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- <https://www.rbi.org.in/Scripts/PublicationReportDetails.aspx?UrlPage=&ID=1215>
- https://m.rbi.org.in/scripts/bs_viewcontent.aspx?Id=3657
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ANNEXURES

ANNEXURE - I

Questionnaire to Banks

Dear Respondent,

I am Sina E.S., Research Scholar under the guidance of Dr D. Vennila, Assistant Professor (SG), Department of Commerce, School of Commerce and Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Tamil Nadu, India. I request you to participate in this survey, which forms a part of my PhD research titled **Evaluation of Banks' and Customers' Perception towards the Adoption of Sustainable Banking Practices in the select Indian Commercial Banks**. All the information/opinions will be kept confidential, anonymous, and used only for academic research purposes.

Thank you in advance for your support and understanding.

Sincerely

Sina E.S.

1. **Name:**

2. **Designation:**

3. **Please select the bank you are currently employed with:**

- State Bank of India
- Bank of Baroda
- Punjab National Bank
- Indian Overseas Bank
- Canara Bank
- HDFC Bank Ltd
- ICICI Bank Ltd
- Axis Bank Ltd
- Kotak Mahindra Bank Ltd
- IndusInd Bank Ltd

4. **Which state is your bank branch located in?**

- Andhra Pradesh
- Arunachal Pradesh

- Assam
- Bihar
- Chhattisgarh
- Goa
- Gujarat
- Haryana
- Himachal Pradesh
- Jharkhand
- Karnataka
- Kerala
- Madhya Pradesh
- Maharashtra
- Manipur
- Meghalaya
- Mizoram
- Nagaland
- Odisha
- Punjab
- Rajasthan
- Sikkim
- Tamil Nadu
- Telangana
- Tripura
- Uttarakhand
- Uttar Pradesh
- West Bengal

5. Which sector does your current Bank belong to?

- Public sector bank
- Private sector bank

6. Sustainable banking practices adopted:

Directions: Please indicate whether your bank has implemented the following Sustainable banking practices by ticking 'Yes' or 'No'

Statements	YES	NO
Banks are promoting Paperless transactions: Bank statements, product information guides, annual reports to stakeholders, and information to zones/regions are sent as electronic copies. Encouraging the reuse/less use of paper in the daily banking operations.		
Banks are encouraging customers to transform from paper-based banking practices to more sustainable digital alternatives.		
Digitalisation of process: Banks use Internet Protocol (IP) systems to exchange information, including notes (currency) and regulatory sanctions (legal restrictions).		
Banks are switching to energy-efficient and green buildings and renovating existing branches to support renewable energy. (Solar Powered Banks/Branches).		
Banks are becoming fuel-efficient organisations by providing standard transport for a group of officials posted at one office.		
Rainwater harvesting systems are installed and used in the bank branches to promote sustainable water management.		
Banks are promoting gender diversity by providing equal growth and equal employment opportunities.		
Banks are providing Green Channel Counters (GCCs) for customers to deposit/withdraw deposits and fund transfers.		
Banks are offering the facility to open bank accounts online.		
Banks promote UPI-based apps, BHIM app, Digital wallets, Bharat QR codes, USSD-based mobile banking, and Aadhar-enabled payment systems to customers.		
Automation process: Banks are promoting payment automation, biodegradable credit/Debit cards, and contactless card transactions to encourage cashless and paperless transactions.		
Banks are encouraging net banking, mobile banking, Digital currencies, and IVR banking.		
Banks have taken initiatives for financial inclusion and community development through digitalisation		
Banks are providing Cash /Cheque Deposit Machines/solar-powered ATMs./ Passbook Printing Kiosks.		

Statements	YES	NO
Banks are promoting/investing in Green Mutual funds/ Green Bonds, and Green term deposits.		
Banks are investing in/purchasing renewable energy initiatives and products.		
Banks are providing finance for biofuel/bio-gas projects.		
Banks are issuing bonds and loans to support projects with environmental or social benefits.		
Green domestic loans: Solar finance for the installation of solar rooftop/ground-mounted grid connection mechanism, loans to support the mass solarisation mission under the Prime Minister's Surya Ghar initiative.		
Climate finance: Finance and green tariff policies to renewable energy sectors (Solar/Wind) and electric mobility (electric vehicles (EVs), EV charging infrastructure)		
Banks are providing schemes to promote women's/girls' education.		
Banks are providing schemes exclusively for women entrepreneurs.		

7. The benefits of Sustainable banking practices?

Directions: Please indicate your level of agreement. Place a "√" mark in the box of your answer.

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
It helps to reduce the bank's carbon emissions and environmental footprint.					
It enhances the brand image and reputation.					
It improves Shareholder value by aligning with ESG investment priorities.					
It increases the bank's Return on Investment (ROI) through sustainable and profitable ventures.					

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
It contributes to higher profitability and long-term revenue growth.					
It reduces the need for physical branches, call centres, and staff through digital and self-service banking.					
It helps in overall cost reduction and energy saving.					
It improves staff retention and employee engagement.					
It boosts the Bank's accountability to stakeholders (customers, employees, society, and the planet) and improves their confidence, loyalty, and satisfaction.					
It helps to support India's climate targets, SDGs and regulatory frameworks.					

8. The challenges and barriers to adopting Sustainable banking practices?

Directions: Please indicate your level of agreement. Place a "✓" mark in the box of your answer.

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Shifting to energy-efficient/green buildings requires a significantly higher budget.					
Setting up a dedicated department/business vertical for Sustainable finance and ESG-related product innovation increases operating costs.					

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
There is a lack of awareness and training on sustainable banking practices among the Bank staff.					
Inadequate regulations/Policies/lack of ESG-based credit scoring attract risk while offering loans to eco-friendly projects.					
Many customers lack the technical knowledge required to adopt digital and green banking services.					
Banks face competitive pressure from peer groups and increased expectations from customers demanding sustainable banking.					
Lack of standardised tools or frameworks for measuring ESG impact creates implementation barriers.					
Concerns over data security and customer privacy limit the adoption of sustainable banking.					
Time constraints make it difficult for staff to effectively implement and manage sustainability initiatives.					

Thank you for participating in this survey to help us understand the importance of Sustainable practices in Indian banks.

ANNEXURE – II

Questionnaire for Bank Customers

Dear Respondent,

I am Sina E.S., Research Scholar under the guidance of Dr D. Vennila, Assistant Professor (SG), Department of Commerce, School of Commerce and Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Tamil Nadu, India. I request you to participate in this survey, which forms a part of my PhD research titled **Evaluation of Banks' and Customers' Perception towards the Adoption of Sustainable Banking Practices in the select Indian Commercial Banks**. All the information/opinions will be kept confidential, anonymous, and used only for academic research purposes.

Thank you in advance for your support and understanding.

Sincerely

Sina E.S.

1. **Name:**

2. **Gender:**

- Male
- Female

3. **Age (in Years):**

- 20-30
- 31-40
- 41-50
- Above 50

4. **Educational Qualification:**

- HSC/PUC
- Graduate
- Postgraduate

5. **Occupation:**

- Professional
- Self-employed
- Govt.Employee
- Pvt. Employee
- Retired
- Homemaker

6. Name of the Bank where you hold the account:

(Place a "✓" mark in any one of the boxes)

- State Bank of India
- Bank of Baroda
- Punjab National Bank
- Indian Overseas Bank
- Canara Bank
- HDFC Bank Ltd
- ICICI Bank Ltd
- Axis Bank Ltd
- Kotak Mahindra Bank Ltd
- IndusInd Bank Ltd

7. The State it belongs to:

- Andhra Pradesh
- Arunachal Pradesh
- Assam
- Bihar
- Chhattisgarh
- Goa
- Gujarat
- Haryana
- Himachal Pradesh
- Jharkhand
- Karnataka
- Kerala
- Madhya Pradesh
- Maharashtra
- Manipur
- Meghalaya
- Mizoram
- Nagaland
- Odisha
- Punjab

- Rajasthan
- Sikkim
- Tamil Nadu
- Telangana
- Tripura
- Uttarakhand
- Uttar Pradesh
- West Bengal

8. Which sector does your current bank belong to?

- Public sector bank
- Private sector bank

9. Awareness about Sustainable banking practices:

Directions: Please mark your level of awareness. Place a "✓" mark in the box of your answer.

Statements	Extremely Aware	Very much Aware	Moderately Aware	Slightly Aware	Not Aware
I know banks are encouraging customers to shift from paper-based banking practices to more sustainable digital alternatives.					
Bank statements, product information guides, and annual reports are sent to the stakeholders as electronic copies.					
Banks provide Green Channel Counters (GCCs) for customers, which enable them to deposit, withdraw and transfer funds without filling out pay-in slips, withdrawal forms, remittance forms, or					

Statements	Extremely Aware	Very much Aware	Moderately Aware	Slightly Aware	Not Aware
cheques (just swipe the card in the counter and select the desired transaction).					
I am aware of the facility to open a bank account online.					
I am familiar with UPI-based apps, the BHIM app, Digital wallets, Bharat QR codes, USSD-based mobile banking, and Aadhar-enabled payment systems.					
Banks promote payment automation, biodegradable credit/debit cards, and contactless card transactions to encourage cashless and paperless transactions.					
Banks encourage net banking, mobile banking, Digital currencies, and IVR banking (Interactive Voice Response technology automates telephone interactions with callers).					
I know about Cash /Cheque Deposit machines/Solar Powered ATMs/ Passbook Printing Kiosks.					
I have heard about schemes encouraging sustainable farming, microfinance and					

Statements	Extremely Aware	Very much Aware	Moderately Aware	Slightly Aware	Not Aware
MSME loans for renewable energy and health care projects.					
I am aware of Green Mutual funds/ Green Bonds, and Green term deposits.					
Banks offer solar finance for energy-efficient projects/buildings to install solar rooftop/ground-mounted grid connection schemes.					
I am aware of green domestic loans to support the mass solarisation mission under the Prime Minister's Surya Ghar initiative.					
Banks waive the processing fee of auto loans on vehicles (EVs) that use alternate energy sources, like electric cars, scooters and EV charging infrastructure, etc., to their customers.					
Banks provide schemes to promote women's/girls' education.					
I know about schemes exclusively for women entrepreneurs.					

10. Usage of Sustainable banking practices?

Directions: Please indicate how frequently you use these services. Place a "√" mark in the box of your answer.

Statements	Always	Often	Sometimes	Rarely	Never
Green Channel Counters (GCCs)					
Online account opening and e-KYC					
Digital wallets and UPI-based Apps					
Payment automation, Biodegradable credit/debit cards and contactless card transactions.					
Mobile & Net banking					
Cash /Cheque Deposit machines/Solar Powered ATMs/ Passbook Printing Kiosks					
IVR (Interactive Voice Response) banking					
Green domestic loan					
Green auto loan for electric mobility (electric vehicles (EVs), EV charging infrastructure)					
Digital statement and paperless communication					

11. Factors Influencing Customers' Behavioural Intention to Use and Actual Use of Sustainable banking Practices:

Directions: Please indicate your agreement level. Place a "√" mark in the box of your answer.

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Perceived Usefulness					
Sustainable banking practices are user-friendly.					
Sustainable banking practices reduce the need to visit bank branches (saves time and fuel)					
Sustainable banking practices reduce the complexity of my financial transactions.					
Perceived Ease of Use					
Sustainable banking practices involve less paperwork.					
Sustainable banking practices are quick, convenient, and easy to use - anytime, anywhere.					
Sustainable banking practices are Customer-centric.					
Perceived Environmental Commitment					
Sustainable banking practices reflect my commitment to ethical and environmentally					

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
responsible standards.					
Sustainable banking practices contribute to the conservation of natural resources.					
Sustainable banking practices help to reduce the carbon footprint.					
Sustainable banking practices support the reduction and re-use of paper through digital and paperless transactions.					
Behavioural Intention to use					
I intend to use sustainable banking practices whenever possible to reduce my carbon footprint.					
I intend to choose banks that offer environmentally friendly banking services.					
I feel confident in my ability to use sustainable banking practices effectively.					
I intend to be a part of the investment programmes which support projects with environmental or social benefits.					

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Actual Use					
I am interested in being a part of the bank's investments in the Renewable energy initiatives.					
I regularly use digital banking services that minimise paper and energy consumption.					
I choose banks that align with investing in environmentally sustainable practices.					
I frequently use digital wallets and UPI-based apps for payments to reduce the usage of physical currency.					
I have incorporated sustainable banking into my regular financial activities (digital bank statements, payment automation, contactless card transactions, GCC, and IVR) to support sustainable banking practices.					
I have availed/intend to avail of Green auto loans/green domestic loans.					

