

# Green Finance: Reduce, Reuse & Recycle Strategy for the Environment

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**K.H. Akhila**

Research Scholar, Department of Commerce, Alagappa University, Tamil Nadu, India

 <https://orcid.org/0000-0002-2884-3785>

**G. Nedumaran**

Professor, Department of Commerce, Alagappa University, Karaikudi, Tamil Nadu, India

## Abstract

Green finance has emerged as a pivotal strategy in addressing environmental challenges and promoting sustainability in the banking sector. This study explores the role of green financial forecasting with a focus on the ‘Reduce, Reuse, and Recycle’ (RRR) strategy, specifically emphasizing the Reduce component. Utilizing a correlation matrix and regression analysis, the research examines the relationship between green banking initiatives and key variables like the use of ATMs and checking balances, to assess the impact of reducing environmental footprints on financial outcomes. Findings reveal a strong positive correlation between green banking practices and financial sustainability, highlighting the importance of integrating eco-friendly strategies within banking operations. Additionally, the study introduces the FAIR Model—a comprehensive framework for implementing sustainable banking practices—demonstrating its applicability in fostering green banking in India. The paper also outlines avenues for further development of green banks in India, emphasizing the need for innovation in infrastructure, energy efficiency, and the role of green financial products. The insights drawn from this research provide valuable guidance for policymakers, financial institutions, and investors aiming to align financial strategies with environmental sustainability.

**Keywords:** Green Finance, Green Banking, Sustainability, RRR Strategy, FAIR Model, Financial Forecasting, Indian Banks

The growing global concern over climate change and environmental degradation has prompted industries to rethink their practices, and the financial sector is no exception. As one of the key drivers of economic growth, the banking sector plays a crucial role in directing investments toward sustainable development. In this context, green finance - which focuses on environmentally friendly and sustainable financial practices - has gained prominence. Green finance aims to align financial outcomes with environmental objectives, ensuring that economic growth is achieved without compromising ecological well-being.

Green banking, a subset of green finance, involves the adoption of banking practices that prioritize environmental sustainability. This includes financing projects related to renewable energy, energy efficiency, and sustainable agriculture, as well as implementing internal eco-friendly operations. The banking industry, traditionally considered environmentally benign due to its low direct environmental impact, is now recognizing its broader role in influencing the environmental practices of its clients. Green banking initiatives, therefore, focus not only on reducing the sector’s carbon footprint but also on fostering sustainable business models among its customers.

In this study, we examine the Reduce, Reuse, Recycle (RRR) strategy within the framework of green financial forecasting. Specifically, this research focuses on the ‘Reduce’ aspect, which involves minimizing resource

consumption and waste in banking operations. By utilizing statistical tools such as a correlation matrix and regression analysis, this paper aims to explore the relationship between green banking initiatives-such as the use of ATMs and online banking-and financial sustainability. Additionally, the study introduces the FAIR Model, a comprehensive framework for implementing green banking practices, and discusses its potential in fostering sustainable banking in India.

### Research Objectives

- To evaluate the applicability of the FAIR Model in promoting green banking in India.
- To analyze the impact of green banking initiatives on financial sustainability using the RRR strategy.
- To explore the potential avenues for establishing green banks and promoting eco-friendly financial products in India.

This research not only contributes to the growing body of literature on green finance but also offers practical insights for policymakers, banking institutions, and investors looking to incorporate sustainable practices into their financial strategies.

### Literature Review

The concept of green banking has gained significant attention in recent years as financial institutions seek to align their practices with the goals of environmental sustainability. Numerous studies have explored the role of banks in promoting sustainable development by integrating environmentally conscious practices into their operations and investment strategies. This review of literature highlights the key contributions of green banking to sustainable finance and examines various models and approaches employed by banks to reduce their environmental impact.

(Vafeeque) conducted an empirical study on public sector banks, focusing on green banking initiatives aimed at reducing carbon footprints. The study identified practices such as paperless banking, energy-conscious operations, and socially responsible services as critical components of green banking. These efforts were largely centered on reducing carbon emissions by constructing green buildings and adopting energy-efficient technologies.

