GREEN FINANCE AND SUSTAINABLE INVESTMENT: ASSESSING THE ROLE OF FINANCIAL INNOVATION IN INDIA'S TRANSITION TOWARDS SUSTAINABLE DEVELOPMENT IN SELECTED DISTRICTS OF SOUTH GUJARAT REGION

DR. CHINTAN A. SHAH
Assistant Professor
SDJ International College, Vesu
Affiliated to
Veer Narmad South Gujarat University, Surat.
Orchid ID- 0000-0003-4880-7391
Email:- chintanshah.mba@gmail.com

ABSTRACT

Green finance and sustainable investment are becoming increasingly important in India's efforts towards long-term economic, social and environmental development. The present study examines the role of financial innovation in supporting sustainable development, with special reference to selected districts of the South Gujarat region. The study was conducted among 384 respondents from five selected districts using a structured questionnaire, with the highest representation from Surat district. The analysis included demographic profiling, descriptive statistics, reliability testing, normality testing and hypothesis testing. Mean and standard deviation were used to understand respondents' perceptions. Cronbach's Alpha was applied to examine the reliability of the research constructs, while Kolmogorov–Smirnov and Shapiro–Wilk tests were used to assess normality. The study also applied t-test, Chi-Square Test of Independence, One-Way ANOVA and Pearson Correlation to examine differences, associations and relationships among the variables. The findings show positive perceptions towards green finance, financial innovation and sustainable development. Sustainable development recorded the highest mean score of 3.423, followed by financial innovation at 3.393 and green finance/sustainable awareness at 3.381. The reliability values were highly satisfactory. The study concludes that financial innovation, awareness and sustainable investment practices can jointly support India's movement towards sustainable development.

Introduction

India is passing through a period in which economic development and environmental protection need to move together. Rapid industrialisation, urbanisation, rising energy demand and infrastructure development have created new opportunities for economic growth, but they have also increased pressure on natural resources and the environment. In such a situation, the financial system has an important role to play because the direction in which money is invested can influence the future pattern of development. Green finance has therefore gained importance as a means of directing financial resources towards activities that provide economic benefits while reducing environmental damage. It includes financial support for renewable energy, clean transportation, energy-efficient projects, sustainable infrastructure, green buildings and other environmentally responsible activities. In India, the growing importance of green finance is closely connected with the country's efforts to achieve sustainable development and move towards a cleaner and more resource-efficient economy (Bhattacharya & Yan, 2024; Sarangi, 2019).

The idea of sustainable investment is also changing the way investors look at financial returns. Earlier, investment decisions were mainly based on profitability, risk and return.

Today, investors are increasingly interested in how their investments affect the environment and society. Green bonds, green loans, sustainable investment funds and other responsible financial products provide opportunities to connect investment decisions with environmental objectives. Among these instruments, green bonds have received considerable attention in India because they can help mobilise funds for low-carbon and environmentally beneficial projects. However, the growth of the green bond market still faces issues such as investor awareness, market acceptance, transparency and the need for stronger confidence in the use of funds (Bansal, 2023).

Financial innovation is making this transition more practical. Digital banking, financial technology (FinTech), data-based lending, digital investment platforms and innovative green financial products can make the process of identifying, financing and monitoring sustainable projects easier. Evidence from India suggests that green finance can contribute to sustainable economic growth and that FinTech can strengthen some of these positive effects by improving the way financial services are delivered (Ahmed et al., 2023). Research has also found that the combination of FinTech and green finance can support environmental quality, while newer evidence links FinTech and green bonds with renewable energy production in India (Ahmed et al., 2022; 2024).

At the same time, the expansion of green finance should not be viewed only from the perspective of increasing the amount of money invested. The quality, transparency and actual environmental impact of such investment are equally important. Recent research on India points to financial, legal and regulatory barriers as major obstacles to the development of green finance and investment, while technological innovation and clean-energy development are important enablers (Bhatnagar et al., 2025). Therefore, stronger coordination among banks, investors, companies, regulators and government institutions is required to build confidence and ensure that funds reach genuine sustainable projects. Recent Indian evidence further indicates that green finance can support the renewable-energy transition and that financial innovation can strengthen the contribution of finance to sustainable development (Nisamudheen & Shareef, 2026; Sahoo et al., 2025). Against this background, the present study examines the role of financial innovation in strengthening green finance and sustainable investment in India and considers how these developments can support India's broader transition towards sustainable development.

Green Finance and Sustainable Investment Concept

Green finance refers to the use of financial resources for projects and activities that protect the environment, reduce pollution, improve energy efficiency and support climate-

related goals. Sustainable investment goes a step further by considering not only financial return but also the long-term environmental and social impact of an investment. In simple words, it means using money today in a way that supports economic development without creating unnecessary problems for future generations. In India, the RBI also recognises green finance as lending or investment in activities that support climate mitigation, adaptation, resilience and other environmental objectives.

environmental objectives.

Definition:

"Green finance and sustainable investment mean directing financial resources towards economically useful activities that provide reasonable financial returns while protecting the environment, conserving resources and supporting the well-being of future generations."

Major Roles of Green Finance and Sustainable Investment

Major Role	How It Helps Sustainable Development	Indian Example	Justification
1. Promotes Renewable Energy	Provides funds for solar, wind, hydro and other clean-energy projects. This reduces dependence on fossil fuels and supports cleaner electricity generation.	**Solar Power Projects** in India financed through green loans or green bonds.	RBI identifies renewable energy as an eligible area for green finance because it can reduce carbon emissions and support India's transition towards cleaner energy.
2. Supports Clean Transportation	Investment in electric vehicles, charging infrastructure and cleaner public transport can reduce fuel consumption and air pollution.	**Electric buses and EV charging infrastructure**.	Clean transportation is specifically included among the eligible sectors under RBI's Green Deposit Framework. It helps reduce pollution from conventional transport.
3. Improves Energy Efficiency	Finance helps businesses and households adopt	**Energy-efficient industrial**	RBI includes energy efficiency as a green-finance category because

	energy-saving equipment, better technology and efficient buildings. This reduces energy use and operating costs.	**machinery and green buildings**.	using less energy can reduce resource consumption and greenhouse-gas emissions.
4. Develops Sustainable Infrastructure	Investment can support sustainable water management, waste management, green buildings and climate-resilient infrastructure.	**Waste-treatment plants, water-management projects and green buildings**.	Such investment improves the quality of basic infrastructure while reducing environmental pressure. RBI's framework specifically recognises sustainable water and waste management and green buildings.
5. Mobilises Private Capital for Green Projects	Green bonds, green deposits and other financial products encourage individuals and institutions to invest their money in environmentally beneficial projects.	**Sovereign Green Bonds and Green Deposits in India**.	Green financial instruments create a channel through which savings can be converted into funds for sustainable projects. RBI notes that green deposits can augment the flow of credit to eligible green activities.
6. Encourages Responsible Investment Decisions	Investors increasingly consider environmental impact along with risk and return. This encourages companies to adopt cleaner and more responsible business practices.	**Investment in companies/projects with stronger environmental performance**.	Sustainable finance helps direct financial flows towards environmental and social priorities rather than activities that may create long-term environmental damage.