12. The benefits of adopting Sustainable banking practices?

Directions: Please indicate your level of agreement. Place a "√" mark in the box of your answer.

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Sustainable banking helps reduce the carbon footprint associated with traditional banking operations.					
Practising sustainable banking practices provides me with a sense of contributing to achieving my nation's environmental goals in line with the UN SDGs.					
Adopting sustainable banking practices in my financial activities aligns with and strengthens my ethical values and beliefs.					
Environmentally conscious banking practices enhance my overall banking experience and encourage responsible financial behaviour.					
Paperless and digital services improve my convenience while reducing the environmental impact.					
Online and mobile banking reduce the need for physical visits, saving time and minimising resource use.					
Digital and sustainable banking services provide faster, 24/7 access to services.					
Self-service banking tools support faster service, boost customer confidence, and enhance the overall experience.					

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Sustainable banking offers innovative solutions to environmentally conscious customers.					
Sustainable financing options support eco-friendly and socially responsible projects.					
Sustainable banking practices help me contribute to more environmentally friendly projects and sustainable investments.					

13. The challenges and barriers to adopting Sustainable banking practices?

Directions: Please indicate your level of agreement. Place a "√" mark in the box of your answer.

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Limited or poor internet connectivity creates technical difficulties.					
There is a lack of awareness about sustainable banking practices.					
There is a lack of timely customer support for the digital and sustainable services.					
I have a limited understanding of the benefits of sustainable banking.					
I face challenges due to limited technical know-how.					
I do not have access to gadgets (smartphone/computer)					
I have concerns about data security and privacy while using digital services.					

Thank you for participating in this survey to help us understand the importance of Sustainable practices in banking.

ANNEXURE – III

Approval from the Institutional Ethics Committee

INSTITUTIONAL HUMAN ETHICS COMMITTEE

**Avinashilingam**

Institute for Home Science and Higher Education for Women
(Deemed to be university under Category 'A' by MHRD, Estd. u/s 3
of UGC Act 1956) Re-accredited with 'A⁺⁺' Grade by NAAC.
Recognised by UGC Under Section 12 B
Coimbatore- 641043, Tamil Nadu, India

05.01.2023

Chairman

Dr. Sudha Ramalingam
Director – Research and Innovation
Professor- Community Medicine,
PSG Institute of Medical Sciences
& Research, Coimbatore

Member Secretary

Dr. A Thirumani Devi
Professor
Department of Food Science and
Nutrition

Members

Mr. K. Arulmoli (Legal Expert)
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Ms. D. Kavitha
Dr. A R Sudamani Ramasamy
Dr. G. Victoria Naomi
Dr. Judith Justin
Dr. Anitha Subash
Dr. K. Sampath Rani

To
Ms. Sina, E.S.
Department of Commerce
Avinashilingam Institute for Home Science and
Higher Education for Women
Coimbatore- 641043

Dear Sina,

Ref: Your proposal No. IHEC/22-23/COM-08 entitled
"Adoption of Sustainable Practices in the Indian Banking Sector"
submitted for approval of IHEC on 19.11.2022.

The Institutional Human Ethics Committee of our
University hereby grants approval to your research proposal
No. IHEC/22-23/COM-08 entitled "Adoption of Sustainable
Practices in the Indian Banking Sector" submitted by you. The
Approval number for the same is AUW/IHEC/COM-22-23/XMT-
08.

We wish you all the best in your research endeavours.

Regards


5.1.23
Dr. A Thirumani Devi
Member Secretary
Institutional
Human
Ethics
Committee



Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University Estd. u/s 3 of UGC Act 1956, Category 'A' by MHRD
Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC
Coimbatore - 641 043, Tamil Nadu, India

Appendix L2
(Item No. 5 of Check List)
Details of Research Publications

Checked.

Sl.No	Article	Journal	Other Details Vol/No/Page No/ Year	Published in UGC-CARE / Scopus Indexed/ Web of Science
1.	Does awareness lead customers to use Sustainable banking services? A study using Path analysis	Heritage and Sustainable Development	Vol. 7, No. 1, 2025, pp.573-588 https://doi.org/10.37868/hsd.v7i1.1043	Scopus indexed
2.	Environmental, Social, and Governance (ESG) Adoption in Banking: A Path to a Sustainable Future	International Journal of Business Competition and Growth	Acceptance received	UGC CARE 1

*Proof of a list of Journals from the Internet to be attached along with copies of reprints

Scholar:

D. Venug
22.8.25
Supervisor:

K. Kanniaman
22/8/2025

HoD/Dean of the Respective School

The scholar Mrs. Sina, ES (20PHCOF006) has published two articles in the following journals:

1. Heritage and Sustainable Development - indexed in Scopus from 2019 to present,
2. International Journal of Business Competition and Growth - indexed in UGC Care from June 2019 to present.

This may be considered.

J. J. J.
22.08.25
Asst. Librarian.

Does awareness lead customers to use sustainable banking services? A study using path analysis

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Received Jan. 30, 2025
Revised May 9, 2025
Accepted May 14, 2025
Online Jun. 12, 2025

Abstract

With the global transition of the traditional triple bottom line framework of Planet, People, and Profit to the Environmental, Social, and Governance (ESG) paradigm, it has become imperative for banks to incorporate sustainability within their operations and beyond. The disclosure of the ESG framework and responsible lending has significantly impacted banks' financing choices, particularly in environmentally sensitive regions. This study assesses customers' awareness and usage of sustainable banking services. A structured survey was conducted among 200 customers from 10 commercial banks (20 each from 10 banks) in Coimbatore, India. The questionnaire method was adopted to collect the data. Based on the sustainability theory, the study intends to investigate customers' awareness and usage of sustainable banking services using a path analysis approach. The results show that awareness has a significant direct influence on the usage of sustainable banking services, and this understanding will help in designing a future sustainability framework. This is insightful advice on how policymakers, financial organizations, regulators, and bank managers can create and execute successful designs for sustainable banking operations.

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Keywords: Sustainable banking, Indian commercial banks, Responsible Banking and UN Initiative, Path analysis

1. Introduction

Banks have gradually incorporated Environmental, Social, and Governance (ESG) norms and the Sustainable Development Goals (SDGs) into their operations in recent decades [1]. To promote sustainable banking activities [2], they are also urged to participate in the expanding global climate change governance [3] [4]. Adopting a sustainable strategy goes beyond being environmentally conscious because it has many other advantages, such as lowering risk and the financial institution's costs, improving bank credibility, customers' faith, and image. In general, sustainable banking fulfils both the financial institution's social responsibilities and its business goals. Therefore, for Indian banking firms to remain relevant and prosper in the international market, they must understand their duties regarding the community and the ecosystem [5]. The current research pertains closely to the awareness and usage of sustainability procedures, which have a noteworthy effect on the nation's economic viability. In India, the RBI and other pertinent agencies have established an individualised regulatory

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structure that public and private sector banks must adhere to. Analysing these institutions contributes to a thorough grasp of the regulatory environment in the nation by shedding light on how local governments affect and regulate sustainable methods.

Customers are receptive and willing to embrace the changes introduced by banks' green initiatives. Earlier research highlights that education has a significant positive impact on raising awareness about green banking among the participants [6]. Ordinary people have not yet embraced these services because of a lack of understanding. Consequently, banks should educate their customers on green banking services and adhere to all environmental policies [7]. Acknowledging the need for green banking services and increasing awareness of their significance in society and study is a valuable resource for scholars, policymakers, investors, and regulators when they engage in discussions about green banking services [8].

Banks, as "Socially Responsible Corporate Citizens (SRCC)", have a significant role and obligation in augmenting governmental efforts to reduce carbon emissions significantly [9]. Green banking is a way for banks to participate in sustainable development. The author investigated and contrasted Indian banks' green lending practices regarding their compliance and dedication to environmental protection and environmentally friendly initiatives. Banks in India, it was said, might introduce green financing. Green banking was initially discussed in the early 1990s when the United Nations Environment Program (UNEP) collaborated with the industry to establish environmental management plans after becoming confident that the banking industry's continuous operations could substantially influence the environment [10]. This idea has been discussed for several years.

However, it has yet to be prescriptively characterised by any international organisation, as it depends on specific financial entities distributing capital to specific purposes while including environmental protection. There are also some serious environmental problems. As a result, organisations must give importance to their outcomes to evaluate whether or not they are breaching ecological issues. According to SBI Bank, profit should not be made at the price of the world's most considerable, severe environmental challenges. They support groups ranging from natural food and agricultural businesses to pioneering sustainable energy ventures, recycling firms, and wildlife conservation initiatives. Citizens Bank of Canada has reduced the interest on loans for low-emission vehicles. These initiatives will undoubtedly inspire more banks to adopt green banking, and as a result, environmental challenges may be tackled in the long term.

Banks have made commendable efforts to establish a sustainable banking environment through various banking activities. It highlights the banking industry's financial inclusion, corporate social responsibility, and green banking offerings [11]. Significant financial and environmental effects have resulted from the recent economic crisis, currency instability, and unchecked climate change. To lessen global warming and build a more sustainable future, governments, corporations, and individuals all have a part to play. People need to work with financial institutions, especially banks, which have a crucial role in this by helping to establish a solid and booming low-carbon economy. However, are the customers aware of these sustainable services and use the same? This question must be answered in this study. Banks should incorporate more environmental data in their credit and investment decisions, as they play a crucial role in advancing the UN's Sustainable Development Goals. There is growing demand from consumers, shareholders, employees, and regulators for a solid commitment to environmental, social, and governance (ESG) considerations, which puts pressure on banks to produce positive outcomes.

1.1. Literature review

Green banking is a drive toward sustainability. A study aimed at providing guidelines for sustainable banking products and infrastructure at the branch level also aimed at giving guidelines for bank branches to achieve operational excellence and environmental efficiency [12]. The complications of green banking concerning the Konkan coast of Karnataka also shed light on the importance of "going green" [13]. In a recent study, the authors provided a theoretical framework for assessing the sustainable performance of Indian banks and banks' environmental and social conduct. It also evaluated the impact of environmental and social behaviors on the

sustainability of Indian banks [14]. In a study focused on green banking practices, particularly regarding the State Bank of India, the nature and extent of green banking adoption through environmental management is referred and a framework for its adoption is also suggested [15].

Previously, the finance sector's concern regarding clients' ecologically damaging actions has been equated with intervening or intruding in business affairs [16]. Conversely, it is increasingly realized that dealing with the ecosystem poses a danger to a business. According to the RBI, green banking makes internal bank procedures, physical infrastructure, and IT infrastructural facilities as efficient and productive as feasible while having no or low environmental effects [17]. It introduced green coin ratings and green grading criteria for Indian banks. Under this grading system, banks are rated based on the amount of CO₂ emission from their activities and the quantity of recyclable, refurbishing, and reuse materials employed in their building's amenities and systems, such as servers, computers, printing, networking, etc. They are also rated based on the number of green projects they fund and the awards or recognitions they provide to borrowers for making their company more environmentally friendly. Green banking services assist banking institutions in their attempts to develop sustainably. Many experts shared their perspectives on prior and recent advancements and developments in the financial sector linked to green banking in this context.

In terms of sustainable banking, significant disparities between areas, nations, and banks are identified. In this paper, the author established four stages of banking: defensive, preventative, aggressive, and sustained [18]. Research [19] offered ways for the banking industry to deal with changes and concerns. It will be accepted that reform in the traditional focus on sustainable growth is required to comprehend the banking industry's expansion toward sustainable development, emphasizing the need for changes [20].

In a recently published article, the author discovered four major findings: (a) banks are increasingly discussing climate change business opportunities in their annual reports; (b) 28 of the 40 banks have calculated and disclosed their greenhouse gas emissions from operations; (c) growing demand for climate-friendly financial products and services is driving banks into new markets; and (d) investment banks have taken the lead in supporting emissions trading mechanisms and introducing new products. Such approaches also assist banks in providing first-rate service to achieve customer satisfaction, especially when rivalry among the various types of banks, i.e., public, private, foreign, and others, is fierce [21]. While the banking business is being digitized, networking and the availability of online banking are inevitably gaining traction, "going green" has also been gaining increasing interest for years [22].

Green banking combines operational changes, technology, and changing customer behaviors in the marketplace [23]. Greener banking practices will help the environment and increase operational efficiency, lower vulnerability to manual mistakes and fraud, and save on costs in banking activities. He added that sustainable banking will benefit businesses, industries, and the government. Going green would further help green industries, but it would also allow banks to enhance their asset sustainability in the future. He has identified various advantages of going green [24].