(Meena) further emphasized that while banks are not typically viewed as polluting industries, their large-scale operations have contributed to increased carbon footprints, largely due to energy consumption, excessive paper usage, and waste from IT devices. Both studies underscore the importance of banks adopting green innovations and processes to significantly reduce their external carbon output.

Several studies have examined customer awareness and the adoption of green banking practices. (Praveen and Harina) found that while customers in Kerala are aware of green banking services, such as online banking and ATMs, there is insufficient knowledge about the full range of eco-friendly services available. Similarly, (Malliga and Revathy) noted that customers benefit from convenient, fast transactions through green banking, but banks need to enhance awareness and accessibility to promote wider adoption. According to (Kumar and Prakash), the rise of digital banking technologies such as mobile and internet banking offers a significant opportunity for banks to reduce their operational carbon footprints while improving customer satisfaction and operational efficiency.

The role of banks in achieving sustainable development goals (SDGs) has been highlighted in various studies. (Kumar and Prakash) emphasized that sustainable banking models should not only focus on financial performance but also on addressing social and environmental issues. (Jeucken and Bouma) explored how banks can support sustainable business practices by offering financial products that prioritize environmentally friendly investments, such as renewable energy and energy-efficient technologies. The authors argued that banks play a critical role in advancing green finance by promoting responsible lending practices and funding projects that reduce environmental harm.

(Francis) introduced the FAIR Model as a comprehensive approach to green banking, focusing on four key components: Financing environmentally friendly practices, Awareness and training programs, Innovation in infrastructure, and Reduce, Reuse, Recycle (RRR). This model provides a structured framework for banks to implement sustainable practices and monitor their environmental impact. The RRR strategy, particularly the 'Reduce'

component, has been identified as crucial for minimizing resource consumption and waste within the banking sector. (Chaurasia) has demonstrated that implementing this model can lead to significant reductions in energy use and emissions in bank operations.

In the Indian context, several studies have highlighted the progress and challenges of adopting green banking practices. (Chaurasia) examined the green banking practices of Indian banks, noting that early efforts focused on offering low-interest loans for environmentally conscious investments, such as renewable energy projects and green buildings. (Narang) highlighted the competitive pressures driving Indian banks to adopt green technologies and reduce their environmental footprints. The establishment of green banks and the issuance of green bonds by institutions such as Yes Bank and State Bank of India have marked significant milestones in India's transition towards sustainable finance.

While substantial progress has been made in promoting green banking, several research gaps remain. There is limited longitudinal data on the long-term effects of green banking initiatives on financial performance and environmental sustainability. Additionally, studies exploring the full integration of the Reuse and Recycle components of the RRR strategy in green banking are sparse. Furthermore, there is a need for more comprehensive models that examine the specific challenges and opportunities of establishing green banks in developing economies like India.

## Methodology

This study adopts a straightforward approach, using both data analysis and a review of existing literature to examine how green banking practices impact sustainability in India. Specifically, it focuses on the Reduce, Reuse, Recycle (RRR) strategy, with an emphasis on the 'Reduce' component in financial operations.

## Research Design

The study is exploratory, aiming to analyze the relationship between green banking initiatives and their effect on sustainability. It also evaluates the

FAIR Model, a framework for implementing green banking practices, to see how it helps in reducing the environmental impact of banking.

## Data Collection

The research is based on secondary data gathered from the annual reports and sustainability reports of Indian banks. Government publications, especially from the Reserve Bank of India (RBI) and the Department for Promotion of Industry and Internal Trade (DPIIT). Previous studies and research papers on green banking.

## Variables Studied

The key variables examined include:

- Green Banking Initiatives: Use of ATMs, online banking, and e-statements.
- RRR Strategy (Reduce): Efforts to reduce resource use, such as energy and paper.
- Financial Sustainability: Savings, efficiency, and financial performance resulting from green banking.