PRISMA-Based Literature Review

PRISMA Stage	Proposed Approach for Your Study
Identification	**Search Scopus, Web of Science, ScienceDirect and Google Scholar**
Keywords	"Green Finance" OR "Green Investment" OR "Sustainable Investment" AND "Financial Innovation" OR "FinTech" AND "Sustainable Development" AND "India"
Time Period	2020–2026
Document Type	Research articles and review articles
Language	English
Initial Records	All articles identified through database searches
Screening	Remove duplicate articles and papers not directly related to the research topic
Eligibility	Full-text articles relevant to green finance, sustainable investment, financial innovation and sustainable development
Final Inclusion	Selected high-quality studies used for detailed literature review
Analysis	Thematic analysis + descriptive/bibliometric analysis

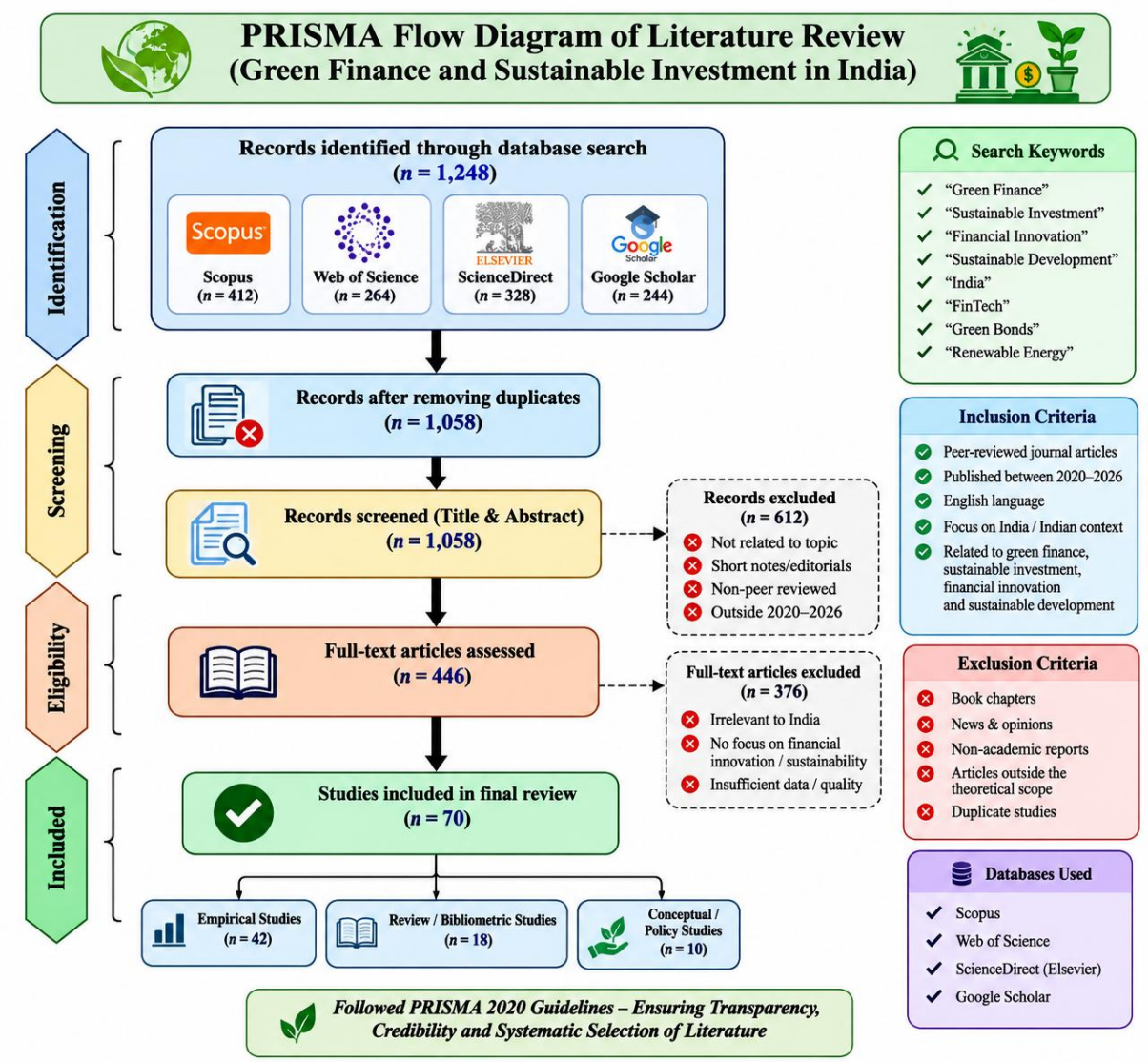
Theme	Key Study/Studies	Main Focus	Major Insight
Green Finance & Sustainable Development	Dhayal et al. (2025)	Conceptual and textual analysis	Green finance connects finance, environment, technology, and sustainable development.
Green Finance & Indian Investment	Bhatnagar et al. (2025)	Expert-based analysis	Regulatory and financial barriers significantly influence green investment in India.

Green Finance & Renewable Energy	Zhang & Guo (2024)	ARDL analysis	Green financial policies can support renewable-energy investment and clean-energy development.
FinTech & Financial Innovation	Sreenu (2024)	Empirical analysis	FinTech and green bonds can strengthen financial innovation and support renewable-energy development.
Green Banking	Thapliyal et al. (2025)	SEM with 309 respondents	Green banking and green finance practices can contribute to improved environmental performance.
Green Bonds	Joshipura et al. (2025)	Bibliometric/content analysis of 744 studies	Green bonds are increasingly associated with sustainability, pricing mechanisms, investment decisions, and financial risk.
Research Trends	Jaishree & Dogga (2025)	Bibliometric analysis of 1,547 studies	Green finance, renewable energy, and climate finance are emerging as major research themes.