Delgado and Bhome surveyed the actions that may be taken to become green in the banking industry. They assessed knowledge of green banking among bank workers, associates, and the public. They conducted this research by gathering information from 12 banking institutions, 50 bank staff, and 50 general clients. According to the writers, some of the initiatives for turning green should include banking online, green loans, energy-saving equipment, green credit cards, the use of wind and solar energy, and phone banking [25].

Many researchers have studied the sustainable banking services that banks have adopted in developed and developing countries. However, the direct effect of awareness and usage of these practices is comparatively low. There is a vast scope to bring sustainable practices among the customers, provided they know about the same. Therefore, current research is considered an attempt to address the gap by addressing the customers' awareness and usage of sustainable services.

1.2. Theoretical framework

The theory given attention and dominance in the previous literature is the social responsibility theory, a UN-initiated strategy with the help of the International Union to limit growth-based corporate development strategies. This provides a foundation and benchmark worldwide for sustainability practices. However, it helps recognise environmental problems that must be adequately addressed and considered in future strategic policy formulation. Socially responsible investment is ethically motivated by the need for investment, which originated in ancient times.

In this regard, Renneboog et al. stated that there is no consensus regarding the definition of SRI theory [26]. Chatzitheodorou et al. argued that different terms like ethical, social, sustainability, and investments have been used behind the logic of the SRI theory [27]. Other articles stated that SRI theory focuses on the values of individuals and the well-being of society as an essential factor in consideration for investment choice evaluation. Ultimately, SRI has the impact of social investments for the enhancement of social benefits from investors of the community investors.

1.3. Research questions

- Are the customers of commercial banks aware of sustainable banking services?
- The extent to which bank customers use sustainable banking services?

1.4. Objectives of the study

- To understand customers' awareness about the sustainable banking services provided by commercial banks.
- To examine the sustainable banking services used by customers.
- To analyse the association between the awareness level and the usage level of sustainable banking services by customers.

1.5. Hypotheses

- H₀1: There is no significant variation between the population value and sample mean value regarding the awareness of customers about sustainable banking services.
- H₀2: The demographic profile of the respondents does not influence their awareness of sustainable banking:
- H₀3: The awareness level of customers does not have a direct effect on the usage of sustainable banking services.

2. Research method

The descriptive research design used in this study is ideal for elucidating the relationship between awareness and usage of sustainable banking practices. The study was conducted in Coimbatore, Tamil Nadu, India. Coimbatore was identified as one of the fastest-developing metros in India and has been included in the list of smart cities. Further, it is the place where all types of banks exist. The study lasted nine months, from December 2023 to August 2024. A standardized questionnaire investigates the association between awareness and usage of sustainable banking services by customers in Coimbatore city through convenience sampling.

Convenience sampling was chosen for this study due to its practicality and efficiency in collecting data directly from bank customers. This non-probability sampling technique allows data collection from respondents who are readily available and willing to participate, at banking premises during operational hours. This will help to gather a large number of accurate responses within in relatively short time and without extensive logistical planning or resources. Convenience sampling will provide diversity within the sample, even though the selection is non-random. A sample size of 20 respondents per bank was selected to ensure a balanced representation across the institutions selected for this study. This standardized approach helps to maintain comparability between banks, rather than over-representation from a single bank.

The convenience sampling technique may affect the reliability of the findings, since the respondents are selected based on availability, rather than randomization. The sample may not accurately represent the broader customer population of bank customers. This can lead to selection bias. Additionally, factors such as time and location of data collection may skew responses, as certain customer segments could be underrepresented. These limitations are considered while interpreting the results.

Customers of commercial banks, viz. Canara Bank, Bank of Baroda, Punjab National Bank, State Bank of India, Indian Bank, HDFC Bank, ICICI Bank, Axis Bank, Kotak Mahindra Bank, and IndusInd Bank were chosen as sample respondents. The banks were selected based on their turnover as of 31st March 2023. Since the population is unknown, a definite number of 200 had been fixed on the sample size, and 20 each were taken from 10 commercial banks. Frequencies and percentages were used to determine the respondents' distribution patterns concerning variables. ANOVA, independent t-test, one-sample t-test, and path analysis were used in the study to bring out meaningful inferences and findings.

3. Results and discussion

Objective 1: To understand customers' awareness about the sustainable banking services provided by commercial banks.

Table 1b. Customers' awareness about the sustainable banking services provided by commercial banks;
Weighted Mean Score analysis

Variables	Extremely aware	Very much aware	Moderately aware	slightly aware	Not aware at all	Mean	SD	Rank
I am familiar with sustainable practices in banks	23	69	76	23	9	3.370	.9838	X
Information guides and annual reports as soft copies	23	72	63	33	9	3.335	1.0286	XI
Green channel counter	32	68	64	26	10	3.430	1.0634	IX
Opening a bank account through an online	76	66	35	18	5	3.950	1.0692	IV
Digital wallets	68	70	42	14	6	3.900	1.0467	V
Debit and credit cards	108	46	38	6	2	4.260	.9364	III
Net banking/ mobile banking	122	43	23	10	2	4.365	.9414	I
Cash/cheque deposit machine	110	58	20	10	2	4.320	.9175	II
Digital currencies	41	79	50	23	7	3.620	1.0445	VIII
Green mutual fund	32	43	69	40	16	3.175	1.1624	XIV

Variables	Extremely aware	Very much aware	Moderately aware	slightly aware	Not aware at all	Mean	SD	Rank
Green vehicle loans	29	58	73	30	10	3.330	1.0567	XII
Green home loans	24	51	68	34	23	3.095	1.1674	XV
Offering a waiver on interest on loans	34	56	55	44	11	3.290	1.1500	XIII
Schemes to promote women's/girls' education	62	65	46	15	12	3.750	1.1507	VII
Schemes exclusively for women entrepreneurs	65	60	55	13	7	3.815	1.0708	VI
Mean						3.667		

Source: Primary data

The most recognised sustainable practices:

1. Net/Mobile banking
2. Cash/cheque deposit machines
3. Debit and Credit cards
4. Opening a bank account online
5. Digital wallets

Gender-oriented schemes:

1. Women entrepreneurs' scheme
2. Girls' education promotion scheme

Green and sustainable initiatives (lower awareness):

1. Green home loans (lowest)
2. Green mutual funds
3. Interest waiver offers
4. Green vehicle loans

The awareness level about sustainable banking services among consumers of public and private sector banks is delineated in Table No. 1. The data reveals that awareness of sustainable banking services is generally moderate to high, with an overall mean score of 3.667. Respondents show the highest awareness about net/mobile banking (mean=4.365), cash and cheque deposit machines (4.320), and debit and credit cards (4.260), reflecting their widespread awareness. Moderate to high awareness is also evident for services like opening a bank account online, digital wallets, and SDG-related schemes for women and girls, indicating growing engagement with digital and socially inclusive initiatives. However, awareness significantly drops when it comes to green finance products such as green home loans (3.095) and green mutual funds (3.175), which rank lowest. This suggests that, while digital transformation in banking is well communicated and adopted, sustainable and eco-friendly banking practices remain under-recognized and require more focused awareness campaigns and customer education.

Table 2. The usage of sustainable banking services by customers

Sustainable banking services	Always	Often	Sometime	Rarely	Never	Mean	SD	Rank
Green Channel Counters	25 (12.5%)	47 (23.5%)	82 (41%)	28 (14%)	18 (9%)	3.165	1.101	VI
Opening a bank account through an online	87 (43.5%)	36 (18%)	47 (23.5%)	18 (9%)	12 (6%)	3.840	1.245	III
Digital wallets, payment gateway,	77 (33.5%)	36 (18%)	69 (34.5%)	9 (4.5%)	9 (4.5%)	3.815	1.134	IV
Debit and Credit cards	95 (47.5%)	60 (30%)	37 (18.5%)	7 (3.5%)	1 (5%)	4.205	.898	II
Netbanking/Mobile Banking	108 (54%)	51 (25.5%)	30 (15%)	6 (3%)	5 (2.5%)	4.255	.987	I
Cash /Cheque Deposit machines	64 (32%)	53 (26.5%)	69 (34.5%)	10 (5%)	4 (2%)	3.815	1.007	IV
IVR banking	28 (14%)	41 (20.5%)	70 (35%)	38 (19%)	23 (11.5%)	3.065	1.190	VIII
Green home loan	22 (11%)	37 (18.5%)	57 (28.5%)	35 (17.5%)	49 (24.5%)	2.740	1.311	X
loan to purchase an Electric vehicle	26 (13%)	36 (18%)	60 (30%)	24 (12%)	54 (27%)	2.780	1.364	IX
A loan exclusively for women's empowerment	38 (19%)	43 (21.5%)	60 (30%)	22 (11%)	37 (18.5%)	3.115	1.349	VII

Source: Primary data

The most frequently used sustainable practices:

1. Net/Mobile banking
2. Debit and Credit cards
3. Opening a bank account online

Digital and transactional tools (medium-high use)

1. Digital wallets and Cash/cheque deposit machines

Moderately used services:

1. Green channel counters
2. Women entrepreneurs scheme
3. IVR Banking

Least used sustainable services:

1. Green vehicle loans
2. Green home loans (lowest)

The frequency of use of sustainable banking services is displayed in Table 2. The data on the usage of sustainable banking services indicates that digital banking tools are the most used among respondents. Net banking or mobile banking holds the highest usage (mean of 4.255), followed closely by debit and credit cards (4.205), and opening bank accounts online (3.840), reflecting a strong shift toward digital banking preferences. Services like digital wallets and cash/cheque deposit machines also show high adoption (3.815), indicating their convenience and accessibility. In contrast, services related to sustainable finance, such as green home loans (2.740) and

electric vehicle loans (2.780) show the lowest usage levels, highlighting a lack of engagement or perhaps limited availability and awareness. IVR banking and green channel counters show only moderate use, suggesting that they are either less preferred or not widely promoted. Notably, loans for women's empowerment have a modest uptake (3.115), indicating some interest but also potential barriers. Overall, while digital financial services are well-integrated into users' banking activities, there remains a significant gap in the adoption of green and social-focused banking products.

3.1. Hypothesis testing

H₀1: There is no significant variation between the population value and sample mean value regarding the awareness of customers about sustainable banking services.

Table 3. Awareness of customers about sustainable banking; Results of one-sample t-test

Statements	Test Value = 15				95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
I am familiar with sustainable practices in banks	-167.175	199	.000	-11.6300	-11.767	-11.493
Information guides and annual reports as soft copies	-160.378	199	.000	-11.6650	-11.808	-11.522
Green channel counter	-153.874	199	.000	-11.5700	-11.718	-11.422
Opening a bank account through an online	-146.155	199	.000	-11.0500	-11.199	-10.901
Digital wallets	-149.981	199	.000	-11.1000	-11.246	-10.954
Debit and credit cards	-162.208	199	.000	-10.7400	-10.871	-10.609
Net banking/ mobile banking	-159.766	199	.000	-10.6350	-10.766	-10.504
Cash/cheque deposit machine	-164.619	199	.000	-10.6800	-10.808	-10.552
Digital currencies	-154.076	199	.000	-11.3800	-11.526	-11.234
Green mutual fund	-143.869	199	.000	-11.8250	-11.987	-11.663
Green loans	-156.178	199	.000	-11.6700	-11.817	-11.523
Green home loans	-144.222	199	.000	-11.9050	-12.068	-11.742
Offering a waiver on loans	-144.003	199	.000	-11.7100	-11.870	-11.550
Schemes to promote women's/girls' education	-138.262	199	.000	-11.2500	-11.410	-11.090
Schemes exclusively for women entrepreneurs	-147.728	199	.000	-11.1850	-11.334	-11.036

Source: Primary data

The results of the one-sample t-test for customers' awareness level of sustainable banking by commercial banks are shown in Table 3. For all the statements measuring the awareness level of sustainable banking, there is a significant variation between the population value and the sample mean value regarding the awareness of customers about sustainable banking services. For all the listed statements, the p-value (sig.2 tailed) is .000, which is below the threshold of 0.05, indicating a high statistical significance. Moreover, the t-values are strongly negative, and the mean difference across all items is substantially less than the test value of 15, with the confidence intervals not crossing zero. This consistently negative difference suggests that the actual awareness levels are significantly lower than the hypothesized population value. Therefore, we reject the null

hypothesis (H01). This implies that the customers' awareness of sustainable banking services is significantly different from that assumed population mean. This gap can be addressed through targeted awareness campaigns and outreach initiatives.