## Data Analysis Techniques

- Correlation Matrix: Used to see how green banking practices (e.g., ATM usage, checking balances) relate to sustainability.
- Regression Analysis: Assessed the impact of green banking initiatives on overall financial outcomes.
- FAIR Model Evaluation: Looked at how banks implement the Reduce component to minimize their environmental footprint.

## Study Sample

The study focuses on Indian banks like Yes Bank, State Bank of India (SBI), Punjab National Bank (PNB), and ICICI Bank, examining their green banking initiatives.

## Results and Discussion

Banks are increasingly recognizing the need to adopt formal green banking policies to prevent environmental damage and support sustainable practices. To facilitate this, the 'FAIR to Earth' model has been developed. This model offers a comprehensive approach that helps banks implement

green banking practices across their operations, contributing to sustainable development.

The FAIR Model was chosen for its comprehensive approach to integrating environmental practices into banking. Unlike other models that may only focus on specific aspects, the FAIR Model provides a holistic framework. It includes Formulating green policies, Assessing environmental impact, Implementing sustainable practices, and Reviewing and improving these strategies. By adopting this model, banks can ensure their operations are more environmentally responsible and aligned with international standards, making it an ideal choice for promoting green banking.

**Key Components of the FAIR Model**

**Funding Eco-Friendly Projects:** Banks can promote green finance by offering loans for eco-friendly products and projects, such as solar energy systems or fuel-efficient vehicles. For example, State Bank of India (SBI) offers special loans for green buildings with interest concessions. Other green banking initiatives include supporting renewable energy projects and providing green auto loans. Additionally, brownfield financing is available for redeveloping contaminated land, helping to reduce the pressure on green spaces.

**Awareness and Training Programs:** Banks can play a critical role in educating both staff and customers about green banking practices. Training programs can raise awareness about eco-friendly financial products, carbon credit trading, and green financing initiatives, empowering stakeholders to make more sustainable choices.

**Innovation in Infrastructure:** One of the most important steps in green banking is adopting eco-friendly infrastructure. Banks can move toward paperless banking, create energy-efficient buildings, and reduce energy consumption by using renewable energy like solar power. For example, switching from traditional bulbs to energy-saving CFL or LED bulbs and using modern office equipment that consumes less power can significantly reduce the environmental footprint of banks.

**Reuse and Recycle Strategies in Banking:** Banks can adopt a reduce, reuse, recycle strategy to minimize resource consumption. This includes

reducing paper usage through online services like e-statements, mobile banking, and online bill payments. Promoting digital transactions and reducing the reliance on paper-based banking can help reduce costs and energy consumption. For example, ATMs, Point-of-Sale (POS) machines, and online funds transfers are all sustainable alternatives to traditional banking.

**Leading Green Initiatives by Several Indian Banks**

- YES Bank launched green infrastructure bonds to fund renewable energy projects.
- State Bank of India (SBI) started a wind farm project and implemented paperless banking systems.
- Punjab National Bank (PNB) conducted energy audits and introduced green credit cards to promote sustainability.
- ICICI Bank promotes online banking to reduce carbon footprints and offers green auto loans with reduced processing fees for eco-friendly vehicles.
- State Bank of Mysore has adopted energy-efficient practices, including banning plastic and using eco-friendly building policies.

In this study, the analysis focuses on the FAIR Model, where F stands for financing eco-friendly projects, A represents awareness and training programs, I emphasizes innovation in infrastructure, and R stands for the reduce, reuse, and recycle strategy. The study draws on the work of Francis and uses the Pearson Correlation Coefficient and a Correlation Matrix to examine the relationships between these key variables. The following section provides a brief explanation of each variable.

**Table 1**

Reduce	Reuse	Recycle
E-Account Statement	Decorating	Sorting of Papers
Balance Enquiry	Cleaning Surface	Used Receipt
Online Payment of Bills	Wrapping Usage	Used Cheque
Reuse of Cheque	Usage of one side Paper	Paper Cups
E-Tax Payment	Receipt Reuse	Paper Plate

E- Ticketing	Donation of Paper	Reuse Printed paper
Online Application of IPO	Building DBA (Digital Banking Architecture)	Reusing Intention by employees
Use of ATM & POS	E-Waste Collection	Promotion of Recycling

The researcher identified key factors from the variables mentioned above, with the RRR (Reduce, Reuse, Recycle) strategy being the most closely linked to the FAIR model. Among these, the REDUCE component was found to be the most important. To understand the relationship between the variables, the researcher used a correlation matrix in the analysis.