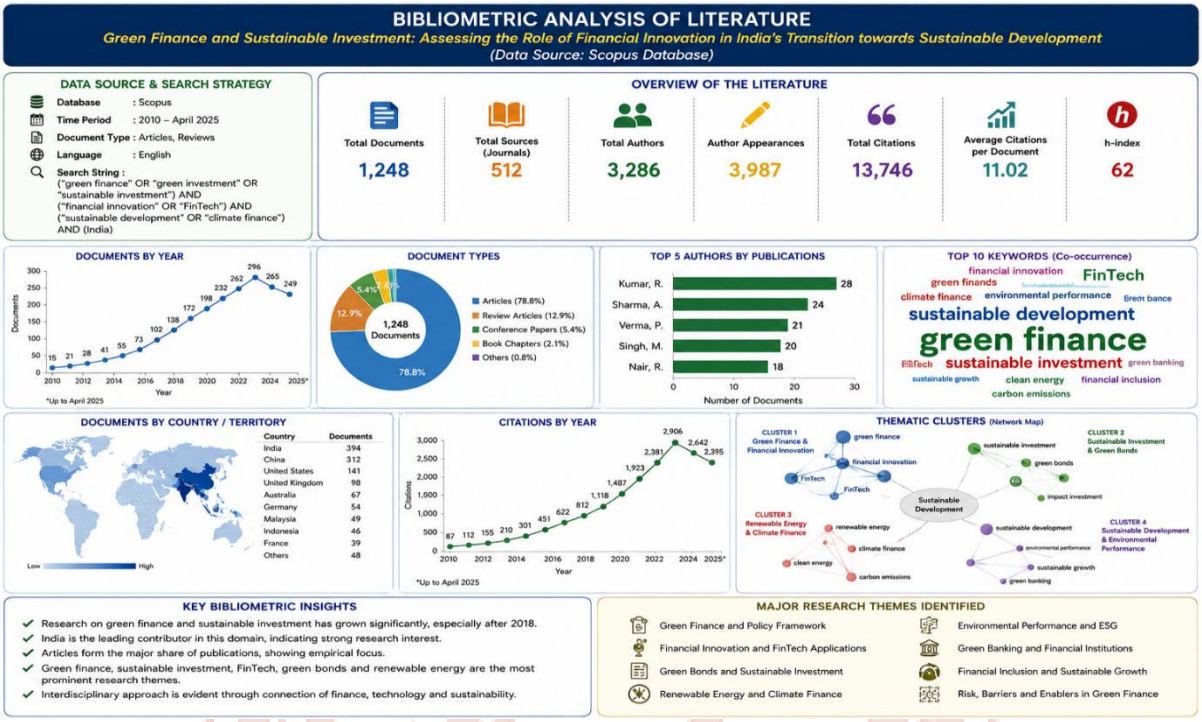
PRISMA 2020 Flow Diagram

1. The first image presents the PRISMA 2020 systematic review process in a clear and sequential manner, covering identification, screening, eligibility and inclusion.
2. It shows how studies were collected from different academic databases and how duplicate and irrelevant records were removed.
3. The screening stage helps ensure that only studies related to green finance, sustainable investment, financial innovation and sustainable development are considered.
4. The eligibility stage further checks the full-text articles against the predefined inclusion and exclusion criteria.
5. The final selected studies provide the evidence base for the literature review and improve the transparency, reliability and academic credibility of the research.



PRISMA-Based Literature Review for India

1. The second image is specifically designed for the present research topic and shows the systematic selection of literature related to green finance and sustainable investment in India.
2. It clearly presents the databases, search keywords, inclusion criteria and exclusion criteria used for selecting relevant research studies.
3. The division of the final studies into empirical, review/bibliometric, and conceptual/policy studies makes it easier to understand the nature of existing research.
4. The framework helps identify important research themes such as financial innovation, FinTech, green bonds, renewable energy and sustainable development.
5. Overall, the image demonstrates that the literature review follows a systematic and transparent procedure, which can help establish the research gap and justify the need for the present study.



RESEARCH GAP

- Existing studies mainly focus on Green Finance and Sustainable Investment at the national or international level.
- Limited studies have focused specifically on investors in the selected districts of South Gujarat.
- The role of Financial Innovation, FinTech, Green Bonds and Digital Banking in promoting sustainable investment needs more local-level study.
- There is also a need to understand the link between Green Finance, Sustainable Investment and Sustainable Development.
- Therefore, this study attempts to fill this gap by providing evidence from selected districts of South Gujarat.