H₀₂: The demographic profile of the respondents does not influence their awareness of sustainable banking.

Table 4. Awareness of customers about sustainable banking across age, education, and occupation; Results of ANOVA

Demographic variables		Sum of Squares	df	Mean Square	F	Sig.
Age	Between Groups	50.502	41	1.232	1.188	.226
	Within Groups	163.853	158	1.037		
	Total	214.355	199			
Educational Qualification	Between Groups	25.716	41	.627	1.106	.324
	Within Groups	89.639	158	.567		
	Total	115.355	199			
Occupation	Between Groups	126.064	41	3.075	1.209	.205
	Within Groups	401.931	158	2.544		
	Total	527.995	199			

Source: Primary data

The results of the ANOVA test in Table 4 show that none of the demographic variables has a statistically significant influence on customers' awareness of sustainability banking services, since the p-values are greater than 0.05. We fail to reject the null hypothesis. Therefore, it can be concluded that all respondents, regardless of age, educational background, or professional profile, are aware of banks' green activities. The use of debit and credit cards, as well as net and mobile banking, is widespread. Thus, the null hypothesis is agreed upon.

Table 5. Awareness of customers about sustainable banking based on gender; Results of an independent t-test

Demographic variable	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Gender								Lower	Upper
Equal variances assumed	.666	.415	1.489	198	.138	.13167	.08841	-.04267	.30600
Equal variances are not assumed			1.505	194.693	.134	.13167	.08751	-.04093	.30426

Source: Primary data

Table 5 t-test results show that clients' awareness of sustainable banking is not gender- or race-based. The critical values confirm this. Customers of both genders are knowledgeable about green banking. The null hypothesis is, therefore, accepted.

3.2. Validity and reliability test

Cronbach's alpha is a statistic that measures the reliability or internal consistency of a set of items. Here, Cronbach's alpha is measured with an alpha coefficient of .806, the items appear to have a relatively high level of internal consistency. A reliability coefficient of .70 or greater is regarded as "acceptable".

Table 6. Reliability and validity of constructs

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average Variance extracted (AVE)
Awareness	0.870	0.879	0.892	0.360
Usage	0.802	0.814	0.851	0.374

Source: Primary data

Composite reliability is used to evaluate internal consistency in path analysis. The values ranging from 0.6 to 0.7 are "acceptable," and values from 0.7 to 0.9 range from "satisfactory to good." But, the values higher than 0.95 are considered risky and will reduce the validity [28].

The reliability factor of components awareness and usage is observed from Table 6, which says that the composite reliability for awareness is 0.879 and a Cronbach's alpha of 0.870. Likewise, the composite reliability for usage is 0.814 and a Cronbach's alpha of 0.802. Hence, it is concluded that all of the items grouped converge entirely to their respective dimensions, and all items are considered for the study.

H₀₃: The awareness level of customers does not have a direct effect on the usage of sustainable banking services.

The path analysis was conducted, through which awareness of the usage of sustainable banking services was identified. A thorough multivariate analysis is required to determine the true nature of these correlations, as the link between these components is rarely bivariate. Maximum likelihood estimation and a covariance matrix as input were used to evaluate a structural model that included both latent and manifest variables. This kind of analysis gives a thorough picture of the relationships between the relevant predictor and dependent variables.

Table 7. R-squared (R²)

	R-square
Usage	0.480

Source: Primary data

R-squared measures how effectively the model's independent variables account for the variability of the dependent variable. The model's independent variables account for 48% of the variation in the dependent variable in this instance, according to an R-squared of 0.480. Typically, R-square values fall between 0 and 1. If the model explains zero, then no variability can be explained. If the model is one, then all of the variability is presented. Thus, the model's R-square of 0.480 shows a moderate explanatory power level.

Table 8. Path coefficient-Mean, STDEV, T Value, P value

	Original sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistic	P values
Awareness->Usage	0.693	0.714	0.066	10.507	0.000

Source: Primary data

The original sample's coefficient or effect size shows how strongly "awareness" and "usage" are related. A value of 0.693 indicates a significant positive correlation, indicating that usage should increase with awareness. This is the coefficient or effect size from the original sample, indicating the strength of the relationship between "awareness" and "usage". The sample mean is the average of the coefficients derived from several bootstrap samples. A value near the initial sample value (0.693 vs. 0.714) suggests that the data is reliable and consistent.

A modest standard deviation suggests that the coefficient is stable across bootstrap samples, while this shows the variability of the coefficient in the bootstrap samples. This represents the variability of the coefficient in the bootstrap samples. A slight standard deviation (0.066) indicates that the coefficient is stable across bootstrap samples. The t-statistic determines if there is a significant difference between the coefficient and zero. The

association is highly significant, as indicated by the extremely high t-statistic of 10.507. The p-value indicates the probability that the observed relationship occurred by chance. A p-value of 0.000 (often reported as < 0.001) indicates strong statistical significance, meaning there is overwhelming evidence to support a relationship between "awareness" and "usage." The data suggests a strong and statistically significant positive relationship between "awareness" and "usage," supported by consistent coefficients, low variability, and a highly significant t-statistic and p-value.

The results of the path analysis with the standardized regression coefficients for awareness and usage are presented in the figure below.

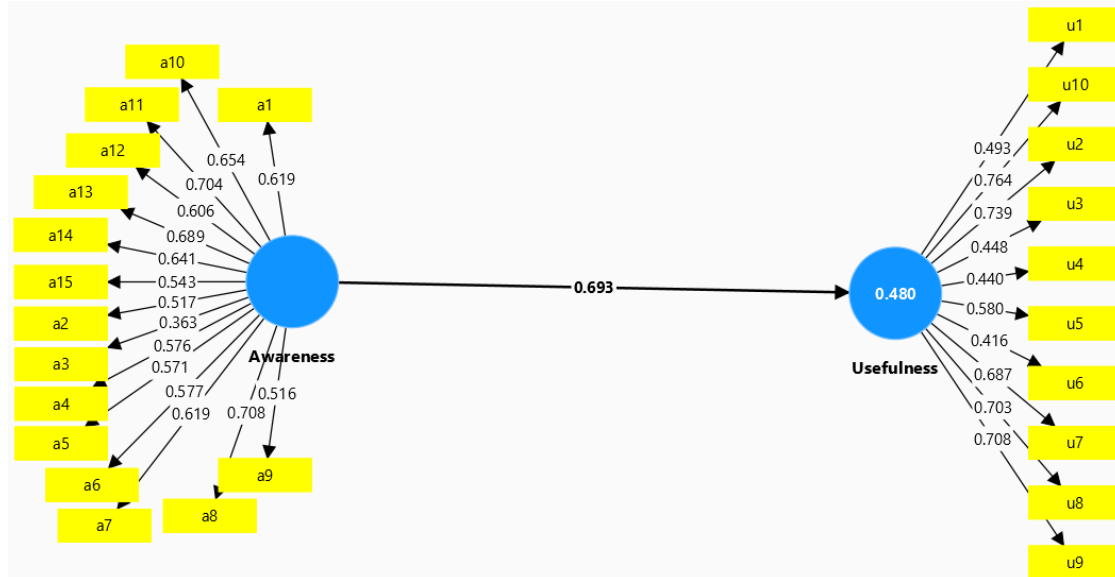


Figure 1. Dependency between awareness and usage of sustainable banking services; Path analysis

The factor loadings, which gauge how strongly each observable variable reflects the latent construct, are shown by the arrows that link indicators to their corresponding latent variables. With a loading of 0.619, indicator a1 represents the awareness construct modestly. Since indicator a12's loading is 0.704, it demonstrates awareness. With a loading of 0.739, the indicator u3 clearly shows usage. With a loading of 0.448, indicator u4 shows a weak reflection of usage. Lower loadings show a weaker association, but higher loadings (around 1) show that the indicator strongly represents the latent variable. The path coefficient (0.693) indicates a strong positive relationship. This suggests that as awareness increases, usage also increases significantly. The arrows connecting indicators to their respective latent variables represent the factor loadings, which measure how well each observable variable reflects the latent construct. Indicator a1 has a loading of 0.619, which moderately reflects the awareness construct. Indicator a12 has a loading of 0.704, indicating it strongly reflects awareness. Indicator u3 has a loading of 0.739, meaning it strongly reflects usage. Indicator u4 has a loading of 0.448, meaning it weakly reflects usage. Higher loadings (close to 1) indicate that the indicator strongly represents the latent variable, while lower loadings indicate a weaker relationship.

4. Discussion

The findings of this study provide valuable insight into customer awareness and the use of sustainable banking services. The results revealed that customers' awareness level is significantly lower than the expected population mean, indicating a critical knowledge gap (H_01 rejected). However, the demographic factors did not significantly influence the awareness levels (H_02 accepted). Suggesting a uniformly low level of awareness across customer segments. Notably, awareness was found to have a strong, statistically significant positive effect on the usage of sustainable banking services (H_03 rejected), with an R-square value of 0.480 and a path coefficient of 0.693. Moreover, the results align with previous empirical research by Tehseen et al. [29], who demonstrated that latent constructs like awareness can significantly predict behavioral outcomes in financial

decision making, and Najmi and Ahmed [30], who highlighted the importance of channel familiarity in enhancing digital financial service usage.

The one-sample t-test confirmed that customers' awareness is significantly below the assumed average, which indicates that green banking remains a conceptual abstraction for many customers rather than a feasible service [31],[32]. This knowledge gap persists despite banks' visible investment in eco-friendly initiatives, such as paperless transactions, green loans, and energy-efficient infrastructure. According to the diffusion of innovation theory [33], awareness is the first step in the adoption process. When potential adopters are not sufficiently informed, innovators fail to move beyond the early adopters into mainstream adopters. This theory explains why, despite technological readiness, customer adoption of green banking remains limited.

The lack of significant differences in awareness levels across age, gender, and occupation aligns with the studies which emphasized that banks focused more on operational green practices, like green efficient branches, than on customer education outreach [32], [34]. These findings align with Institutional theory, which suggests that organizations may adopt environmental practices for legitimacy or regulatory compliance rather than stakeholder engagement. It implies that organisations that adopt sustainable practices are more responsive to social and institutional pressure. These could be the reasons why sustainable banking services are often promoted internally (within operations) but not effectively outwardly (to customers).

The most critical insight from this study is the strong, statistically significant path relationship between awareness and usage of sustainable banking services ($\beta = 0.693$, $p < 0.001$), which supports the theory of planned behaviour [35]. According to TPB, behaviour is driven by intention, which in turn is influenced by attitudes shaped through awareness and belief systems. Customers who understand the environmental and economic benefits of sustainable banking are more likely to engage in using digital banking, opting for electric vehicle loans, or supporting eco-friendly investments. Similarly, this aligns with the TAM [36], which identifies perceived usefulness as the key determinant of actual usage behaviour. The consistency between awareness and usage also supports empirical evidence from the previous research [37], [38], whose studies showed that awareness and perceived value of services significantly predict usage patterns in digital and green financial contexts.

5. Conclusion

The study states that the awareness of sustainable banking services will lead customers to use them. Most of the respondents were aware of and were using sustainable banking services. However, the study also concluded that more initiatives and exposure by banks to their customers would help increase the use of sustainable services. Customers have a positive attitude towards the actions taken by banks, which bring sustainability and responsibility to banking. Customers have a positive attitude towards banks, which can influence businesses to become more sustainable. The customers are open-minded about sustainable banking services and are willing to adopt them. Many factors affect the customer's sustainability awareness, such as education, age, gender, and occupation. However, the findings also indicate that, despite growing awareness, more robust initiatives are needed to enhance visibility and engagement.

5.1. Implications of the study

Through the analysis, whether the awareness level of bank customers leads to the usage of sustainable banking services or not, this paper aims to provide valuable insights to researchers, policymakers, regulatory authorities, stakeholders, and banking officials to promote sustainable banking. The banks, stakeholders, and policy makers must treat sustainable banking as a strategic imperative, not a peripheral concern.

Banks need to rethink product design, customer engagement, and staff training based on the sustainability initiatives. The banks should go beyond the surface-level corporate social responsibility activities and integrate sustainability principles into everyday banking products, offering lower interest rates for green loans and climate-linked investment options. Banks can take initiative to leverage customer analytics to identify

demographic groups with lower awareness or adoption rates and tailor communication campaigns accordingly. Community outreach programs can be given to the customers in rural, semi-urban, and less digitally connected areas. Banks can provide training about sustainable practices and ESG principles among the staff. Banks should regularly publish their Sustainability report, showcasing the sustainability activities carried out internally and externally to the bank. An eco-friendly strategy can be developed to reduce the carbon footprint and enhance sustainability to attract well-informed customers. Furthermore, the findings may aid technical experts in making more informed decisions about future inventions, market share gains through eco-friendly banking products.