**Table 2 Correlation Matrix of Digital Banking Services and Financial Transactions**

	EAS	CB	BOP	RC	ETP	ET	OAIPO	UATM	UPOS	UNEFT
EAS	1									
CB	-0.37782	1								
BOP	-0.05357	0.205641	1							
RC	0.07617	-0.06381	0.438349	1						
ETP	0.626384	-0.23714	0.182403	0.209584	1					
ET	-0.22455	0.458582	-0.38992	-0.56328	-0.26627	1				
OAIPO	-0.19264	-0.04902	-0.19275	0.088476	0.038067	0.049504	1			
UATM	0.114044	-0.25237	-0.02755	-0.06712	0.054082	-0.19394	0.033963	1		
UPOS	0.012286	-0.10855	0.342038	-0.34847	-0.08156	-0.06052	-0.22938	0.097197	1	
UNEFT	-0.11579	-0.03346	0.270282	0.114592	-0.12658	-0.22294	0.021783	0.281998	0.161795	1

**Source:** Author compiled

**Note:** EAS - E - A/C Statement, CB - Checking Balances, BOP - Online Bill Payments, RC - Reuse of Cheque, ETP - E Tax Payment, ET - E-Ticketing, OAIPO - Online Application for IPO, UATM - Use of ATM, UPOS - Use of POS, UNEFT - Use of NEFT

Table 2 The correlation matrix provides insights into the relationships between various variables related to green banking initiatives. The values range from -1 to 1, where positive values indicate a positive relationship, and negative values indicate an inverse relationship. Here’s a breakdown of key correlations, E-Account Statement (EAS) shows a moderate positive correlation with E-Tax Payment (ETP) (0.626384), indicating that users who opt for e-account statements are more likely to use e-tax payment services, suggesting a strong inclination toward paperless and digital banking. On the other hand, EAS has a negative correlation with Checking Balances (CB) (-0.37782) and E-Ticketing (ET) (-0.22455). This implies that users who prefer e-account statements are less likely to frequently check balances or use e-ticketing services, indicating different preferences in digital banking behavior.

Checking Balances (CB) shows a moderate positive correlation with E-Ticketing (ET) (0.458582), meaning that users who frequently check their account balances are also more likely to

use e-ticketing services. However, CB has a negative correlation with E-Tax Payment (ETP) (-0.23714) and E-Account Statement (EAS) (-0.37782). This indicates that those who check balances often may be less inclined to adopt other digital services like e-tax payment or e-account statements, possibly reflecting a preference for traditional banking services.

Online Bill Payments (BOP) has a positive correlation with Reuse of Cheques (RC) (0.438349), suggesting that users who prefer paying bills online are more likely to reuse cheques, indicating an overlap between online banking behaviors and eco-conscious practices like cheque reuse. However, BOP shows relatively weak correlations with other variables such as Checking Balances (CB) and E-Account Statement (EAS), indicating minimal connections between these services and online bill payments.

Reuse of Cheques (RC) shows a negative correlation with E-Ticketing (ET) (-0.56328), indicating that users who reuse cheques are less likely to use e-ticketing services. This suggests a divide

between traditional cheque users and those who engage in modern digital transactions like e-ticketing. RC also has a positive correlation with Online Bill Payments (BOP) (0.438349), highlighting that users focused on eco-friendly practices like cheque reuse are also likely to engage in online bill payments.

E-Tax Payment (ETP) shows a strong positive correlation with E-Account Statements (EAS) (0.626384), suggesting that individuals who opt for e-tax payments are highly likely to also receive e-account statements. This connection underscores a pattern of users embracing multiple digital services. On the other hand, ETP has a negative correlation with E-Ticketing (ET) (-0.26627), implying that users of e-tax payments are less likely to engage in e-ticketing services.