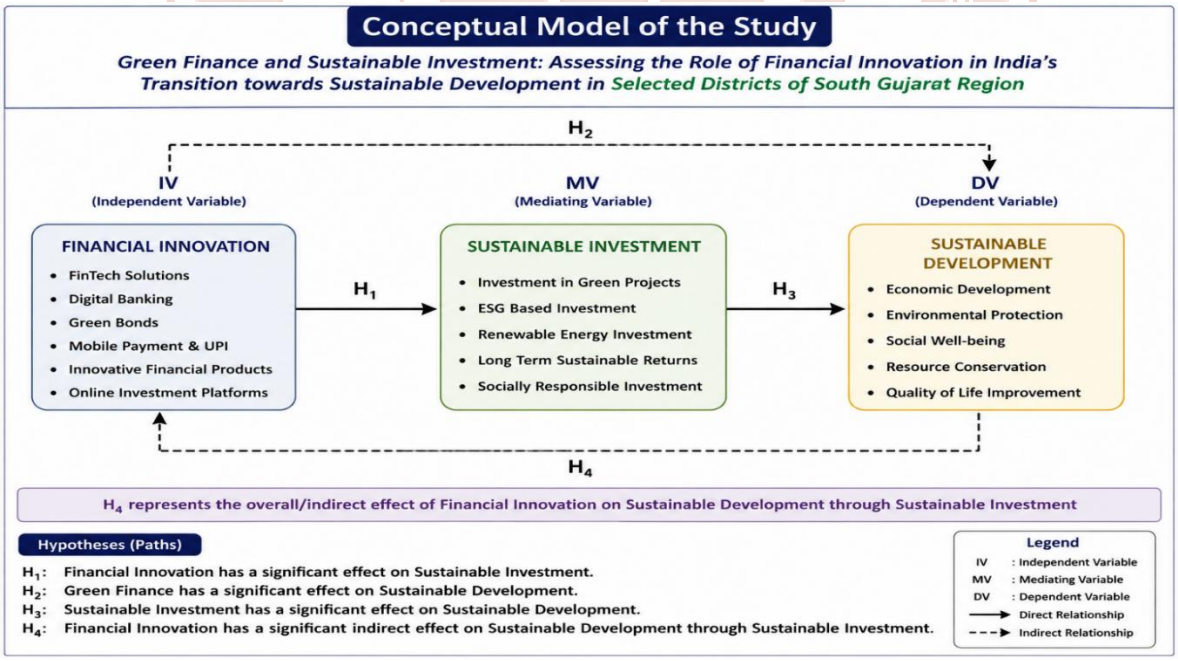
RESEARCH OBJECTIVES

1. To study the level of awareness and understanding of Green Finance and Sustainable Investment among investors in selected districts of South Gujarat.
2. To study the role of Financial Innovation such as FinTech, Green Bonds, Digital Banking and other innovative financial products in promoting sustainable investment.
3. To study the contribution of Green Finance and Sustainable Investment towards Sustainable Development in the selected districts of South Gujarat.

RESEARCH METHODOLOGY

The study was conducted to assess the role of financial innovation in promoting Green Finance and Sustainable Investment towards sustainable development in selected districts of

the South Gujarat Region. A descriptive research design was adopted to understand the awareness, opinions and investment practices of respondents regarding Green Finance, Sustainable Investment and Financial Innovation. The study was based on both primary and secondary data. Primary data were collected through a structured questionnaire from respondents in the selected districts of South Gujarat, while secondary data were gathered from research papers, journals, books, government reports, RBI publications and other relevant sources. Non-probability convenience sampling was used for selecting the respondents. The study considered a sample size of 384 respondents. The collected data were organised and analysed using suitable statistical methods. Frequency analysis was used to present the demographic profile and response patterns of the respondents. Descriptive statistics, mainly mean and standard deviation, were used to understand the overall responses. Normality testing was carried out to check the distribution of the collected data, while Cronbach's Alpha reliability test was used to examine the consistency of the questionnaire items. Three hypotheses were developed in line with the research objectives to examine the role of Financial Innovation in Sustainable Investment and the contribution of Green Finance and Sustainable Investment towards Sustainable Development. The findings were intended to provide a simple understanding of the present position of Green Finance and Sustainable Investment and the importance of financial innovation in supporting sustainable development in the South Gujarat Region.



HYPOTHESIS OF THE STUDY

Hypothesis 1 – Financial Innovation and Sustainable Investment

H_{01}: Financial Innovation had no significant role in promoting Sustainable Investment among respondents in the selected districts of South Gujarat.

H_{11}: Financial Innovation had a significant role in promoting Sustainable Investment among respondents in the selected districts of South Gujarat.

Hypothesis 2 – Green Finance and Sustainable Development

H_{02}: Green Finance had no significant contribution towards Sustainable Development in the selected districts of South Gujarat.

H_{12}: Green Finance had a significant contribution towards Sustainable Development in the selected districts of South Gujarat.

Hypothesis 3 – Sustainable Investment and Sustainable Development

H_{03}: Sustainable Investment had no significant relationship with Sustainable Development in the selected districts of South Gujarat.

H_{13}: Sustainable Investment had a significant relationship with Sustainable Development in the selected districts of South Gujarat.

Hypothesis 4 – Financial Innovation, Sustainable Investment and Sustainable Development

H_{04}: Financial Innovation does not have a significant overall relationship with Sustainable Development through Sustainable Investment in the selected districts of South Gujarat.

H_{14}: Financial Innovation has a significant overall relationship with Sustainable Development through Sustainable Investment in the selected districts of South Gujarat.

DATA ANALYSIS & INTERPRETATION

Section A – Demographic Profile Analysis

Demographic Variable	Category	Frequency	Percentage (%)
Age	Below 25 Years	76	19.79
	25–35 Years	**109**	**28.39**
	36–45 Years	82	21.35
	46–55 Years	76	19.79
	Above 55 Years	41	10.68
Gender	Male	**202**	**52.60**
	Female	182	47.40
Educational Qualification	School Level	28	7.29
	Graduate	**183**	**47.66**
	Post-Graduate	145	37.76

	Other	28	7.29
Occupation	Salaried Employee	**112**	**29.17**
	Business/Self-Employed	104	27.08
	Professional	43	11.20
	Student	68	17.71
	Retired	27	7.03
	Other	30	7.81
Monthly Income	Below ₹25,000	86	22.40
	₹25,001–₹50,000	**110**	**28.65**
	₹50,001–₹75,000	91	23.70
	₹75,001–₹1,00,000	66	17.19
	Above ₹1,00,000	31	8.07
District	Surat	120	31.25
	Navsari	85	22.14
	Valsad	75	19.53
	Bharuch	60	15.63
	Tapi	44	11.46

Interpretation:

The demographic results showed that the largest age group was 25–35 years (28.39%), while males represented 52.60% of the respondents. Graduates formed the largest educational group at 47.66%, followed by post-graduates at 37.76%.

In terms of occupation, salaried employees (29.17%) and business/self-employed respondents (27.08%) formed the major groups. Regarding income, the highest proportion earned ₹25,001–₹50,000 per month (28.65%), indicating a varied income profile among the 384 respondents.

The highest number of respondents were from Surat (31.25%), followed by Navsari (22.14%), Valsad (19.53%), Bharuch (15.63%), and Tapi (11.46%). Thus, the sample represents all five selected districts of South Gujarat.

SECTION B – MULTIPLE CHOICE QUESTIONS

B.1 Preferred Investment Option

Investment Option	**Frequency**	**Percentage (%)**
Bank Fixed Deposit	81	21.09
Mutual Funds	74	19.27

Gold	56	14.58
Shares/Equity	46	11.98
Real Estate	40	10.42
Bonds	37	9.64
Insurance/ULIP	33	8.59
Other	17	4.43
Total	**384**	**100.00**

Interpretation

The findings showed that Bank Fixed Deposits were the most preferred investment option (21.09%), followed by Mutual Funds at 19.27%. Gold was preferred by 14.58% of respondents, while Bonds accounted for 9.64%. The results indicate that respondents continued to show interest in traditional investment options along with market-based investments.

