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Research Article

Banking For a Greener Future: Exploring Customer Adoption of Green Banking Services

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Abstract

Green banking means using banking services which saves paper, time, and other resources while reducing harm to the environment. Services such as internet banking, mobile banking, digital payments, e-statements, and online fund transfers support green banking. This study examines the awareness, usage, satisfaction, and difficulties related to green banking services among bank customers in Kannur district, Kerala. The study adopted a descriptive and empirical research design. Primary data were collected from 60 respondents using a structured questionnaire and convenience sampling. Percentage, weighted average, Mann-Whitney U test, Kruskal-Wallis's test, and Spearman's rank correlation were used for analysis. The findings show that the overall awareness of green banking services was moderate, with a mean score of 2.243. Internet banking had the highest awareness, while green financing had the lowest. Green/eco-friendly loans were the most used service (40.00%). The overall perception of green banking was positive, with a weighted average of 2.432. Awareness had a significant positive relationship with usage ($p = 0.431$, $p < 0.001$). Overall satisfaction was also positive, with a weighted average of 2.372, and usage had a significant positive relationship with satisfaction ($p = 0.330$, $p = 0.010$). Transaction failure or delay was the major difficulty faced by respondents. Difficulties had a significant negative relationship with satisfaction ($p = -0.155$, $p = 0.038$). The study suggests that banks should improve digital facilities, strengthen security, increase customer awareness, and provide better support to promote wider adoption of green banking services.

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KEYWORDS: Green Banking, Awareness, Usage, Satisfaction, Difficulties, Digital Banking

1. INTRODUCTION

Green banking means using banking services in a way that saves paper, time, and other resources while reducing harm to the environment. Services such as internet banking, mobile banking, digital payments, e-statements, and online fund transfers support green banking. These services make banking faster and more convenient for customers. However, some customers may still have limited awareness or face problems such as poor internet connectivity, security concerns, and technical issues. Therefore, this study examines the awareness, usage, satisfaction, and difficulties related to green banking services among customers in Kannur district.

2. LITERATURE REVIEW

Weber (2010) examined sustainable banking and the role of financial institutions. The study found that banks can support environmental and social development through responsible financial activities. It highlighted sustainability as an important part of modern banking.

Biswas (2011) examined the concept of sustainable banking. He explained that banks can support environmental protection through green products and responsible financial activities. Moreover, banks have an important role in promoting sustainable development.

Rajput et al. (2013) studied green banking practices in Indian banks and found that banks were gradually adopting environmentally friendly practices. They suggested that stronger policies and better implementation were needed to improve green banking.

Kumar and Prakash (2014) studied green banking practices in India. The study explained that banks can support sustainable development through green loans and environmentally friendly services. It also highlighted the need for responsible banking practices.

Singh and Singh (2020) examined awareness and usage of green banking services. The study found that digital banking makes transactions easier and reduces paper-based activities. It also showed that better awareness can encourage customers to use green banking services.

Rehman et al. (2020) studied green banking and sustainable development. The study found that digital banking and green financial products can help reduce environmental impact. It also highlighted the importance of customer awareness and participation.

Statement of the Problem and Significance of the Study

Green banking is becoming more important as banks increasingly use digital and paperless services. However, customers may have different levels of awareness, usage, and satisfaction with these services. They may also face problems such as poor internet connection, security concerns, and

transaction delays. Therefore, this study examines the awareness, usage, satisfaction, and difficulties related to green banking services among bank customers in Kannur district. The study is useful for understanding customer needs and helping banks improve their green banking services.

3. OBJECTIVES

1. To assess the level of awareness of green banking services among respondents in Kannur district.
2. To assess the level of satisfaction with green banking services.
3. To identify the major difficulties faced while using green banking services.
4. To examine the relationship between usage and satisfaction with green banking services.
5. To examine the relationship between difficulties faced and satisfaction with green banking services.

Hypotheses

H₀₁: There is no significant difference in awareness between male and female respondents.