E-Ticketing (ET) has moderate to strong negative correlations with multiple variables, including Reuse of Cheques (RC) (-0.56328) and E-Account Statements (EAS) (-0.22455). This suggests that users who frequently use e-ticketing services are less likely to engage in traditional banking practices such as cheque reuse or even opt for e-account statements. This could reflect a preference for more modern, convenient services among e-ticketing users.

Use of ATMs (UATM) shows a weak positive correlation with E-Account Statement (EAS) (0.114044), indicating a slight tendency for those who use ATMs to also receive e-statements. However, its correlation with other variables like Checking Balances (CB) and Online Application for IPO (OAIPO) is minimal, suggesting that ATM users may not engage as actively in other digital or paperless banking services.

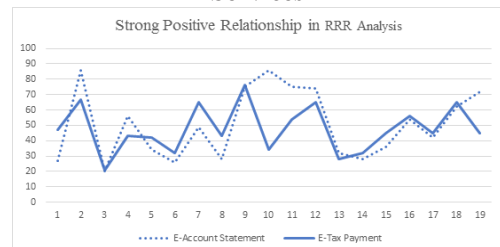
Use of POS (UPOS) shows a positive correlation with Online Bill Payments (BOP) (0.342038), indicating that individuals who use POS systems are more likely to make online bill payments. However, UPOS has a negative correlation with Reuse of Cheques (RC) (-0.34847), suggesting that POS users may not prioritize traditional cheque-based transactions, favoring digital payment methods instead.

Use of NEFT (UNEFT) has a positive correlation with Use of ATMs (UATM) (0.281998), suggesting that users who rely on NEFT for electronic funds transfers are more likely to also use ATMs.

Additionally, UNEFT shows a positive correlation with Online Bill Payments (BOP) (0.270282), highlighting that those who use NEFT are also inclined to pay bills online, further supporting a preference for digital banking services.

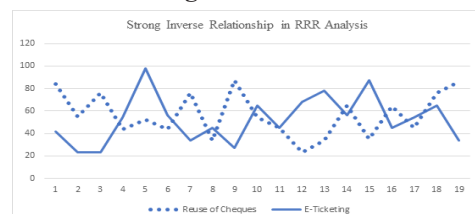
The correlation analysis highlights key relationships between green banking services. E-Account Statements (EAS) and E-Tax Payments (ETP) exhibit a strong positive relationship, suggesting these services are closely linked in promoting paperless transactions. On the other hand, services like E-Ticketing (ET) and Reuse of Cheques (RC) show a strong inverse relationship, indicating differing user behaviors in traditional versus digital services. These insights help identify patterns in customer preferences and areas where banks can focus to enhance the adoption of eco-friendly banking practices.

**Chart 1 Strong Positive Relationship of Digital Services**



The above chart 1 exhibits the relationships between green banking services. E-Account Statements (EAS) and E-Tax Payments (ETP) exhibit a strong positive relationship, suggesting these services are closely linked in promoting paperless transactions.

**Chart 2 Strong Inverse Relationship of Digital Services**



The above chart 2 exhibits the relationships between green banking services like E-Ticketing (ET) and Reuse of Cheques (RC) show a strong inverse relationship, indicating differing user behaviors in traditional versus digital services.

Regression analysis is a statistical method used to study the relationship between independent variables and a dependent variable. In this case, researchers are examining how ATM usage and checking balances influence the dependent variable, Usage of Green Banking Initiatives. The goal is to understand how changes in ATM usage and checking balances impact the adoption of green banking practices. This approach helps assess the importance of these factors and their combined effect on green banking participation, providing insights into what drives people to engage with green banking initiatives.