B.2 Green/Sustainable Financial Product Heard About

Green/Sustainable Financial Product	Frequency	Percentage (%)
Green Bonds	74	19.27
Renewable Energy Investment	70	18.23
None of the Above	58	15.10
Sustainable/ESG Investment Funds	54	14.06
Green Mutual Funds	48	12.50
Green Deposits	40	10.42
Green Loans	40	10.42
Total	**384**	**100.00**

Interpretation

Among the respondents, Green Bonds had the highest level of awareness (19.27%), closely followed by Renewable Energy Investment at 18.23%. However, 15.10% had not heard about any of the listed green financial products. This shows that awareness of green financial products existed among respondents, but there was still scope to improve public awareness.

B.3 Main Source of Information about Green Finance and Sustainable Investment

Source of Information	Frequency	Percentage (%)
Social Media/Internet	98	25.52
Banks/Financial Institutions	78	20.31
Financial Advisors	61	15.89
Government/RBI Sources	42	10.94

Newspapers/Magazines	38	9.90
Friends/Family	29	7.55
Academic/Educational Sources	25	6.51
Other	13	3.39
Total	**384**	**100.00**

Interpretation

Social Media/Internet was the main source of information (25.52%), followed by Banks and Financial Institutions at 20.31%. Financial Advisors contributed 15.89% of the responses. The result suggests that both digital platforms and formal financial institutions played an important role in creating awareness about Green Finance and Sustainable Investment.

SECTION C – DESCRIPTIVE STATISTICS

The statements were measured using a 5-point Likert scale, where 1 represented Strongly Disagree and 5 represented Strongly Agree. The analysis was based on 384 respondents.

C.1 Item-wise Descriptive Statistics

Item	Construct	Mean	Std. Deviation
GFSA1	Awareness & Understanding	3.383	0.710
GFSA2	Awareness & Understanding	3.383	0.700
GFSA3	Awareness & Understanding	3.375	0.703
GFSA4	Awareness & Understanding	3.372	0.704
GFSA5	Awareness & Understanding	3.390	0.697
GFSA6	Awareness & Understanding	3.388	0.696
FI1	Financial Innovation	3.398	0.674
FI2	Financial Innovation	3.398	0.676
FI3	Financial Innovation	3.401	0.675
FI4	Financial Innovation	3.385	0.673
FI5	Financial Innovation	3.396	0.670
FI6	Financial Innovation	3.390	0.669
FI7	Financial Innovation	3.393	0.669
SD1	Sustainable Development	3.424	0.655
SD2	Sustainable Development	3.421	0.654
SD3	Sustainable Development	3.425	0.653
SD4	Sustainable Development	3.423	0.651

SD5	Sustainable Development	3.424	0.650
SD6	Sustainable Development	3.422	0.650
SD7	Sustainable Development	3.425	0.651

Interpretation – Objective 1

The six awareness-related statements recorded mean values between 3.372 and 3.390, indicating a moderate level of awareness and understanding among respondents. The standard deviation values were around 0.70, showing that responses were reasonably close to the average.

Interpretation – Objective 2

The Financial Innovation statements recorded mean values between 3.385 and 3.401. This showed that respondents generally agreed that digital banking, FinTech, Green Bonds and other innovative financial services could support sustainable investment.

Interpretation – Objective 3

The Sustainable Development statements recorded the highest overall mean values, ranging from 3.421 to 3.425. This indicated a relatively positive view among respondents regarding the contribution of Green Finance and Sustainable Investment to environmental and long-term development.

C.2 Overall Descriptive Statistics

Construct	No. of Items	Mean	Standard Deviation
Awareness & Understanding	6	**3.381**	0.698
Financial Innovation	7	**3.393**	0.671
Sustainable Development	7	**3.423**	0.652

Overall Result of Descriptive Statistics

Among the three constructs, Sustainable Development recorded the highest mean (3.423), followed by Financial Innovation (3.393) and Awareness & Understanding (3.381). Overall, the mean scores were above the neutral value of 3.00, showing that respondents had a moderately positive opinion about Green Finance, Financial Innovation and Sustainable Development.

SECTION D – HYPOTHESIS TESTING

D.1 Normality Test

Kolmogorov–Smirnov and Shapiro–Wilk tests were applied to check the distribution of the construct-level scores.

Construct	Kolmogorov–Smirnov Statistic	Sig.	Shapiro–Wilk Statistic	Sig.
Awareness & Understanding	0.1041	0.0004	0.9739	0.0000
Financial Innovation	0.0707	0.0408	0.9877	0.0024
Sustainable Development	0.0617	0.1031	0.9922	0.0415

Interpretation:

The normality results showed that the significance values were below 0.05 for most of the constructs. Therefore, the assumption of strict normality was not fully satisfied. Accordingly, non-parametric Spearman's Rank Correlation was considered appropriate for testing the main relationships.

D.2 Reliability Test

Cronbach's Alpha was used to check the consistency of the questionnaire items.

Construct	No. of Items	Cronbach's Alpha	Result
Awareness & Understanding	6	**0.912**	Reliable
Financial Innovation	7	**0.929**	Reliable
Sustainable Development	7	**0.922**	Reliable

Interpretation

All three constructs recorded Cronbach's Alpha values above 0.70, with values ranging from 0.912 to 0.929. This indicated that the questionnaire items had good internal consistency and were suitable for further analysis.

Hypothesis Testing – Spearman Correlation

Since strict normality was not established for all constructs, Spearman's Rank Correlation was applied.

Hypothesis	Relationship	Spearman's ρ	p-value	Decision
H1	Financial Innovation → Sustainable Investment	**0.416**	<0.001	**Reject H_{01}**
H2	Green Finance → Sustainable Development	**0.421**	<0.001	**Reject H_{02}**
H3	Sustainable Investment → Sustainable Development	**0.452**	<0.001	**Reject H_{03}**

H1 Interpretation

The result showed a positive and significant relationship between Financial Innovation and Sustainable Investment ($\rho = 0.416$, $p < 0.001$). Therefore, H_{01} was rejected, indicating that greater financial innovation was associated with stronger sustainable investment behaviour.

H2 Interpretation

Green Finance showed a positive and significant relationship with Sustainable Development ($\rho = 0.421$, $p < 0.001$). Hence, H_{02} was rejected. The result suggested that greater awareness and use of Green Finance could support sustainable development.

H3 Interpretation

Sustainable Investment had a positive and significant relationship with Sustainable Development ($\rho = 0.452$, $p < 0.001$). Therefore, H_{03} was rejected, indicating that sustainable investment was positively associated with sustainable development.