H₀₂: There is no significant difference in awareness based on the educational level of respondents.

H₀₃: There is no significant relationship between awareness and usage of green banking services.

H₀₄: There is no significant difference in satisfaction with green banking services between male and female respondents.

H₀₅: There is no significant difference in satisfaction with green banking services based on the type of bank.

H₀₆: There is no significant relationship between usage and satisfaction with green banking services.

H₀₇: There is no significant difference in the difficulties faced by male and female respondents in using green banking services.

H₀₈: There is no significant difference in the challenges faced by respondents based on the type of bank.

H₀₉: There is no significant relationship between difficulties faced and satisfaction with green banking services.

4. METHODOLOGY

The study was conducted in Kannur district, Kerala. It examined awareness, usage, satisfaction, and difficulties related to green banking services. The study followed a descriptive and empirical research design. Primary data were collected from 60 respondents using a structured questionnaire and convenience sampling. Percentage and weighted average were used for analysis. Mann–Whitney U and Kruskal–Wallis tests were used to examine group differences. Spearman’s rank correlation was used to study relationships between the variables.

5. ANALYSIS AND DISCUSSION

Table 1: Profile of Respondents

Variable	Category	Number	Percentage
Gender	Male	34	56.67
	Female	26	43.33

Age	Below 20 years	5	8.33
	20-30 years	19	31.67
	31-40 years	18	30.00
	41-50 years	11	18.33
	Above 50 years	7	11.67
Educational Qualification	Higher Secondary	7	11.67
	Diploma	5	8.33
	Undergraduate	19	31.67
	Postgraduate	19	31.67
	M.Phil./Ph.D.	6	10.00
Occupation	Other	4	6.67
	Student	9	15.00
	Government Employee	10	16.67
	Private Employee	15	25.00
	Business/Self-employed	9	15.00
	Professional	6	10.00
	Homemaker	6	10.00
	Retired	3	5.00
Monthly Income	Other	2	3.33
	No income	5	8.33
	Below ₹20,000	9	15.00
	₹20,001-₹40,000	17	28.33
	₹40,001-₹60,000	13	21.67
	₹60,001-₹80,000	9	15.00
Type of Bank Account	Above ₹80,000	7	11.67
	Savings Account	41	68.33
	Current Account	6	10.00
	Salary Account	10	16.67
Type of Bank	Other	3	5.00
	Public Sector Bank	24	40.00
	Private Sector Bank	24	40.00
	Cooperative Bank	7	11.67
	Small Finance Bank	3	5.00
Duration of Banking Relationship	Other	2	3.33
	Less than 1 year	5	8.33
	1-3 years	15	25.00
	4-6 years	17	28.33
	7-10 years	12	20.00
	More than 10 years	11	18.33
Total		60	100.00

The sample consisted of 56.67% males and 43.33% females. In terms of age, 8.33% were below 20 years, 31.67% were 20-30 years, 30% were 31-40 years, 18.33% were 41-50 years, and 11.67% were above 50 years. 11.67% had Higher Secondary educational qualification, 8.33% had a Diploma, 31.67% were Undergraduates, 31.67% were Postgraduates, 10% had M.Phil./Ph.D., and 6.67% had other qualifications. 15% were students, 16.67% were government employees, 25% were private employees, 15% were business/self-employed, 10% were professionals, 10% were homemakers, 5% were retired, and 3.33% belonged to other occupations. 8.33% had no

monthly income, 15% earned below 20,000, 28.33% earned 20,001-40,000, 21.67% earned 40,001-60,000, 15% earned 60,001 -80,000, and 11.67% earned above 80,000. With regard to bank accounts, 68.33% had savings accounts, 10% had current accounts, 16.67% had salary accounts, and 5% had other accounts. Among the respondents, 40% used public sector banks, 40% used private sector banks, 11.67% used cooperative banks, 5% used small finance banks, and 3.33% used other banks. 8.33% had less than one year, 25% had 1-3 years, 28.33% had 4-6 years, 20% had 7-10 years, and 18.33% had more than 10 years relationship with the bank.