**Table 3 Regression Analysis of the Impact of ATM Usage on Checking Balances**

Dependent Variable: Checking_Balances				
Method: Least Squares				
Date: 09/19/24 Time: 02:51				
Sample: 1 19				
Included observations: 19				
Variable	Coefficient	Std. Error	t-statistic	Prob.
C	65.7795	15.1393	4.3449	0.0004
Use of ATM	-0.2817	0.2620	-1.0753	0.2972
R-squared	0.0637	Mean dependent var		50.6842
Adjusted R-squared	0.0086	S.D. dependent var		24.8195
S.E. of regression	24.7124	Akaike info criterion		9.3518
Sum squared resid	10381.9200	Schwarz criterion		9.4512
Log likelihood	-86.8420	Hannan-Quinn criter.		9.3686
F-statistic	1.1564	Durbin-Watson stat		1.2866
Prob (F-statistic)	0.2972			

The regression analysis explores the relationship between Use of ATM and Checking Balances. The coefficient for Use of ATM is -0.2817, indicating a slight negative association, suggesting that as ATM usage increases, the frequency of checking balances

decreases. However, with a p-value of 0.2972, this relationship is not statistically significant. The model's R-squared value of 0.0637 shows that only 6.37% of the variation in Checking Balances is explained by ATM usage, highlighting its limited explanatory power. Additionally, the F-statistic of 1.1564 ( $p = 0.2972$ ) suggests that the overall model is not significant. In conclusion, ATM usage does not significantly affect the frequency of Checking Balances, and other factors may have a more substantial influence.

### Conclusion

This study provides a detailed look at green banking initiatives through the Reduce, Reuse, Recycle (RRR) strategy and the FAIR Model. It shows how banks are adopting eco-friendly practices to promote environmental sustainability while maintaining financial growth. Green banking actions like reducing paper use, improving energy efficiency, and funding renewable energy projects help reduce the banking sector's environmental impact. The correlation analysis revealed important links between digital banking services and green banking initiatives, suggesting ways for banks to encourage more widespread use of these services. The regression analysis found that ATM usage has little impact on how often people engage in green banking initiatives, as the model had low explanatory power. This indicates that while green banking services are expanding, other factors-like customer awareness, infrastructure improvements, and policy support-might have a greater influence on the adoption of sustainable banking practices. In conclusion, the FAIR Model provides a strong framework for integrating sustainability into banking. By focusing on eco-friendly financing, raising awareness, improving infrastructure, and applying the RRR strategy, banks can significantly contribute to both environmental sustainability and financial stability. These insights can guide policymakers, banks, and investors in promoting green banking practices in India and beyond.

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**Annexure**

S. No	EAS	CB	BOP	RC	ETP	ET	OAIPO	UATM	UPOS	UNEFT
1	27	91	89	84	47	42	76	14	60	44
2	86	15	83	55	67	23	45	67	89	76
3	20	27	75	76	21	23	45	65	78	98
4	56	35	8	44	43	54	21	44	21	22
5	34	78	54	52	42	98	54	21	43	65
6	26	22	32	44	32	56	87	76	87	43
7	49	44	73	76	65	34	34	43	84	22
8	28	54	34	34	43	45	92	22	45	43
9	75	32	52	87	76	27	85	87	21	65
10	86	32	23	54	34	65	67	34	65	34
11	75	43	75	45	54	45	45	54	76	56
12	74	65	32	23	65	68	54	56	98	65



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13	32	76	39	34	28	78	67	87	65	45
14	28	87	45	65	32	56	65	54	45	83
15	36	85	65	35	45	87	45	65	65	45
16	54	43	43	64	56	45	79	87	34	56
17	42	32	23	45	45	54	58	54	65	78
18	62	26	34	76	65	65	87	34	34	43
19	72	76	57	86	45	34	43	54	45	54

Source: Author

#### **Author Details**

**Akhila KH**, *Research Scholar, Department of Commerce, Alagappa University, Karaikudi, Tamil Nadu, India*

**Email ID:** [khakhila97@gmail.com](mailto:khakhila97@gmail.com)

**Dr. Nedumaran**, *Professor, Department of Commerce, Alagappa University, Karaikudi, Tamil Nadu, India*

**Email ID:** [drmaran3@gmail.com](mailto:drmaran3@gmail.com)