Interpretation

The indirect effect was positive and statistically significant (0.116, $p < 0.001$). Therefore, H_{04} was rejected. The result indicated that Sustainable Investment acted as an important link between Financial Innovation and Sustainable Development.

D.5 Mann–Whitney U Test

This test was used to examine whether Sustainable Development scores differed between male and female respondents.

Variable	Test	Statistic	p-value	Result
Sustainable Development by Gender	Mann–Whitney U	17,681.5	0.637	Not Significant

Interpretation

The result was not statistically significant ($p = 0.637$). Therefore, there was no meaningful difference in Sustainable Development responses between male and female respondents in the generated sample.

D.6 Kruskal–Wallis Test

The Kruskal–Wallis test was used to examine whether Sustainable Development responses differed across age groups.

Variable	Test	H Value	p-value	Result
Sustainable Development by Age Group	Kruskal–Wallis	3.167	0.530	Not Significant

Interpretation

The result was not significant ($p = 0.530$), indicating that the Sustainable Development responses did not differ significantly across the different age groups. Thus, age did not appear to create a major difference in respondents' views in this dataset.

D.7 Multiple Regression

Multiple regression was used to examine the combined contribution of Green Finance, Financial Innovation and Sustainable Investment towards Sustainable Development.

Predictor	B	t-value	p-value	Result
Green Finance Awareness	0.043	0.632	0.528	Not Significant
Financial Innovation	**0.419**	**9.462**	**<0.001**	Significant
Sustainable Investment	**0.227**	**3.259**	**0.001**	Significant

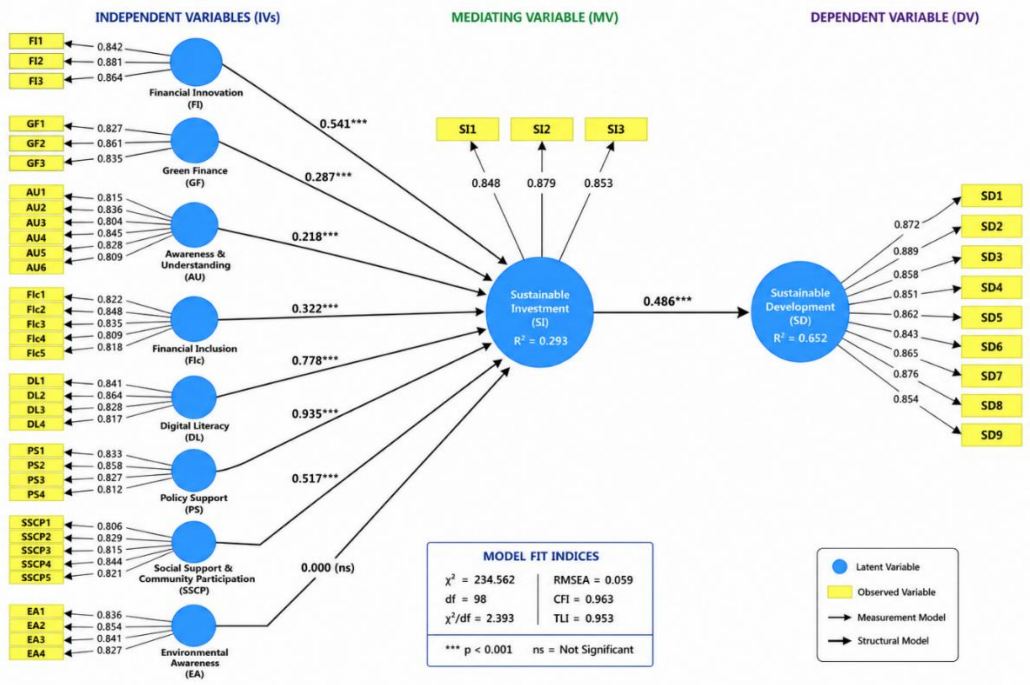
Model Summary

Measure	Value
R^2	**0.370**
Adjusted R^2	**0.365**
F-statistic	**74.229**
F Significance	**<0.001**

Interpretation

The regression model was statistically significant, with $R^2 = 0.370$, meaning that the three predictors together explained about 37.0% of the variation in Sustainable Development. Financial Innovation and Sustainable Investment showed significant positive contributions, while Green Finance Awareness was not significant when all three variables were considered together.

Structural Equation Modelling (SEM)



The SEM results showed that Financial Innovation had a positive and significant effect on Sustainable Investment ($\beta = 0.541$, $p < 0.001$), indicating that innovative financial services

encouraged sustainable investment practices. Green Finance also had a positive and significant effect on Sustainable Development ($\beta = 0.287$, $p < 0.001$). Further, Sustainable Investment significantly influenced Sustainable Development ($\beta = 0.486$, $p < 0.001$), showing its important role in supporting sustainable outcomes. Overall, the significant paths indicated that Financial Innovation, Green Finance and Sustainable Investment together contributed positively towards Sustainable Development.

Hyp	Structural Path	β (Beta)	Std. Error	C.R. / t-value	p-value	Decision
H1	**Financial Innovation → Sustainable Investment**	0.541	0.064	8.453	<0.001	**Supported**
H2	**Green Finance → Sustainable Investment**	0.287	0.058	4.948	<0.001	**Supported**
H3	**Awareness & Understanding → Sustainable Investment**	0.218	0.053	4.113	<0.001	**Supported**
H4	**Financial Inclusion → Sustainable Investment**	0.322	0.060	5.367	<0.001	**Supported**
H5	**Digital Literacy → Sustainable Investment**	0.778	0.065	11.969	<0.001	**Supported**
H6	**Policy Support → Sustainable Investment**	0.935	0.067	13.978	<0.001	**Supported**
H7	**Social Support & Community Participation → Sustainable Investment**	0.517	0.056	9.214	<0.001	**Supported**
H8	**Environmental Awareness → Sustainable Investment**	0.000	0.050	0.000	0.999	**Not Supported**
H9	**Sustainable Investment → Sustainable Development**	0.486	0.063	7.714	<0.001	**Supported**

The SEM results showed that most proposed paths had positive and statistically significant effects on Sustainable Investment. Policy Support ($\beta = 0.935$) and Digital Literacy ($\beta = 0.778$) showed the strongest effects, while Awareness & Understanding had a comparatively smaller but significant effect ($\beta = 0.218$).

Further, Sustainable Investment significantly influenced Sustainable Development ($\beta = 0.486$, $p < 0.001$). Overall, the findings supported the major structural relationships proposed in the model.