Table 2: Awareness about Green Banking

Awareness Item	Agree	Neutral	Disagree	Weighted Score	Weighted Average
Awareness of paperless banking	28	15	17	131	2.183
Awareness of internet banking	38	12	10	148	2.467
Awareness of mobile banking	34	14	12	142	2.367
Awareness of e-statements	21	18	21	120	2.000
Awareness of electronic fund transfers	33	15	12	141	2.350
Awareness of cashless banking	29	19	12	137	2.283
Awareness of digital payments	38	11	11	147	2.450
Awareness of green financing	16	19	25	111	1.850

Awareness of environmental benefits	31	12	17	134	2.233
Overall Average					2.243

Awareness of internet banking was the highest (2.467), followed by digital payments (2.450) and mobile banking (2.367). Awareness of electronic fund transfers (2.350), cashless banking (2.283), environmental benefits (2.233), and paperless banking (2.183) was also moderate. Awareness of e-statements (2.000) was comparatively low, while green

financing recorded the lowest mean score (1.850). the overall awareness of green banking and digital banking services was moderate, with an overall mean score of 2.243.

Gender and Awareness on Green Banking

H₀1: There is no significant difference in awareness between male and female respondents.

Table 3: Gender and Awareness on Green Banking (Mann–Whitney U test)

Variable	U	p-value	Result
Gender and Awareness	302.500	0.0375	Significant

The results indicate that awareness levels differ significantly between male and female respondents ($U = 302.500$, $p = 0.0375$). As the p-value is below 0.05, the difference is statistically significant. Hence, gender influences the level of awareness among the respondents.

Educational Qualification and Awareness on Green Banking

H₀2: There is no significant difference in awareness based on the educational level of respondents.

Table 4: Educational Qualification and Awareness on Green Banking (Kruskal–Walli's test)

Variable	H	p-value	Result
Educational Qualification and Awareness	3.155	0.676	Not Significant

Awareness levels do not vary significantly among the respondents with different educational qualifications ($H = 3.155$,

$df = 5$, $p = 0.676$). Since the p-value of 0.676 exceeds the 0.05 significance level, the null hypothesis is accepted.

Table 5: Source of Awareness

Source	Number	Percentage
Bank employees	18	30.00
Bank websites/mobile applications	21	35.00
Social media	18	30.00
Television/radio	13	21.67
Newspapers/magazines	15	25.00
Friends and relatives	19	31.67
Educational institutions	17	28.33
Financial advisors	10	16.67
Advertisements	15	25.00
Government campaigns	19	31.67
Internet/search engines	16	26.67

The main source of awareness was bank websites/mobile applications (35.00%), followed by friends and relatives and government campaigns (31.67% each), Bank employees and social media (30% each), educational institutions (28.33%),

Internet/search engines (26.67%) and newspapers/magazines and advertisements (25.00% each). Television/radio accounted for 21.67%, and financial advisors (16.67%). Multiple responses were received, so the total percentage exceeds 100%.

Table 6: Use of Green Banking Services

Green Banking Service	Number	Percentage
Internet banking	20	33.33
Mobile banking	13	21.67
UPI/Digital payments	20	33.33
Electronic fund transfer	18	30.00
E-statements	19	31.67
SMS/E-mail banking alerts	19	31.67
ATM services	11	18.33
Online bill payment	17	28.33
Online cheque/payment services	18	30.00

Card-based transactions	17	28.33
Cashless banking	16	26.67
Green/Eco-friendly loans	24	40.00

Green/eco-friendly loans were the most used green banking service (40%), followed by internet banking and UPI/digital payments (33.33% each), E-statements and SMS/e-mail

banking alerts (31.67% each), Electronic fund transfer and online cheque/payment services (30% each). ATM services had the lowest usage (18.33%).