The policymakers must provide the regulatory clarity and economic incentives necessary to guide and accelerate this transformation. They must encourage banks to disclose the percentage of environmentally sustainable investments in their financial disclosures. The regulators can develop and enforce a sustainability reporting framework, reducing ambiguity and ensuring consistency across financial institutions. They can introduce fiscal or regulatory incentives like capital relief, tax benefits, and green funding windows for banks that achieve sustainability performance thresholds, and support environmentally critical sectors. The policymakers can initiate industry and academic collaborations to provide capacity-building programs for banking professionals on environmental risk assessments and green financing mechanisms.

The government and the CSR officials must ensure that environmental responsibility is integrated into both external and internal banking operations. They can align social responsibility efforts with the bank's sustainability agenda by focusing on initiatives that promote financial inclusion, digital literacy, and environmental awareness. They can build partnerships with government bodies, NGOs, and climate experts to design programs that address local environmental and social needs while aligning with the global sustainability framework.

Declaration of competing interest

The authors declare that they have no known financial or non-financial competing interests in any material discussed in this paper.

Funding information

No funding was received from any financial organization to conduct this research.

Ethical approval statement

This study on “Does awareness lead customers to use sustainable banking services? A study using Path analysis” was conducted as per ethical guidelines and received approval from the Institutional Human Ethics Committee of Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, India, dated 05th January 2023, (Approval No: AUW/IHEC/COM-22-23/XMT-08). All research methodologies adhered to ethical standards, ensuring compliance with confidentiality, data protection, and informed consent protocols.

Informed consent

This study uses questionnaires. All participants have been fully informed that their anonymity is assured, why the research is being undertaken, how their data will be utilized, and if there are any risks associated with their participation.

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SUSTAINABILITY REPORTING: UNFOLDING ENVIRONMENTAL, SOCIAL, AND GOVERNANCE PRACTICES IN THE BANKING SECTOR

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Abstract

How to cite this paper: Sina, E. S., & Vennila, D. (2025). Sustainability reporting: Unfolding environmental, social, and governance practices in the banking sector. *Corporate Governance and Sustainability Review*, 9(4), 102–113.
<https://doi.org/10.22495/cgsrv9i4p9>

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ISSN Online: 2519-898X

ISSN Print: 2519-8971

Received: 06.05.2025

Revised: 30.06.2025; 13.09.2025;
17.11.2025

Accepted: 24.11.2025

JEL Classification: G21, Q01, Q56

DOI: 10.22495/cgsrv9i4p9

A sustainability report showcases a complete perspective of a banking business, its strategy, and environmental, social, and governance (ESG) disclosure. For the banks, the reporting is based on climate risk, responsible investment, and transparency. This report is unique for each industry, depending on its ESG risks, shareholders' expectations, and sustainability framework. In India, the reporting framework is the business responsibility and sustainability report (BRSR) format, on the nine principles of National Guidelines on Responsible Business Conduct (NGRBC), as per the Securities and Exchange Board of India (SEBI) guidelines. This paper investigates the sustainability reporting practices adopted by Indian banks and explores how these institutions integrate the ESG framework into their reporting. A qualitative content analysis was performed on BRSRs published (fiscal years [FY] 2021-2022 and 2024-2025). Although disclosure volume has risen since the Reserve Bank of India (RBI) consultation, reporting quality remains uneven, only 28 percent of banks align fully with the Task Force on Climate-related Financial Disclosures (TCFD) pillars, and Scope 3 emissions. The pace of alignment with international standards needs acceleration. Integration of ESG reporting and carbon footprint reduction targets is more common in larger banks. The SEBI can make it compulsory for all listed banks to disclose their sustainability report, to disseminate exact awareness among the stakeholders. These findings will contribute to the banking sector and provide insights for policymakers, regulators, and industry stakeholders, with implications for enhancing corporate disclosure standards, fostering sustainable finance initiatives, and advancing the sustainability agenda in India's banking sector.

Keywords: Sustainability Reporting and Financial Integrity, ESG Disclosures, Global Reporting Initiative (GRI), Integrated Reporting, Responsible Banking, Indian Banking Sector

Authors' individual contribution: Conceptualization — E.S.S.; Methodology — E.S.S.; Resources — E.S.S.; Writing — Original Draft — E.S.S.; Supervision — D.V.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

The United Nations' (UN) Sustainable Development Goals (SDGs) propose a comprehensive approach to

sustainability and environmental, social, and governance (ESG). The principles of the responsible banking framework were introduced in 2019 by the UN and signatory banks to embed sustainable

finance across all levels of business. In November 2021, the UN organised the Net-Zero Banking Alliance to align financial institutions' lending and investment portfolios with net-zero and reduce carbon emissions by 2050. This "go green" mission pushed financial sectors to shift from profit maximisation to long-term sustainability. The financial sector, capable of innovations and ESG implementation, is currently at its turning point. ESG considerations are now influencing decisions and operations of the banking industry. For example, banks have shown evolution and solid commitment by investing in renewable energy, lending to sustainably responsible investors, and reducing lending to environmentally challenging industries.

Sustainability reporting is a non-financial statement disclosing a company's performance across ESG dimensions. It provides transparency about corporate initiatives, risks, and commitments to sustainable development. A company's commitment to ESG and its progress in achieving the Net Zero Initiative by presenting the organisation's principles, governance, strategies, and commitment is shown in the report. This will help companies showcase their ESG performances, corporate social responsibility (CSR), and improve their goodwill, reputation, customer satisfaction, and risk management. The terms "sustainability reporting", "triple bottom line reporting", and "corporate social responsibility reporting" are interchangeable when referring to non-financial reporting. The sustainability report serves as a strategic base for an organisation's sustainability impacts and vision, whether favourable or unfavourable. Sustainable reporting encourages organisations to take the lead in creating and maintaining conviction and transparency. Stakeholders are crucial in helping non-financial organisations understand these risks and opportunities (Jeke et al., 2025; Debnath et al., 2024).

In the Indian financial sector, the Reserve Bank of India (RBI) has played a vital role in accelerating ESG integration. The draft disclosure framework on climate-related financial risks (RBI, 2024) and the framework for acceptance of green deposits (RBI, 2023) are the regulatory initiatives that push banks towards adopting transparency in reporting ESG disclosures. The content, preparation, and presentation of the business responsibility and sustainability report (BRSR) are in accordance with the nine principles of the National Guidelines for Responsible Business Conduct (NGRBC) and the format issued by the Securities and Exchange Board of India (SEBI). In India, the sustainability reports adhere to the Global Reporting Initiative (GRI) framework, and there has been a noticeable move towards international standards, which the existing literature reviews have validated. Banks that integrate GRI may benefit from enhanced stakeholder engagement and transparency. The banks are required to highlight sustainability-related challenges faced and plans for ESG-related targets. To acquire insights into ESG data, banks must collect the appropriate data and implement cognitive analytical tools. ESG adoption in banking is challenging and requires advanced technical knowledge and ability (Bressan & Sabrina, 2025; Voto, 2025). Additionally, banks must emphasise automated processes and invest in a robust data and analytics infrastructure. This paradigm shift requires a cultural transformation within banks, and it is essential to educate staff members so they can accept and comprehend the implementation of policies and procedures.

Over the last twenty years, several frameworks and standards have been designed to help financial institutions comprehend and incorporate sustainability challenges into their corporate strategy. National voluntary guidelines (NVGs) introduced by the government of India in 2011 are the most developed framework for responsible reporting in India. These are principles and frameworks that aid businesses in fulfilling their ESG responsibilities. The GRI is an independent, international non-governmental organisation (NGO) that helps the government and other businesses with ESG reporting. GRI became the preferred framework to report on the three pillars of sustainability, ESG. In the ESG disclosure, almost 93% of the world's largest corporations across 100 countries, including government, small businesses, large businesses, and corporations, adhere mainly to the GRI standards (Kumar & Prakash, 2019a). GRI provides support in understanding and communicating how business decisions affect essential sustainability issues, including climate change, human rights, and corruption, among many others. The Dow Jones Sustainability Index (DJSI) participation is a company's involvement in a global benchmark for assessing corporate sustainability, to showcase their commitment to sustainable practices and their efforts to investors, customers, and other stakeholders. The DJSI evaluates the performance of companies based on their ESG practices. The stakeholder theory was introduced by Edward Freeman in 1984 and emphasises the importance of considering the interests of all stakeholders in decision-making (Freeman, 2010). The theory suggests that while the business focuses on maximising profits, it should also aim to create value for all stakeholders to protect sustainability and ethical business practices. In this context of sustainable reporting, this theory complements the broader discussion on sustainable business practices and helps to understand how reporting ESG factors is integrated into the decision-making process within the banking industry. Institutional theory highlights the role of institutional pressure, such as regulations, norms, and values, in shaping organisational behaviour, often leading to adopting the practices of other successful organisations. In this context of sustainable reporting, institutional theory can explain how financial institutions report their ESG practices due to pressures from regulatory bodies, industry standards, or public expectations of responsible behaviour. Socially responsible investing (SRI) originated in 1972 and played a significant and dominating role in previous literature. This theory originated when the UN and the International Union joined forces to develop strategies for corporate growth. Renneboog et al. (2008) stated that SRI initiated in ancient times had no universality or unanimity. Chatzitheodorou et al. (2019) observed that terms like ethical, social, sustainability, and investments were associated with the SRI theory. However, van Dooren and Galema (2018) linked that SRI theory, emphasising individuals' values and the well-being of society as an essential factor in sustainability reporting.

The study provides the next research questions:

RQ1: How extensively do banks report their approach towards ESG considerations?

RQ2: What Sustainability indicators do banks highlight in their sustainability report?

Also, the study provides the next research objectives:

- to examine the sustainability reporting practices adopted by Indian banks and evaluate their alignment with the ESG framework;
- to identify the sustainability indicators commonly reported by banks, with a focus on the ESG dimension.

This study offers two principal contributions that distinguish it from existing sustainable reporting by Indian banks. First, it delivers a multi-framework comparison of India's 10 largest public and private sector banks, triangulating their disclosures across global standards (GRI, Carbon Disclosure Project [CDP], DJSI), national guidelines (e.g., NVGs), and quantified outcomes (CO₂ intensity and CSR expenditure). This holistic approach exposes alignment gaps and leadership patterns that single-framework or single-pillar analyses miss. Second, by integrating qualitative insights from each bank's sustainability narrative with quantitative metrics (emissions and five-year CSR outlays), the study reveals how strategic intent, sector ownership, and scale shape ESG performance.

The structure of this paper is organized as follows. Section 2 aims to build a theoretical foundation upon which the research is based by reviewing the relevant literature to identify research issues that are worth researching. Section 3 describes the major methodology used to collect the data, which will be used to answer the hypotheses. Section 4 presents patterns of results and analyzes them for their relevance to the research questions or hypotheses. Section 5 provides the conclusion.

2. LITERATURE REVIEW

Sustainability and other non-financial indicators (any data reported by the company other than financial data) are becoming more important to business leaders, investors, consumers, and regulators. Nowadays, many companies understand how important it is to support social and environmental issues in their reporting. Businesses striving for corporate social and environmental reporting are becoming more credible and acceptable (Hongming et al., 2020). Sustainability reporting makes the companies socially conscious and ethically responsible. According to Petrescu et al. (2020), leading Romanian businesses could increase customer loyalty and reputational trust through sustainability reporting. The reporting will help the companies establish a reputation management strategy to enhance and restore a brand's image. Sustainability reporting has evolved significantly, becoming crucial for businesses to communicate their ESG practices. This practice is guided by various frameworks and standards, aiming to promote transparency and accountability in corporate operations. However, a key component that has often been underrepresented in these standards is diversity. According to Zrnić et al. (2020), diversity should be explicitly incorporated into sustainability reporting guidelines, as it plays an essential role in managing risk and improving financial access. The study emphasises that the impact of diversity on risk management can help companies better navigate challenges and attract financial resources. Incorporating diversity into sustainability standards contributes to more comprehensive reporting and enhances a company's ability to effectively address emerging risks and leverage financial opportunities.