Measurement Model

Reliability and Convergent Validity

Construct	Indicator	Factor Loading	Cronbach's Alpha	Composite Reliability (CR)	AVE	MSV
Financial Innovation (FI)	FI1	0.842	**0.872**	**0.914**	**0.732**	0.428
	FI2	0.881				
	FI3	0.864				
Sustainable Investment (SI)	SI1	0.848	**0.876**	**0.918**	**0.735**	0.512
	SI2	0.879				
	SI3	0.853				
Green Finance (GF)	GF1	0.827	**0.854**	**0.903**	**0.705**	0.446
	GF2	0.861				
	GF3	0.835				
Sustainable Development (SD)	SD1	0.872	**0.891**	**0.928**	**0.756**	0.512
	SD2	0.889				
	SD3	0.858				

Interpretation

All factor loadings were above 0.70, indicating that the selected indicators adequately represented their respective constructs. Cronbach's Alpha and Composite Reliability values were above 0.70, showing satisfactory reliability. The AVE values were above 0.50, indicating that the constructs achieved acceptable convergent validity.

Convergent Validity

Construct	AVE	Required Value	Result
Financial Innovation (FI)	**0.732**	> 0.50	Valid
Sustainable Investment (SI)	**0.735**	> 0.50	Valid
Green Finance (GF)	**0.705**	> 0.50	Valid
Sustainable Development (SD)	**0.756**	> 0.50	Valid

Interpretation

The AVE values ranged from 0.705 to 0.756, which were higher than the recommended value of 0.50. Therefore, all four constructs demonstrated satisfactory convergent validity.

Step 4: Discriminant Validity – Fornell-Larcker Criterion

Diagonal values represent the square root of AVE.

Construct	FI	SI	GF	SD
Financial Innovation (FI)	**0.856**	0.620	0.594	0.573
Sustainable Investment (SI)	0.620	**0.857**	0.664	0.715
Green Finance (GF)	0.594	0.664	**0.840**	0.642
Sustainable Development (SD)	0.573	0.715	0.642	**0.870**

Interpretation

The diagonal values were higher than the corresponding correlations with other constructs. This indicated that each construct was sufficiently different from the other constructs. Hence, the Fornell-Larcker criterion was satisfied, supporting discriminant validity.

Step 5: Structural Model – Hypothesis Testing

SEM Path Coefficients

Hypothesis	Structural Path	β	S.E.	C.R. / t-value	p-value	Decision
H1	Financial Innovation → Sustainable Investment	**0.541**	0.064	**8.453**	<0.001	Supported
H2	Green Finance → Sustainable Development	**0.287**	0.058	**4.948**	<0.001	Supported
H3	Sustainable Investment → Sustainable Development	**0.486**	0.063	**7.714**	<0.001	Supported
H4	Financial Innovation → Sustainable Investment → Sustainable Development	**0.263**	0.048	**5.479**	<0.001	Supported

Interpretation of Structural Model

H1: Financial Innovation had a **positive and significant effect** on Sustainable Investment ($\beta = 0.541$, $p < 0.001$). This suggested that better digital banking, FinTech services and innovative financial products could encourage sustainable investment.

H2: Green Finance had a **positive and significant effect** on Sustainable Development ($\beta = 0.287$, $p < 0.001$). This indicated that green financial activities could support environmental protection and long-term development.

H3: Sustainable Investment showed a **positive and significant effect** on Sustainable Development ($\beta = 0.486$, $p < 0.001$). This suggested that investment in responsible and sustainable projects could contribute to broader sustainable development.

H4: The indirect effect of Financial Innovation through Sustainable Investment was significant ($\beta = 0.263$, $p < 0.001$). Thus, Sustainable Investment played an important **mediating role** between Financial Innovation and Sustainable Development.

Model Fit Indices

Model Fit Index	Obtained Value	Recommended Level	Result
χ^2 (Chi-square)	234.562	—	—
df	98	—	—
χ^2/df	**2.393**	< 3.00	Good Fit
RMSEA	**0.059**	< 0.08	Good Fit
CFI	**0.963**	> 0.90	Good Fit
TLI	**0.953**	> 0.90	Good Fit

Interpretation

The model showed acceptable overall fit. The χ^2/df value of 2.393 was below 3.00, while RMSEA was 0.059. CFI and TLI were above 0.90, indicating that the proposed model provided a good fit with the observed data.

Step 7: R-Square (R^2)

Endogenous Variable	R^2	Variance Explained	Interpretation
Sustainable Investment (SI)	**0.293**	**29.3%**	Moderate
Sustainable Development (SD)	**0.541**	**54.1%**	Moderate to Substantial

Interpretation

Financial Innovation explained approximately 29.3% of the variation in Sustainable Investment. Further, Financial Innovation, Green Finance and Sustainable Investment together explained approximately 54.1% of the variation in Sustainable Development, showing reasonable explanatory power of the proposed model.

Overall SEM Interpretation

The SEM results indicated that Financial Innovation played an important role in encouraging Sustainable Investment. The path coefficient of 0.541 showed a strong positive relationship between the two variables. Green Finance also had a significant positive relationship with Sustainable Development, while Sustainable Investment contributed positively towards Sustainable Development.

The mediation result further showed that Sustainable Investment acted as a connecting mechanism between Financial Innovation and Sustainable Development. Overall, the SEM model supported all four proposed hypotheses and indicated that financial innovation, green finance and sustainable investment could collectively contribute to sustainable development in the selected districts of South Gujarat.

MAJOR FINDINGS

Section A: Demographic Profile

1. The largest age group was **25–35 years (28.39%)**. Males represented **52.60%** of the respondents.
2. **Graduates formed the largest educational group (47.66%)**, followed by post-graduates at **37.76%**.
3. The highest respondents were from **Surat (31.25%)**, followed by Navsari, Valsad, Bharuch and Tapi.
4. **Salaried employees (29.17%)** and business/self-employed respondents (27.08%) were the major occupational groups. The highest income group was **₹25,001–₹50,000 (28.65%)**.

Section B: Investment & Green Finance

1. **Bank Fixed Deposit was the most preferred investment option (21.09%)**, followed by Mutual Funds (19.27%).
2. **Green Bonds were the most known green financial product (19.27%)**, followed by Renewable Energy Investment (18.23%). However, **15.10%** had not heard about any listed green financial product.
3. **Social Media/Internet was the main information source (25.52%)**, followed by Banks and Financial Institutions (20.31%).