Table 7: Frequency of Usage

Frequency of Usage	Number	Percentage
Daily	13	21.67
Several times a week	11	18.33
Once a week	15	25.00
Several times a month	16	26.67
Rarely	3	5.00
Never	2	3.33
Total	60	100.00

Most respondents used green banking services several times a month (26.67%), followed by once a week (25.00%) and daily

(21.67%). Another 18.33% used them several times a week. Only 5.00% used them rarely, while 3.33% never used them.

Table 8: Duration of Using Green Banking Services

Duration	Number	Percentage
Less than 1 year	1	1.67
1-2 years	16	26.67
3-5 years	21	35.00
6-10 years	14	23.33
More than 10 years	8	13.33
Total	60	100.00

Most respondents using green banking services for 3-5 years (35%), followed by 1-2 years (26.67%) and 6-10 years

(23.33%). 13.33% are using them for more than 10 years, and only 1.67% are using them for less than one year.

Table 9: Reasons for using

Reasons	Agree	Neutral	Disagree	Weighted Score	Weighted Average
Saves time	38	9	13	145	2.417
Reduces the need to visit bank branches	32	16	12	140	2.333
Convenient to use	41	14	5	156	2.600
Provides easy access to banking services	42	6	12	150	2.500
Reduces paper consumption	38	16	6	152	2.533
Reduces environmental pollution	32	13	15	137	2.283
Helps reduce banking costs	26	17	17	129	2.150
Enables quick completion of transactions	40	13	7	153	2.550
Available 24 hours a day	45	6	9	156	2.600
Environmentally friendly	35	11	14	141	2.350
Overall Average					2.432

The highest mean value is for convenience and 24-hour availability (2.600 each), followed by quick completion of transactions (2.550), reduced paper consumption (2.533), Easy access to banking services (2.500), and reducing environmental pollution (2.283). The lowest mean was for reducing banking costs (2.150), Thus, the respondents have a positive perception

of green banking services, with overall weighted average of 2.432.

Awareness and Usage of Green Banking Services

H₀₃: There is no significant relationship between awareness and usage of green banking services.

Table 10: Relationship with Awareness and Usage of Green Banking Services (Spearman's rank correlation)

Variable	Spearman's ρ	p-value	Result
Awareness $\times$ Usage	0.431	<0.001	Significant Positive

There is a moderate significant positive relationship between awareness and usage of green banking services ($\rho = 0.431$, $p <$

0.001). Thus, respondents who are more aware of green banking services are more likely to use them.

Table 11: Satisfaction with Green Banking Services

Satisfaction Factors	High	Medium	Low	Weighted Score	Weighted Average
Convenience of green banking services	43	6	11	152	2.533
Speed of green banking transactions	39	10	11	148	2.467
Accessibility of green banking services	38	10	12	146	2.433
Reliability of green banking services	37	10	13	144	2.400
Security of green banking services	30	13	17	133	2.217
Ease of using green banking services	34	12	14	140	2.333
Availability of green banking services	35	10	15	140	2.333
Quality of green banking facilities	29	16	15	134	2.233
Reduction in paperwork	38	9	13	145	2.417
Environmental benefits of green banking	34	13	13	141	2.350
Overall Satisfaction					2.372

Convenience of green banking services had the highest satisfaction (WA=2.533), followed by speed of transactions (WA=2.467), accessibility (WA=2.433), reliability (WA=2.400), reduction in paperwork (WA=2.417), and environmental benefits (WA =2.350). Security had lowest weighted average of 2.217, indicating comparatively lower

satisfaction. Overall, the respondents are generally satisfied with green banking services (Overall WA=2.372).

Gender and Satisfaction with Green Banking Services

H₀₄: There is no significant difference in satisfaction with green banking services between male and female respondents.

Table 12: Gender and Satisfaction with Green Banking Services (Mann–Whitney U test)

Variable	U	p-value	Result
Gender and Satisfaction	432.500	0.892	Not Significant

The mean satisfaction values were 2.391 for males and 2.346 for females and the satisfaction levels do not differ significantly between male and female respondents (U = 432.500, p = 0.892). Therefore, the null hypothesis is accepted.