Initially, the structure and substance of sustainability reporting were unclear and could not be compared to financial reporting criteria. When disclosures from annual reports regularly described reporting procedures, it was a common reporting practice in the 1990s. The patterns of sustainability reporting by multinational corporations are the subject of specific studies, such as those conducted on the Fortune 500 (Zharfpeykan & Askarany, 2023). Following the Rio+20 or UN Conference on Sustainable Development, nations like France, South Africa, Brazil, and Denmark started encouraging sustainability reporting. The UN Environment Programme (UNEP) and the GRI supported these countries in pursuing sustainable development (Hongming et al., 2020). The banking sector plays a vital role in developing India's national economy. For reporting purposes, the banking industry in India continues to use the conventional financial reporting method. On the other hand, not much has been done to address the issue of sustainable reporting in the Indian banking industry. This study aims to assess the state of the Indian banking industry's sustainability reporting system and enhance its quality. The study's conclusions can be used as a reference to help the banking industry's regulating body in India enhance the sustainability reporting's current state and consequences. Globalisation makes the business environment more and more complex, and today's businesses worldwide face more challenging and dynamic environments than ever (Amran & Ooi, 2014). Sustainable development was a concept launched in the late 1980s, and the UN's Brundtland report defined it as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (UN Secretary-General & World Commission on Environment and Development [WCED], 1987). Investors need accurate information while making investment decisions.

Sustainability reporting deals with environmental issues and considers economic and social issues, labour practices, human rights, economic performance, community, society, corruption, corporate governance, and responsibility for products and services. While there has been a surge in CSR reporting by Indian companies, sustainability report disclosure is still in development (Goel & Misra, 2017). Since the banking industry plays a role in advancing sustainable development, examining the state of sustainability reporting standards in the Indian banking sector is relevant.

Kumar and Prakash (2019a) proposed a GRI G4-based hybrid framework to assess the sustainability disclosure practices of Indian commercial banks. Their study investigates 28 banks, evaluating their contributions to environmental, economic, social, and governance indices. The findings indicate variability in sustainability performance among banks, highlighting the need for standardised reporting practices to enhance transparency and comparability. Arora et al. (2025) evaluated the quality of sustainability reports in the Indian banking industry. Their study examines how factors such as bank ownership, market capitalisation, and board composition influence the quality of disclosures. The research concludes that while there has been progress in sustainability reporting, significant improvements are needed to meet global standards and stakeholder expectations.

3. RESEARCH METHODOLOGY

An explanatory research design has been adopted in the current study based on the argument presented by Asenahabi (2019) and Tonon (2019). Explanatory research design aids in unravelling why a particular phenomenon occurs. Descriptive research is also conducted when limited research information is available regarding the topic, which also suits the aspect of the current study. There is limited information from prior studies regarding how banks prepare and publish sustainable reports, and there is ambiguity regarding the standards and formats to be followed. The locale of study is India. The 10 major public and private banking institutions have been selected based on market capitalisation and the presence of branches throughout the country. These aspects have been combined to establish major banking institutions that will represent the state of the banking system throughout the economy.

The study is based on secondary data. An audited sustainability report is published along with the audited financial statements at the end of every financial year by the selected banks is considered as the data. Details for various branches, offices, and other locations (excluding international operations) are to ensure the completeness of data required for the research. Also, a discussion with the relevant personnel of the Bank's management responsible for ESG/their team member, for understanding the process of collecting, collating, and reporting the subject matter was also considered.

Table 1. The top 10 banks in India, ranked by their market capitalisation

Bank	Market capitalisation	Branch presence
State Bank of India	5,00,179.88	22,219
Punjab National Bank	83,518.55	12,248
Bank of Baroda	1,00,272.71	8,432
Canara Bank	71,005.06	9,720
Union Bank of India	79,239.07	8,700
HDFC Bank	1,160,931.09	6,449
ICICI Bank	649,129.59	5,275
Kotak Mahindra Bank	347,162.17	4,758
Axis Bank	314,549.56	5,604
IndusInd Bank	114,929.78	2,015

Source: Authors' analysis based on "Top 10 banks in India" (2025).

For this, the entire customer base throughout India has been selected as the population for each banking institution. The banks' Sustainability reports, CSR reports, BRSR, and annual reports (fiscal years [FY] 2022-2023 and 2023-2024) were analysed. Since the annual report is the most accepted document for corporate communication in India, this study only focuses on the published financial statements of those selected banks. The Sustainable report is published at the end of every year, disclosing the ESG commitments and the banks' progress towards them. The annual reports of the selected banks were analysed based on ESG and other categories selected from the GRI G4 guideline.

4. RESULTS AND DISCUSSION

The State Bank of India exhibits the most comprehensive approach, demonstrating full compliance with GRI standards and active participation in the CDP, where it reported significant carbon

emissions of approximately 25,000 tons of CO₂ in FY 2024. Despite not being listed on the DJSI, State Bank of India integrates international sustainability principles and exhibits strong adherence to the NVGs, with a reporting structure emphasising governance and social responsibility. In contrast, Punjab National Bank shows partial alignment with GRI standards, particularly in social metrics, and a growing engagement with the CDP, having disclosed emissions of 14,500 tons of CO₂. Punjab National Bank's adherence to NVGs and inclusion of GRI G4 elements indicate a developing sustainability framework, particularly in governance and stakeholder engagement. Bank of Baroda also reports partial GRI compliance, focusing on environmental and social aspects, and participates in CDP with emissions of 9,500 tons of CO₂, aligning its practices with broader sustainability norms despite its absence from DJSI listings. Canara Bank stands out for its full GRI compliance, especially in environmental performance, and limited but targeted CDP engagement, reporting 6,800 tons of CO₂ emissions in FY 2024. While not part of DJSI, it reflects robust adherence to NVGs and substantial integration of GRI G4 guidelines, particularly concerning governance and environmental issues. Similarly, Union Bank of India follows GRI standards with a pronounced focus on environmental sustainability and CDP participation, having reported 5,200 tons of CO₂ emissions in FY 2024. Although it is not DJSI listed, Union Bank of India maintains strong sustainability disclosures and aligns with NVGs, with partial implementation of GRI G4 in governance and stakeholder engagement.

Among the private sector banks, HDFC and ICICI banks emerge as leaders in ESG transparency and international alignment. Both institutions are fully compliant with GRI standards and actively participate in the CDP, reporting substantial carbon emissions — 36,000 tons and 29,000 tons of CO₂, respectively, in FY 2024. Their inclusion in the DJSI further reflects their strong global ESG performance. HDFC Bank demonstrates comprehensive integration of GRI G4 guidelines with a focus on ethical, transparent operations, while ICICI Bank similarly aligns its disclosures with NVGs and GRI G4, emphasising governance and corporate responsibility. In comparison, Axis Bank follows GRI standards and maintains active CDP engagement, reporting 24,000 tons of CO₂ emissions. Though not listed on the DJSI, it maintains a transparent ESG framework grounded in NVG principles and integrates GRI G4 in environmental and governance reporting. Kotak Mahindra Bank exhibits partial adherence to GRI G4, concentrating on social and environmental performance with limited CDP participation focused on carbon and energy metrics. Despite the absence from DJSI, it upholds NVG principles, especially in governance and business ethics. IndusInd Bank, while showing partial GRI alignment, particularly in social and environmental areas, and minimal CDP engagement, aligns with NVGs in governance and ethical conduct. It incorporates select GRI G4 elements into its sustainability reporting.

An analysis of the ESG initiatives across 10 major Indian banks highlights varied but progressive, maturing approaches to sustainability. State Bank of India demonstrates a robust ESG framework, with environmental efforts focused on reducing carbon intensity and advancing green finance. Socially, State Bank of India leads in financial inclusion and rural development through

initiatives like “State Bank of India Gram Seva”, while governance is underpinned by a diverse, broad, and strong compliance protocol. Punjab National Bank mirrors these commitments, implementing energy audits and solar installations, along with targeted social inclusion strategies and a governance structure centred on ethical oversight. Bank of Baroda integrates sustainability into its operational and financing activities, particularly through emission reduction and rural economic support, with governance grounded in risk management and ethical conduct. Canara Bank and Union Bank of India of India reflect similar orientations. Canara Bank emphasises energy efficiency and solar power, while engaging in rural outreach and gender-focused initiatives under a framework of legal and ethical governance. Union Bank of India’s strategy includes investment in renewable energy and inclusive finance, with governance anchored in transparency and risk control.

Among private sector banks, HDFC Bank stands out for its leadership in green energy adoption, carbon reduction, and green bond issuance. Its social agenda spans digital inclusion and community development, while governance is marked by independent oversight and regulatory diligence. ICICI Bank similarly combines environmental initiatives, such as emission control and green certified infrastructure, with strong social engagement through microfinance and leadership diversity. Its governance practices stress anti-corruption and regulatory compliance. Kotak Mahindra Bank adopts a moderate yet consistent ESG approach, reducing its carbon footprint and expanding renewable energy use, while supporting financial literacy and women’s empowerment within a framework of high ethical standards. Axis Bank integrates environmental sustainability through renewable energy investments and fosters rural inclusion and board diversity. IndusInd Bank emphasises green lending and solar adoption, and its social and governance practices are defined by gender inclusion, rural outreach, and transparency.

The Banks display a deepening integration of ESG principles, with public sector banks often emphasising rural and financial inclusion, and private sector institutions focusing more on innovation in environmental financing and governance, which aligns strategic sustainability goals with robust operational and governance practices.

Banks play a crucial role in promoting CSR and driving the global shift away from carbon-emitting businesses. CSR encompasses a company’s ethical and voluntary initiatives aimed at contributing to social, environmental, and economic well-being, such as community development, environmental protection, and employee welfare. Through sustainable reporting, these initiatives, along with broader ESG efforts, are documented and communicated to stakeholders. This brings transparency and accountability to the banking operations.

CSR expenditure emerges as a key quantifiable indicator under the social pillar of ESG. This is an integral part of the bank’s sustainability strategy and ESG disclosure. By disclosing this through sustainable reporting, banks demonstrate

transparency, stakeholder accountability, and their evolving role in sustainability. Banks need to accelerate their transition to sustainability and be transparent and accountable due to the pressure from investors, regulators, and customers. As financial intermediaries, the banks need to take initiatives towards sustainability on a faster track because of the disastrous effects of climate change. The banks are already feeling pressure from their stakeholders, customers, and regulators.

The data presented in Table A.2 (see Appendix) highlights the growing emphasis placed by Indian banks on CSR. A review of the FY 2024 sustainability and CSR disclosures reveals considerable variation in the scale and focus of investment among banks, alongside a progressive shift toward integrated and strategic ESG reporting. The State Bank of India leads in cumulative CSR investment with an expenditure of 1,500 crore over five years, as documented in its sustainability report of FY 2023-2024. This sustained commitment underscores State Bank of India’s strategic focus on rural development, education, and environmental initiatives, aligning with both global sustainability goals and national priorities. Punjab National Bank, in its annual ESG and sustainability report, reported an annual CSR spend of 300 crores, reflecting its active engagement in community-centric development, particularly in rural financing and women’s empowerment. The consultation of ESG and CSR activities in the report marks a transition toward more integrated sustainability disclosure. Bank of Baroda and Canara Bank also show a substantial CSR engagement, spending 220 crores and 250 crores, respectively. Bank of Baroda’s balanced focus on education, environment, and rural development signals a medium-scale but steady commitment, while Canara Bank aligns its CSR with sustainable banking and ethical governance. Union Bank of India, with 210 crores in CSR expenditure, utilises an integrated reporting model that combines financial and sustainability disclosures, indicating a mature approach to ESG transparency.

In the private sector, HDFC Bank stands out with a CSR spend of 450 crores, directed at digital inclusion, healthcare, and environmental sustainability. Its annual ESG report signals both financial capacity and strategic depth in CSR execution. ICICI Bank follows closely, investing 330 crores, with a clear emphasis on inclusive finance and environmental responsibility. Axis Bank also demonstrates significant CSR commitment, with over 400 crores allocated across social initiatives. These three banks invest heavily in CSR and also reflect a strong alignment between business strategy and Sustainable development.

At the same time, Kotak Mahindra Bank and IndusInd Bank exhibit more targeted CSR models. Kotak Mahindra Bank’s INR 85 spend, though modest, is directed at high-impact areas like women’s empowerment and environmental conservation, indicating a focused rather than a broad-based strategy. IndusInd Bank reports the lowest CSR expenditure at 50 crores, yet prioritises healthcare, education, and renewable energy, consistent with its emphasis on sustainable finance.