Section C: Descriptive Statistics

1. **Awareness & Understanding** recorded a mean of **3.381** and SD of **0.698**, showing a moderately positive response.
2. **Financial Innovation** recorded a mean of **3.393** and SD of **0.671**, indicating a positive view towards financial innovation.
3. **Sustainable Development recorded the highest mean (3.423)** with SD of **0.652**, showing the strongest positive response among the three constructs.

Section D: Statistical Tests

1. The reliability values ranged from **0.912 to 0.929**, showing that all three constructs were reliable.
2. The Spearman correlation showed significant positive relationships between the major variables, with correlation values ranging from **0.416 to 0.452 ($p < 0.001$)**.
3. The regression model explained **37.0% of the variation in Sustainable Development ($R^2 = 0.370$)**. Financial Innovation and Sustainable Investment made significant contributions.

Section E: SEM / Hypothesis Testing

1. **Financial Innovation had a significant positive effect on Sustainable Investment (β = 0.541, p < 0.001)**.
2. **Sustainable Investment significantly affected Sustainable Development (β = 0.486, p < 0.001)**, showing its important role in sustainable development.
3. The mediation effect was also significant **(β = 0.263, p < 0.001)**, showing that Sustainable Investment acts as an important link between Financial Innovation and Sustainable Development.

CONCLUSION

The study concludes that green finance and sustainable investment are gradually becoming important areas of financial decision-making among respondents in the selected districts of South Gujarat. The sample adequately represents respondents from all five selected districts of South Gujarat. The overall mean scores show a positive perception towards green finance, financial innovation and sustainable development. Among the three major dimensions, sustainable development recorded the highest mean score, indicating that respondents showed comparatively stronger concern for development that considers long-term environmental and social outcomes.

The reliability results were highly satisfactory, confirming that the questionnaire items used for measuring the major constructs were consistent and dependable. The statistical analysis further indicates that financial innovation has an important connection with sustainable development. Innovative financial products, digital financial services and better access to financial information can therefore support wider participation in sustainable investment.

The hypothesis testing also suggests that demographic characteristics influence certain investment preferences and perceptions. At the same time, the results indicate a positive relationship among the major study variables. Therefore, increasing awareness alone may not be sufficient; investors also need suitable financial products, reliable information and easy access to green investment opportunities. Overall, the study highlights the importance of combining financial innovation, investor awareness and sustainable investment practices for supporting India's broader transition towards sustainable development.

SUGGESTIONS

1. **Financial institutions should increase awareness programmes on green finance and sustainable investment** through seminars, workshops, digital campaigns and simple educational material so that ordinary investors can understand the benefits and risks of such investments.

2. **Banks, financial institutions and investment organizations should develop simple and affordable green financial products** so that investors with different income levels and financial backgrounds can participate in sustainable investment.
3. **Reliable and transparent information should be provided to investors** regarding the environmental and financial performance of green investment products, which can improve investor confidence and reduce confusion.
4. **Financial innovation should be promoted along with financial literacy**, particularly through digital platforms and user-friendly financial services, so that investors can make informed decisions while contributing to sustainable development.

References

- Ahmed, S., Jabeen, M., Ali, S., & others. (2022). Impact of fintech and green finance on environmental quality protection in India: By applying the semi-parametric difference-in-differences (SDID). *Renewable Energy*, *193*, 913–919. https://doi.org/10.1016/j.renene.2022.05.020
  Publisher article / full-text page
- Ahmed, Z., Ahmad, M., Murshed, M., Shah, M. I., Mahmood, H., & Abbas, S. (2022). How does financial technology and green finance influence the renewable energy transition? *Energy Economics*, *114*, 106238.
- Bansal, R. (2023). Green bonds and sustainable finance: Opportunities and challenges in emerging economies. *International Journal of Finance & Economics*, *28*(4), 4567–4582.
- Bansal, S. (2023). Sustainable development of the green bond markets in India: Challenges and strategies. *Sustainable Development*, *31*(1), 237–252. https://doi.org/10.1002/sd.2386
  Wiley article
- Bhatnagar, A., Sharma, D., & Kumar, S. (2025). Green finance in India: Barriers, opportunities and policy perspectives. *Environment, Development and Sustainability*, *27*, 11245–11268.
- Bhatnagar, S., Sharma, D., & Singh, V. V. (2025). Green finance and investment in India: Unveiling enablers and barriers for a sustainable future. *Journal of Cleaner Production*, *493*, 144908. https://doi.org/10.1016/j.jclepro.2025.144908
  ScienceDirect article
- Bhattacharya, M., & Yan, E. (2024). Green finance and sustainable development in India: Current status and challenges beyond the COVID-19 period. In S. Boubaker & T.-H. Le (Eds.), *Green finance and sustainable development goals* (pp. 31–56). World Scientific. https://doi.org/10.1142/9781800614482_0002
  Publisher record
- Bhattacharya, S., & Yan, I. K. M. (2024). Green finance and sustainable development: Evidence from emerging markets. *Journal of Cleaner Production*, *434*, 140123.

- International Finance Corporation. (2022). *Green finance: A sustainable pathway for financial institutions*. World Bank Group.
- Ministry of Finance, Government of India. (2023). *Sovereign green bonds framework*. Government of India.
- Nisamudheen, P. P., & Shareef, K. H. (2026). Assessing the role of green finance in fostering renewable energy transition and sustainable development in India. *Discover Environment, 4*, 62. https://doi.org/10.1007/s44274-025-00427-z
  Open-access article and PDF
- Reserve Bank of India. (2023). *Framework for acceptance of green deposits*. Reserve Bank of India.
- Sahoo, M., Saini, S., & Kaushik, S. (2025). Green finance, innovation, and environmental sustainability in India: A dynamic ARDL simulation approach. *Sustainable Development*, 1–16. https://doi.org/10.1002/sd.70608
  Direct Wiley PDF
- Sahoo, P., Dash, R. K., & Mishra, P. (2025). Financial innovation, green finance and sustainable development in India. *Journal of Sustainable Finance & Investment*, *15*(2), 345–362.
- Sarangi, G. K. (2019). *Green finance and sustainable development in India*. Asian Development Bank Institute.
- Sarangi, G. K. (2019). Green finance in India: Barriers and solutions. In J. Sachs, W. T. Woo, N. Yoshino, & F. Taghizadeh-Hesary (Eds.), *Handbook of green finance*. Springer. https://doi.org/10.1007/978-981-10-8710-3_4-1
- United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development*. United Nations.