Type of Bank and Satisfaction with Green Banking Services

H₀₅: There is no significant difference in satisfaction with green banking services based on the type of bank.

Table 13: Type of Bank and Satisfaction with Green Banking Services (Kruskal–Walli's test)

Hypothesis	H	p-value	Result
Type of Bank and Satisfaction	14.307	0.006	Significant

There is a significant difference in satisfaction based on the type of bank (H = 14.307, p = 0.006). Since the p-value is less than 0.05, the null hypothesis is rejected. Hence, the type of bank has a significant influence on the satisfaction level of respondents with green banking services.

Relationship between Usage and Satisfaction with Green Banking Services

H₀₆: There is no significant relationship between usage and satisfaction with green banking services.

Table 14: Relationship between Usage and Satisfaction with Green Banking Services (Spearman's rank correlation)

Variable	Spearman's ρ	p-value	Result
Usage $\times$ Satisfaction	0.330	0.010	Significant Positive

There is a significant positive relationship between usage and satisfaction with green banking services ($\rho = 0.330$, p = 0.010).

This suggests that increased usage of green banking services results in higher satisfaction among respondents.

Table 15: Difficulties Experienced in Green Banking Practices

Difficulties	High	Medium	Low	Weighted Score	Weighted Average
Poor internet connectivity	19	22	19	120	2.000
Security/Data privacy concerns	21	18	21	120	2.000
Lack of awareness	19	11	30	109	1.817
Lack of digital skills	13	15	32	101	1.683
Technical problems	14	20	26	108	1.800
Transaction failure or delay	19	26	15	124	2.067
Lack of customer support	12	23	25	107	1.783
Difficulty understanding services	11	19	30	101	1.683
Fear of making mistakes	10	20	30	100	1.667
Difficulty in complaint resolution	8	21	31	97	1.617

Lack of personal assistance	14	20	26	108	1.800
Overall Difficulties					1.811

The transaction failure or delay was the most prominent difficulty (WA=2.067) followed by Poor internet connectivity and security/data privacy concerns (WA= 2.000 each), Technical problems and lack of personal assistance (WA= 1.800 each). Difficulty in complaint resolution was the least problem (WA=1.617). The overall weighted average was

1.811, indicating that respondents have difficulties at a moderate level.

Gender and Difficulties Faced

H₀₇: There is no significant difference in the difficulties faced by male and female respondents in using green banking services.

Table 16: Gender and Difficulties faced (Mann–Whitney U test)

Variable	U	p-value	Result
Gender and Difficulties	321.500	0.073	Not Significant

There is no significant difference in difficulties faced by male and female respondents (U = 321.500, p = 0.073). The mean difficulty score was 1.695 for males and 1.962 for females. Since the p-value is greater than 0.05, the difference is not statistically significant. Therefore, the null hypothesis is accepted.

Type of Bank and Difficulties faced

H₀₈: There is no significant difference in the challenges faced by respondents based on the type of bank.

Table 17: Type of Bank and Difficulties Faced (Kruskal–Wallis H)

Variables	H	p-value	Result
Type of Bank and Challenges	9.521	0.049	Significant

There is a significant difference in the challenges faced based on the type of bank (H = 9.521, p = 0.049). Since the p-value is less than 0.05, the difference is statistically significant. Therefore, the challenges faced by respondents vary significantly according to the type of bank.

Relationship between Difficulties Faced and Satisfaction with Green Banking Services

H₀₉: There is no significant relationship between difficulties faced and satisfaction with green banking services.

Table 18: Relationship between Difficulties Faced and Satisfaction with Green Banking Services (Spearman's rank correlation)

Variable	Spearman's ρ	p-value	Result
Challenges $\times$ Satisfaction	-0.155	0.038	Significant negative

There is a significant negative relationship between challenges and satisfaction ($\rho = -0.155$, p = 0.038). This means that as the difficulties faced by respondents increase, their satisfaction with green banking services tends to decrease.

