansal & Song, 2023). Recent literature increasingly recognises that sustainability-oriented digital practices play an important role in strengthening institutional trust and long-term user engagement.

However, despite these advantages, the literature consistently highlights challenges that limit the inclusive potential of digital banking. Digital literacy gaps, limited access to digital infrastructure, cybersecurity concerns, and usability issues continue to hinder adoption, particularly among women, senior citizens, and first-time digital users (Ghosh & Chaudhury, 2021; World Bank, 2022). Recent empirical and review-based studies further caution that without user-centric design and targeted digital education initiatives, digital banking may exacerbate exclusion rather than mitigate it (Rahman et al., 2024; Sengupta, 2025). These findings suggest that access alone is insufficient; the quality, safety, and sustainability of digital banking experiences are equally critical.

Recent systematic reviews reinforce the need to examine digital banking through an integrated lens that combines financial inclusion and sustainability outcomes. Studies published in the last two years emphasise that sustainable digital banking practices such as secure digital transactions, responsible data management, and inclusive platform design are essential for achieving equitable and long-term inclusion (Dao, 2025; Sajid et al., 2024). The literature therefore calls for more context-specific research, particularly in developing economies, to understand how sustainability-oriented digital banking practices influence user confidence, continuity of usage, and inclusive financial participation.

3.1 RESEARCH GAP AND NEED FOR THE STUDY

Although extensive research exists on digital banking adoption and financial inclusion, limited studies integrate sustainability as a central analytical perspective. Much of the existing literature focuses on technological adoption or efficiency metrics, with insufficient attention to how sustainable digital banking practices shape user trust, confidence, and inclusion outcomes. Furthermore, research that explicitly captures the experiences of vulnerable user groups such as women, senior citizens, and first-time digital banking users within the Indian context remains scarce. Addressing this gap is essential for understanding how digital banking can evolve into a sustainable, inclusive, and user-centric financial ecosystem. The present study seeks to bridge this gap by

analysing the role of sustainable practices in digital banking as a strategic pathway to strengthening financial inclusion in India.

4. FINDINGS AND ANALYSIS

4.1 Analysis

Table 1: Classification of Respondents Based on Demographic and Digital Banking Characteristics (n = 300)

Basis of Classification	Category	Frequency	Percentage (%)
Gender	Male	162	54.0
	Female	138	46.0
Age Group	Below 30 years	78	26.0
	30–50 years	140	46.7
	Above 50 years (Senior Citizens)	82	27.3
Digital Banking Experience	First-time users	100	33.4
	Experienced users	200	66.6

Table 2: Frequency of Digital Banking Usage by Gender

Frequency	Male	Female	Total
Daily	52	44	96
Weekly	60	54	114
Occasionally	36	30	66
Rarely	14	10	24
Total	162	138	300

Table 3: Perception of Sustainable Digital Banking Practices by User Experience

Sustainable Practice	First-Time Users (Mean)	Experienced Users (Mean)
Paperless transactions	4.18	4.33
Digital onboarding / e-KYC	4.05	4.24
Secure authentication features	4.21	4.42
Reduced branch dependency	3.96	4.14

Table 4: Financial Inclusion Outcomes by Age Group

Indicator	Below 30	30–50	Senior Citizens
Ease of access	4.35	4.28	3.92
Confidence in digital transactions	4.26	4.19	3.86
Financial independence	4.18	4.11	3.79
Reduction in transaction barriers	4.30	4.24	3.88

Table 5: Challenges Faced in Digital Banking by User Group (%)

Challenges	Female Users	Senior Citizens	First-Time Users
Cybersecurity concerns	39.1	53.6	41.8
Lack of digital literacy	29.4	47.5	45.2
Difficulty navigating apps	26.8	50.1	38.6
Dependence on assistance	22.5	55.3	43.1

Table 6: Relationship Between Sustainable Practices and Financial Inclusion

Variables	Correlation (r)	Significance
Sustainable practices & ease of access	0.61	p < 0.01
Sustainable practices & user confidence	0.58	p < 0.01
Sustainable practices & usage frequency	0.64	p < 0.01

4.2 FINDINGS AND HYPOTHESIS TESTING

The findings of the study are derived from the descriptive and inferential analysis of primary data collected from 300 digital banking users in Thane District. The analysis focuses on the relationship between sustainable digital banking practices and financial inclusion outcomes, while also examining adoption challenges across different user groups.