Table 2. CSR spending by the Indian banks as a part of their sustainability initiatives

<i>Bank</i>	<i>Name of the report</i>	<i>CSR spend (INR)</i>
State Bank of India	Sustainability report for FY 2024	1,500 (5 years)
Punjab National Bank	Annual ESG and sustainability report for FY 2024	300 (FY 2024)
Bank of Baroda	ESG and sustainability report for FY 2024	220 (FY 2024)
Canara Bank	Sustainability and CSR report for FY 2024	250 (FY 2024)
Union Bank of India	Annual integrated report and ESG disclosures for FY 2024	210 (FY 2024)
HDFC Bank	Annual ESG report 2024	450 (FY 2024)
ICICI Bank	ESG report (2024) — Driving sustainable growth	330 (FY 2024)
Kotak Mahindra Bank	Sustainability and CSR report for FY 2024	85 (FY 2024)
Axis Bank	Annual ESG and sustainability report 2024	400 (FY 2024)
IndusInd Bank	Annual sustainability report for FY 2024	50 (FY 2024)

Source: Authors' analysis based on banks' annual reports.

The results state that Indian banks predominantly follow the practice of Sustainability reporting. However, these banks must adopt sustainability reporting practices faster, adhering to international standards. The State Bank of India is one of the primary banking institutions in the country. It got its current form in 1955 and has a market capitalisation of above INR 5 trillion (State Bank of India, 2024). State Bank of India ensures sustainability by creating pathways for Net Zero Scopes 1, 2, and 3 emissions and facilitating green advances and promoting ethical behaviour and culture (State Bank of India, 2024). Punjab National Bank was established in 1984. With a capitalisation of around INR 900 billion, it is the country's third-largest public sector banking institution in terms of business volumes (Punjab National Bank, 2024). Punjab National Bank has already achieved Scopes 1, 2, and 3 for carbon emissions (Punjab National Bank, 2024). Bank of Baroda is a public sector bank with a capitalisation of above INR 1 trillion. Bank of Baroda also achieved Scopes 1, 2, and 3 in carbon emissions (Bank of Baroda, 2024). Canara Bank is also one of the central public sector banks, which was established in 1906 and was merged with a syndicate bank to become the fourth largest public sector banking institution with a market capitalisation of above INR 700 billion (Canara Bank, 2024). In 2024, the bank achieved an 18.82% reduction in Scopes 1 and 2 emissions (Canara Bank, 2024). Union Bank of India was established in 1919 and was formed as a merger of a corporation bank and Andhra Bank. It has a market capitalisation of over INR 800 trillion (Union Bank of India, 2025). The Union Bank of India evaluates its exposure to climate change and its progress toward ESG by using several metrics. The Bank reports the emission of Scopes 1 and 2 greenhouse gas emissions from its operations in its BRSR disclosures. The report provides detailed information about the initiative to promote waste management, energy consumption, water consumption, and renewable energy usage. (Union Bank of India, 2025). HDFC Bank is the largest private sector banking institution in India of above 12 trillion, and it has also become the fifth largest in the world after the acquisition of HDFC Bank (2024). This bank rigorously published its Sustainability report from 2012, and this bank already started its initiative towards Net Zero. The bank could achieve Scopes 1 and 2 emissions by 10% over the next two to three years as part of our commitment to climate change (HDFC Bank, 2024). ICICI Bank (2024), with a market capitalisation of around INR 6 trillion, has been one of the major private banking institutions with a presence in banking operations in about 17 countries. A long-term plan for improving sustainability and achieving carbon neutrality in Scopes 1 and 2 emissions has

been developed by ICICI Bank. Decreased its overall Scopes 1 and 2 emissions by 15.7% in FY 2024 compared to the previous FY (ICICI Bank, 2024). IndusInd Bank was inaugurated in 1994, and with a market capitalisation of above INR 1 trillion, it was earlier focused on serving non-resident Indians. However, it later moved to normal operations and collection of taxes (IndusInd Bank, 2024). To promote sustainability and social equity, the bank has aggressively sought opportunities to grow its ESG-related operations across multiple business divisions this year. These include green, social, and sustainability-linked loans to help corporate clients on their decarbonisation path; IndusWE, which assists women entrepreneurs; and Indus Solar, which promotes solar rooftop installations for the bank's micro and small enterprise clients. The bank has created a thorough plan to become carbon neutral by 2032, integrating environmental responsibility and social impact into its operations. This is demonstrated by their emphasis on carbon footprint reduction and sustainable investing, which goes beyond conventional corporate responsibility.

5. CONCLUSION

Financial inclusion, financial literacy, energy-efficient technology, and other sustainability responsibilities should be the priority of the banks' business operations. Most Indian banks still need to address environmental consideration indicators. According to the review of sustainability reporting of the selected banks, they are placing a greater emphasis on sustainability disclosure to assess, educate, and respond to internal and external stakeholders about ESG factors. However, a meaningful commitment to sustainable disclosure is required. This practice cannot be implemented in any other way.

Sustainable disclosure practices will improve the trust of financial institutions among the stakeholders. Non-financial performance should also be evaluated and included. The RBI and the government can take some initiatives to ensure this. Subsequently, the central government can make sustainable disclosure practices mandatory in India, improving India's performance in the GRI index. Governments can incentivise banks to properly implement sustainable disclosure practices, such as tax exemptions or rebates, an extension of the tax holiday facility, etc. The RBI has the authority to promptly implement regulations requiring all banks to adhere to sustainable disclosure practices and to impose fines on those that do not.

If required, the Sustainable Accounting Standard Board can improvise the sustainable reporting indicators. These reporting guidelines

that banks can use as a reference for starting and executing sustainable disclosure practices. Consumers' and investors' awareness of sustainable disclosure can be significant when standardising sustainable reporting. Consumers should avoid bank relationships that do not adhere to sustainable disclosure reporting norms and instead conduct more business with banks that do. The bank authority may set up specialised training programmes to improve the proficiency and effectiveness of accountants in sustainable disclosure. Accounting experts can help in this area by developing and improving the curricula on sustainable reporting challenges. As a matter of inclusivity, the banks can take the steps to prepare their branches/automated teller machines and offices to be accessible to differently abled employees, workers, and customers. Ramp facility and disabled-friendly amenities can be fixed. Banks can also provide doorstep delivery of financial services to differently abled customers. To promote energy conservation, electric vehicle charging stations can be installed, at least in the head offices/main corporate offices. While making the material purchases, like electrical and electronic equipment, a minimum threshold of star ratings can be fixed.

The traditional planet, people, and profit have evolved to ESG. So, financial institutions are prioritising responsible banking and committing to a sustainable future. This happens through responsibility, vigilant banking, and sustainable reporting. The recent growth towards ESG reporting can be exemplified by a 53% ESG strategy implementation in central scheduled commercial banks in India by January 2022. Many factors influence banks to adopt ESG: peer pressure, competition, and customer demand. The HDFC Bank, State Bank of India, ICICI Bank, and Axis Bank positions on the list indicate that they are firmly committed to managing ESG risk. A survey by DBS Bank (2024) showed 65% of Indian businesses engaged in ESG reporting and compliance. This study shows Indian banks implementing sustainability reporting standards more slowly. It was discovered that concerns of sustainability, which are among the banks' priorities, are closely tied to how their businesses operate. These issues include energy-efficient technology, financial inclusion, and literacy. Most Indian banks underprioritize environmental concerns. Although the adoption of sustainability reporting was disregarded at first, gradually, banks are improving in this area, and the trends are upward.

Moreover, the demand for sustainability reporting helps firms manage their social and environmental impacts and improve operational effectiveness and resource stewardship. It also strongly influences shareholder, employee, and stakeholder relations. According to the study, only a few banks disclose sustainability reports, which need to be improved. Additionally, it was discovered that the information addressing sustainable reporting was required to adhere to GRI requirements. It may result in increased reporting requirements for reporting entities and information overload for report consumers (Chartered Institute of Public Finance and Accountancy [CIPFA], 2010). Banks should begin the practice of sustainability reporting as a responsive organisation to society. NGOs could push governments to force businesses to adopt sustainable reporting practices and promote investors' long-term thinking (Eccles & Serafeim,

2015). The government of India and the body in charge of financial sector regulation have a significant role to play. All regulators and civil society should require a sustainable reporting culture to guarantee good governance and improved transparency. It will ultimately address governance issues, make our cherished world more sustainable, and boost India's banking industry's efficiency and effectiveness.

The current analysis offers insightful information about the sustainable reporting procedures Indian banks follow. Additionally, this study broadens the body of knowledge that banks and other stakeholders can use to better understand the barriers to standard sustainable reporting that the Indian banking sector experiences. It provides an additional opportunity to elevate sustainability disclosure to reach international standards.

The study's main objective was to analyse sustainable reporting practices and their implications for the Indian banking sector. By assessing the concepts related to these parameters, the study advances existing comprehension of how sustainability as a discipline interacts with and impacts India's banking sector. The project aims to develop a new paradigm that integrates the concepts of sustainability and environmentally friendly practices in commercial banking institutions by utilising theoretical concerns from several sustainability disciplines, bank financial performance, and resource and asset investments. Because of this, the framework developed will be crucial for future researchers who wish to conduct additional studies in this area. Furthermore, the study will add knowledge about sustainable banking offerings, development potential, bank profitability, process scalability, eco-friendly strategy investments, and customer involvement. As a result, the corpus of knowledge in academia will expand to include fresh perspectives, conceptual frameworks, and theoretical insights on sustainability, environmentally friendly practices, bank performance, and profitability.

Financial institutions can identify the driving forces, advantages, difficulties, and significance of reporting sustainable practices. This research aims to provide valuable insights to researchers, bank supervisors, banking experts, customers, and associated parties who seek to maximise bank expansion and financial gain while concurrently regulating their ecological footprint. By learning from the research, bank managers, executives, and lawmakers can develop essential eco-friendly strategies and approaches to reduce their carbon footprint to enhance sustainability and attract well-informed customers. Furthermore, the research may aid technical specialists in making more informed decisions about future inventions, market share gains through eco-friendly methods, and resource allocation. Additionally, by emphasising consumers' actions to support a healthy environment, the study provides valuable advice to those willing to support sustainability.

The study has examined significant practical consequences in sustainability reporting by Indian banks. Still, the secondary data chosen is from the published articles and financial statements of the banks for a selected period only. However, the results may differ later. Thus, a longer-term study could provide additional light on the patterns in the Indian banking industry's sustainable reporting procedures. A mixed-method study may prove to be viable in this context. Secondly, apart

from public sector banks, regional rural banks, and foreign banks, constituting a minor portion of the Indian banking system, were not considered in the study. Furthermore, the study was conducted only to measure the sustainability of the selected

banks in India. The results cannot be generalised to other regions with different political, environmental, and geographic scenarios. A comparative study among the banks following international reporting standards would be more accurate.

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APPENDIX

Table A.1. Sustainability reporting frameworks, guidelines, and the adherence level of banks

Bank	GRI alignment	CDP participation	DJSI participation	NVGs and GRI G4 alignment
State Bank of India	Fully aligned.	Participates, focusing on carbon footprint and environmental risk. 25,000 tons of CO ₂ emissions in FY 2024.	It is not listed, but it aligns with global sustainability practices.	It aligns with NVGs, covers governance and social responsibility, and partially follows GRI G4 guidelines.
Punjab National Bank	Partial alignment with GRI, especially on social aspects.	Limited participation; environmental disclosures are improving. 14,500 tons of CO ₂ emissions in FY 2024.	It is not listed on DJSI.	Follows NVGs on governance and stakeholder engagement; includes GRI G4 elements.
Bank of Baroda	Partial GRI alignment, especially in environmental and social aspects.	Reports on environmental footprint and energy consumption under CDP. 9,500 tons of CO ₂ emissions in FY 2024.	It is not listed on DJSI.	Adheres to NVGs, including social governance and environmental aspects; partially aligned with GRI G4.
Canara Bank	Complete GRI alignment, particularly in environmental practices.	Limited participation in CDP, focusing on carbon footprint. 6,800 tons of CO ₂ emissions in FY 2024.	It is not listed on DJSI but aligns with global standards.	Follows NVGs, covers corporate governance and environmental sustainability, and aligns with key GRI G4 indicators.
Union Bank of India	Follows GRI guidelines, especially on environmental issues.	Participates in CDP, reporting on energy and emissions. 5,200 tons of CO ₂ emissions in FY 2024.	It is not listed on DJSI.	Adheres to NVGs, covers key governance and stakeholder practices, and partially follows GRI G4 guidelines.
HDFC Bank	Fully adheres to GRI standards and extensive disclosures on ESG topics.	Active CDP participant reports on energy use, emissions, and risks. 36,000 tons of CO ₂ emissions in FY 2024.	Listed on DJSI, reflecting strong global performance.	Strong alignment with NVGs, focusing on ethical business conduct, and fully integrating GRI G4 guidelines.
ICICI Bank	Fully aligned with GRI guidelines.	Active participant, focusing on carbon emissions and energy use. 29,000 tons of CO ₂ emissions in FY 2024.	Listed on DJSI, indicating top-tier sustainability performance.	Strong alignment with NVGs, especially in governance and corporate responsibility; follow GRI G4 for key metrics.
Kotak Mahindra Bank	Follows GRI guidelines with a focus on social responsibility and environmental practices.	There is limited participation, but carbon emissions and energy use are reported.	It is not listed on DJSI.	Aligns with NVGs, focusing on corporate governance and ethical business practices. Partially follows GRI G4.
Axis Bank	Follows GRI guidelines with detailed disclosures.	Actively participates in CDP, reporting on carbon footprint and energy use. 24,000 tons of CO ₂ emissions in FY 2024.	It is not listed on DJSI.	Follows NVGs, especially in environmental sustainability and governance; integrates GRI G4 in reporting.
IndusInd Bank	Partial GRI alignment, especially in social and environmental aspects.	Limited participation in CDP, with a focus on carbon emissions.	It is not listed on DJSI.	Aligns with NVGs, especially in governance and business ethics — partial alignment with GRI G4 in key areas

Source: Authors' analysis based on banks' annual reports.