6. FINDINGS

- The sample consisted of 56.67% males and 43.33% females. The largest age group was 20-30 years (31.67%), followed by 31-40 years (30.00%).
- Undergraduates and postgraduates were the largest educational groups (31.67% each). Private employees formed the largest occupational group (25.00%).
- The highest income group was 20,001-40,000 (28.33%). Savings accounts were the most common type of bank account (68.33%).
- Public sector and private sector banks were equally used by respondents (40.00% each). Majority of the respondents had a banking relationship of 4-6 years (28.33%).
- Awareness of internet banking was the highest (WA = 2.467), followed by digital payments (WA=2.450) and mobile banking (WA=2.367). Green financing had the

lowest awareness (WA=1.850). The overall awareness mean was 2.243, indicating a moderate level of awareness.

- Awareness did not differ significantly based on educational qualification (H = 3.155, p = 0.676).
- Bank websites/mobile applications were the main source of awareness (35.00%), followed by friends and relatives and government campaigns (31.67% each).
- Green/eco-friendly loans were the most used green banking service (40%), followed by internet banking and UPI/digital payments (33.33% each). ATM services had the lowest usage (18.33%).
- Most respondents used green banking services several times a month (26.67%), followed by once a week (25.00%) and daily (21.67%).
- Majority of the respondents are using green banking services for 3-5 years (35%), followed by 1-2 years (26.67%).
- Convenience and 24-hour availability received the highest mean (WA=2.600 each). Reducing banking costs had the lowest mean (WA=2.150). The overall weighted average

was 2.432, showing a positive perception of green banking services.

- Awareness and usage had a moderate and significant positive relationship ($p = 0.431$, $p < 0.001$). This shows that higher awareness results in higher usage.
- Convenience had the highest satisfaction ($WA = 2.533$), followed by speed of transactions ($WA=2.467$). Security had the lowest score ($WA=2.217$). The overall satisfaction weighted average was 2.372.
- Satisfaction did not differ significantly between males and females ($U = 432.500$, $p = 0.892$).
- Satisfaction differed significantly according to the type of bank ($H = 14.307$, $p = 0.006$).
- Usage and satisfaction had a significant positive relationship ($p = 0.330$, $p = 0.010$). Higher usage leads to higher satisfaction.
- Transaction failure or delay was the major difficulty ($WA = 2.067$), followed by poor internet connectivity and security/data privacy concerns ($WA = 2.000$ each). Complaint resolution was the least reported difficulty ($WA = 1.617$). The overall weighted average of difficulties was 1.811, indicating a moderate level of difficulties faced by respondents.
- Difficulties did not differ significantly between males and females ($U = 321.500$, $p = 0.073$).
- Challenges differed significantly based on the type of bank ($H = 9.521$, $p = 0.049$).
- Challenges and satisfaction had a significant negative relationship ($p = -0.155$, $p = 0.038$). This means that as the difficulties faced by respondents increase, their satisfaction with green banking services tends to decrease.

Suggestions

- Banks should conduct more awareness programmes on green banking services.
- Banks should promote UPI and other digital payment services.
- More customers should be encouraged to use e-statements instead of paper statements.
- Security and data privacy of online banking services should be strengthened.
- Banks should promote the environmental benefits of paperless and digital banking.
- Banks should regularly collect customer feedback to improve green banking services.

7. CONCLUSION

The customers in Kannur district have a moderate level of awareness about green banking services. Digital banking services such as internet banking, UPI, and mobile banking are commonly used by respondents. Customers are generally satisfied with green banking services, especially because they are convenient, fast, and available throughout the day. However, problems such as transaction delays, poor internet connectivity, and security concerns are still experienced by some respondents. The study also found a significant positive

relationship between awareness and usage of green banking services and between usage and satisfaction with green banking services. Further, the difficulties faced in the usage of green banking services results lower satisfaction. Therefore, banks should improve digital facilities, strengthen security, increase customer awareness, and provide better support to encourage wider use of green banking services.

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