(Hypothesis 1) Impact of Sustainable Digital Banking on Financial Inclusion

The analysis indicates a strong positive impact of sustainable digital banking practices on financial inclusion. High mean scores were observed for ease of access, confidence in digital transactions, and reduction in transaction-related barriers (Table 4). Correlation analysis further reveals a statistically significant positive relationship between sustainability-oriented digital practices and key inclusion indicators such as ease of access ($r = 0.61, p < 0.01$) and user confidence ($r = 0.58, p < 0.01$) (Table 6). These findings suggest that features such as paperless transactions, digital onboarding, and secure authentication mechanisms enhance users' engagement with formal banking services.

Since the relationship between sustainable digital banking practices and financial inclusion indicators is statistically significant, the **null hypothesis (H_0) is rejected**, and the **alternative hypothesis (H_1) is accepted**. This confirms that the current implementation of sustainable digital banking practices significantly impacts financial inclusion outcomes.

(Hypothesis 2) Challenges and Opportunities in Digital Banking Adoption

The study identifies both opportunities and challenges in the adoption of digital banking services. While frequent usage patterns indicate high acceptance (Table 2), challenges such as cybersecurity concerns, lack of digital literacy, and application usability issues remain prevalent, particularly among senior citizens and first-time users (Table 5). Despite these challenges, the overall perception of sustainable digital practices remains favourable across user groups, indicating significant scope for inclusive growth if adoption barriers are addressed.

Given the presence of clearly identifiable challenges alongside notable opportunities, the **null hypothesis (H_0) is rejected**, and the **alternative hypothesis (H_2) is accepted**. The findings confirm that the adoption of digital banking presents significant challenges as well as opportunities.

(Hypothesis 3) Factors Influencing Adoption of Digital Banking

User experience, perceived security, ease of use, and sustainability-oriented features emerge as significant factors influencing digital banking adoption. First-time users reported comparatively lower confidence levels, while senior citizens expressed greater difficulty in navigating digital interfaces (Tables 3 and 4). Conversely, experienced users and female respondents demonstrated higher levels of usage frequency and perceived convenience. The positive correlations between sustainable practices and frequency of usage further validate the role of these factors in driving adoption (Table 6).

As multiple user-centric and sustainability-related factors significantly influence adoption behaviour, the **null hypothesis (H_0) is rejected**, and the **alternative hypothesis (H_3) is accepted**. This indicates that identified factors play a crucial role in influencing the adoption of digital banking services.

5. DISCUSSION

The findings of the study indicate that sustainable digital banking practices play a significant role in strengthening financial inclusion by enhancing accessibility, user confidence, and continuity of usage. Features such as paperless transactions, digital onboarding, and secure authentication mechanisms reduce procedural barriers and encourage routine engagement with formal banking services. These results are consistent with earlier studies that emphasise the role of digital finance in expanding access and reducing transaction-related constraints (Demirgüç-Kunt et al., 2022; RBI, 2023).

The study further reveals meaningful variations across demographic and experiential dimensions. Women users reported greater autonomy and ease in managing financial transactions, suggesting that digital banking supports inclusive participation and financial independence. In contrast, senior citizens and first-time users expressed higher concerns regarding cybersecurity, digital literacy, and application usability, highlighting the persistence of trust and capability barriers. These findings reinforce recent literature that stresses the importance of user-centric design and digital literacy initiatives in achieving inclusive and sustainable digital banking outcomes (Rahman et al., 2024; Sengupta, 2025).

Importantly, the positive association between sustainability-oriented digital practices and financial inclusion outcomes suggests that inclusion is not driven by access alone, but by the quality, safety, and ethical orientation of digital banking experiences. By integrating sustainability into digital banking, financial institutions can

strengthen long-term trust and adoption, particularly among underserved user groups. Thus, the study contributes to the growing discourse that positions sustainability as a strategic enabler of inclusive digital finance in emerging economies.

6. CONCLUSION

The study concludes that sustainable digital banking practices significantly influence financial inclusion by improving access, enhancing user confidence, and encouraging consistent engagement with formal financial services. The empirical findings confirm that features such as paperless processes, secure digital transactions, and simplified onboarding contribute positively to inclusion outcomes. While adoption levels are high, challenges related to digital literacy, usability, and security perceptions persist, particularly among senior citizens and first-time users. Overall, the study establishes that sustainability-oriented digital banking is a critical pathway for building an inclusive, trust-based, and resilient financial ecosystem in India.

7. SUGGESTIONS

Based on the findings, banks and financial institutions should prioritise **user-centric design**, with simplified interfaces and assisted digital support for senior citizens and first-time users. Targeted **digital literacy and awareness programmes** can help reduce apprehension and improve confidence in digital transactions. Strengthening **cybersecurity communication and transparency** is essential to address trust concerns and encourage sustained usage. Policymakers and regulators should promote sustainability-driven digital banking frameworks that balance innovation with inclusion, ensuring that digital transformation contributes meaningfully to equitable financial participation.

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