Table A.2. Details of BRSR, providing insights into their sustainability initiatives and performance (Part 1)

Bank	Environmental indicators	Social indicators	Governance indicators
State Bank of India	<ul style="list-style-type: none"> Carbon emissions: Reported reduction in carbon intensity. Energy consumption: Energy-efficient technologies. Green financing: Focus on financing renewable energy and sustainable projects. 	<ul style="list-style-type: none"> Financial inclusion: Programs like "State Bank of India Gram Seva" target rural empowerment. Diversity and inclusion: Women's empowerment initiatives in banking. Community development: Focus on educational and healthcare initiatives. 	<ul style="list-style-type: none"> Board composition: Diverse with independent directors. Compliance and ethics: High corporate governance standards; anti-money laundering measures in place.
Punjab National Bank	<ul style="list-style-type: none"> Carbon emissions: Undertakes energy audits and reduction measures. Energy consumption: Installation of solar panels in branches. Green financing: Strong portfolio in financing green projects. 	<ul style="list-style-type: none"> Financial inclusion: Promotes small-scale financing to rural businesses. Diversity: Gender-specific policies for recruitment and training. Community development: Focus on women and underprivileged groups through Punjab National Bank's CSR wing. 	<ul style="list-style-type: none"> Board composition: Strong focus on corporate governance with independent directors. Ethics: A zero-tolerance policy on corruption. Compliance: Regular audits and regulatory compliance.

Table A.2. Details of BRSR, providing insights into their sustainability initiatives and performance (Part 2)

<i>Bank</i>	<i>Environmental indicators</i>	<i>Social indicators</i>	<i>Governance indicators</i>
Bank of Baroda	<ul style="list-style-type: none"> Carbon emissions: Reduced emissions via sustainable infrastructure. Energy consumption: Adoption of energy-efficient technologies in operations. Green financing: Providing loans to renewable energy projects. 	<ul style="list-style-type: none"> Financial inclusion: Projects like “Baroda Gramin Vikas Yojna” are aimed at rural economic development. Employee diversity: Gender-sensitive recruitment policies. Community development: Support for education, health, and rural development. 	<ul style="list-style-type: none"> Board composition: Focus on diverse and independent board members. Ethics: Code of conduct for employees and stakeholders. Compliance: Regular risk and compliance assessments.
Canara Bank	<ul style="list-style-type: none"> Carbon emissions: Implementation of energy-efficient measures in operations. Energy consumption: Use of solar energy in select branches. Green financing: Investment in renewable energy initiatives. 	<ul style="list-style-type: none"> Financial inclusion: Branches in remote areas offer low-cost financial products. Employee diversity: Gender inclusivity programs. Community development: Support for education and healthcare projects. 	<ul style="list-style-type: none"> Board composition: Independent directors are committed to ethical governance. Ethics: A Comprehensive ethics program and anti-corruption measures are in place. Compliance: Strong focus on legal and regulatory compliance.
Union Bank of India	<ul style="list-style-type: none"> Carbon emissions: Reduction strategies, including energy-efficient facilities. Energy consumption: Renewable energy is used at major facilities. Green financing: Significant investments in solar and wind energy. 	<ul style="list-style-type: none"> Financial inclusion: Focus on financial products for marginalised groups. Diversity: Policies aimed at increasing female representation. Community development: <ul style="list-style-type: none"> Health, education, and environmental sustainability initiatives. 	<ul style="list-style-type: none"> Board composition: Diverse with a focus on governance best practices. Ethics: Transparent reporting and anti-money laundering efforts. Compliance: Strong risk management framework.
HDFC Bank	<ul style="list-style-type: none"> Carbon emissions: Reported emissions reduction of over 10% in the past five years. Energy consumption: High adoption of renewable energy. Green financing: Significant investment in green bonds and renewable energy projects. 	<ul style="list-style-type: none"> Financial inclusion: Digital banking initiatives to reach underserved populations. Diversity: Women empowerment programs, employee training. Community development: Focus on education, skill development, and healthcare. 	<ul style="list-style-type: none"> Board composition: Strong governance with independent board members. Ethics: High standards of ethical conduct. Compliance: Regulatory adherence and strong internal audit processes.
ICICI Bank	<ul style="list-style-type: none"> Carbon emissions: Strong focus on reducing operational emissions. Energy consumption: Green building certifications for significant branches. Green financing: Loans for solar energy projects and energy-efficient buildings. 	<ul style="list-style-type: none"> Financial inclusion: Microfinance programs for low-income families. Diversity: Promotes women in leadership roles — community Development: Healthcare, education, and skill development initiatives. 	<ul style="list-style-type: none"> Board composition: Diverse leadership with a focus on ethics. Ethics: Anti-corruption policies, commitment to transparency. Compliance: Strong compliance with legal and regulatory frameworks.
Kotak Mahindra Bank	<ul style="list-style-type: none"> Carbon emissions: Commitment to reducing carbon footprint. Energy consumption: Use of renewable energy sources in branches. Green financing: Financing for renewable energy and low-carbon infrastructure. 	<ul style="list-style-type: none"> Financial inclusion: Digital banking for rural and low-income groups. Diversity: Gender diversity in senior leadership roles. Community development: Focus on women’s empowerment, education, and health initiatives. 	<ul style="list-style-type: none"> Board composition: High corporate governance standards, diverse board. Ethics: Strong ethics code and compliance policies. Compliance: Focus on risk management and regulatory adherence.
AXIS Bank	<ul style="list-style-type: none"> Carbon emissions: Reduced emissions through energy-saving technologies. Energy consumption: Transitioning to green energy. Green financing: Investments in solar and wind energy projects. 	<ul style="list-style-type: none"> Financial inclusion: Branch network in underserved areas. Employee diversity: Focus on increasing the number of women in banking. Community development: Initiatives in rural development, education, and healthcare. 	<ul style="list-style-type: none"> Board composition: Gender-balanced board with independent directors. Ethics: Strict ethical guidelines, corporate governance. Compliance: Strong regulatory compliance and risk management frameworks.
IndusInd Bank	<ul style="list-style-type: none"> Carbon emissions: Strategies in place for reducing operational carbon footprint. Energy consumption: Increased reliance on solar power and energy-saving initiatives. Green financing: Loans for renewable energy projects. 	<ul style="list-style-type: none"> Financial inclusion: Products targeting underserved markets. Diversity: Programs supporting gender diversity and inclusion. Community development: Support for health, education, and rural development. 	<ul style="list-style-type: none"> Board composition: Diverse, with independent directors. Ethics: Transparent corporate governance policies. Compliance: Strong risk management and compliance structure.

Source: Authors’ analysis based on banks’ annual reports.

Table A.3. The growing trend in ESG reporting, the varied adoption levels among the banks, and the engagement of stakeholders in determining ESG priorities

<i>Bank</i>	<i>ESG reporting</i>	<i>Adoption levels</i>	<i>Stakeholder engagement in ESG priorities</i>	<i>Key findings</i>
State Bank of India	State Bank of India has shown significant growth in ESG reporting, aligning with global standards. Focus on environmental sustainability, social inclusion, and governance practices.	High: The bank has integrated ESG into its corporate governance, risk management, and business strategies.	State Bank of India engages with stakeholders, including investors, customers, and regulators, to establish ESG priorities. They focus on sustainable finance and social responsibility.	Strong CSR focus needs better environmental disclosures and more focus on climate-related risks.
Punjab National Bank	Punjab National Bank has recently gradually enhanced its ESG disclosures, with an increasing focus on environmental impact and social equity.	Medium: Punjab National Bank progressively integrates ESG factors, but its adoption is slower than that of larger private banks.	Stakeholder engagement includes consultation with investors and communities to address social and environmental concerns, though their process is still maturing.	Requires improved environmental disclosures and global sustainability participation.
Bank of Baroda	Bank of Baroda has been reporting on ESG parameters, focusing on green finance and governance initiatives.	Medium: Adoption is evident, but there is room for improvement in social and governance reporting.	They engage with institutional and retail investors to set ESG goals, focusing on developing sustainable finance solutions. Stakeholder feedback helps guide their ESG agenda.	It needs improved environmental performance and better alignment with global sustainability benchmarks.
Canara Bank	Canara Bank increasingly focuses on ESG, emphasising environmental sustainability and ethical governance.	Medium: They are adopting ESG frameworks, but their integration into operations is evolving.	Engagement with stakeholders includes aligning ESG priorities with national development goals. Their approach is stakeholder-inclusive, but requires more depth in social and environmental strategies.	Strong focus on green finance, but needs further global recognition and comprehensive environmental data.
Union Bank of India	Union Bank of India has made strides in ESG reporting, particularly in corporate governance and environmental policies.	Medium: Adoption of ESG practices is evident, but implementation varies across different departments.	Their stakeholder engagement includes discussions with investors and the local community to develop impactful social programs. However, their reporting is still in the early stages of full implementation.	Needs more detailed environmental disclosures and greater global competitiveness.
HDFC Bank	HDFC Bank has led ESG reporting, showcasing advanced integration of ESG factors into its business strategies and operations.	High: Strong adoption across ESG domains.	Extensive stakeholder engagement, including investors, customers, and NGOs, helps set ESG priorities. The bank integrates feedback from all stakeholder groups into its decision-making.	The industry leader in sustainability, with strong environmental and social governance performance.
ICICI Bank	ICICI Bank increasingly prioritises ESG, focusing on environmental sustainability and financial inclusion.	High: ICICI Bank has one of the private banks' most mature ESG reporting systems.	The bank engages actively with institutional investors and customers to define ESG priorities, with a clear focus on social impact and climate change.	Recognised in DJSI, it maintains strong global performance and needs more ambitious environmental targets.
Kotak Mahindra Bank	Kotak Mahindra Bank has adopted an evolving approach to ESG, focusing on ethical governance, social responsibility, and environmental risk.	Medium: Adoption is growing, though social and governance aspects are still developing.	The bank consults with stakeholders, particularly institutional investors, to decide on ESG priorities. Their efforts are in line with global sustainability goals.	Environmental and climate-related disclosures need improvement, with more focus on global sustainability benchmarks.
AXIS Bank	Axis Bank has shown substantial progress in ESG reporting, particularly in environmental conservation, clean energy, and sustainable finance.	High: The bank has fully integrated ESG considerations into its strategy and operations.	Axis Bank engages deeply with investors and environmental groups to prioritise climate action and social responsibility, reflecting a strong commitment to stakeholder-driven ESG priorities.	Strong CSR efforts require more ambitious environmental goals to improve global sustainability rankings.
IndusInd Bank	IndusInd Bank is actively enhancing its ESG reporting, emphasising governance, ethical business practices, and social development.	Medium: While their ESG adoption is improving, the bank is still in the process of full integration.	Engagement primarily includes investors and communities. Their strategy is evolving to align better with sustainable finance and community development goals.	Needs more integration of sustainability practices, especially in environmental and climate-related disclosures.

Source: Authors' analysis based on banks' annual reports.