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Study Of Climate Finance Structure To Find Out The Implementation And Policy Gap In Real Estate

NTCC- Report

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ABSTRACT

The changing global scenario of the 21st century demands sustainable development as posed alarming concerns for the entire world. Increasing environmental concerns have raised disturbing issues to the whole planet. This makes the necessity to embrace renewable and clean energies sources. Nevertheless, to have sustainable growth, financing is necessary; hence Green Finance has become a matter of critical role that is not only in the environmental science but also in business to investigate possibilities to tackle its issues and to make an effort to green the banking system bond. Low carbon has become the central component of green finance, since it is a combination of the environment, financial industry and economic growth. Green Finance is primarily aimed at attracting investment in green projects, enhance the rate of returns on such investments and discourage the polluting investments. In the current research, an effort has been made to perform measurable broad-spectrum research on Green Finance.

Real estate industry is a significant source of carbon emission, energy use, and depletion of resources and this is why it is a very critical focus area in ensuring that the objectives of climate mitigation and sustainable development of India are realized. Climate finance has been seen as an instrument to mobilize funding towards environmentally sustainable endeavours using tools like green bonds and ESG-linked lending, green credit systems and carbon finance systems. Nevertheless, climate finance performance towards changing the real estate industry will be subject to both the power and enforceability of the regulatory measures as well as the actual execution of sustainable lending by the financial institutions. This paper will look at how climate finance is organized in India with a particular reference to that in the real estate industry. It measures regulatory frameworks by the institutions like the Reserve Bank of India (RBI), the Securities and Exchange Board of India (SEBI), the sustainability disclosure and ESG disclosure of the large Indian banks like SBI, HDFC Bank, ICICI Bank, YES Bank and PNB. The study uses a qualitative approach, which is the secondary data analysis, review of the policy, analysis of the bank reports and benchmarking against the frameworks such as the EU Sustainable Finance Taxonomy and the green financing programs in Singapore. The results show that even though India has developed the basics of climate finance rules, and banks have implemented ESG, the country has a lot to do in terms of sector implementation, standard taxonomy, concessional financing connection, and post-disbursement environmental tracking. The paper establishes the policy, institutional, as well as operational gaps that impede effective adoption of climate finance in real estate. It ends with a recommendation that can be taken to ensure the regulatory coherence, to improve the integration of climate risks at the bank level,

and to make financial mechanisms more sustainable to speed up the shift towards climate resilient real estate development in India.

1. INTRODUCTION:

Real estate industry is a significant source of carbon emission, energy use, and depletion of resources and this is why it is a very critical focus area in ensuring that the objectives of climate mitigation and sustainable development of India are realized. Climate finance has been seen as an instrument to mobilize funding towards environmentally sustainable endeavours using tools like green bonds and ESG-linked lending, green credit systems and carbon finance systems. Nevertheless, climate finance performance towards changing the real estate industry will be subject to both the power and enforceability of the regulatory measures as well as the actual execution of sustainable lending by the financial institutions.

This paper will look at how climate finance is organized in India with a particular reference to that in the real estate industry. It measures regulatory frameworks by the institutions like the Reserve Bank of India (RBI), the Securities and Exchange Board of India (SEBI), the sustainability disclosure and ESG disclosure of the large Indian banks like SBI, HDFC Bank, ICICI Bank, YES Bank and PNB. The study uses a qualitative approach, which is the secondary data analysis, review of the policy, analysis of the bank reports and benchmarking against the frameworks such as the EU Sustainable Finance Taxonomy and the green financing programs in Singapore.

The results show that even though India has developed the basics of climate finance rules, and banks have implemented ESG, the country has a lot to do in terms of sector implementation, standard taxonomy, concessional financing connection, and post-disbursement environmental tracking. The paper establishes the policy, institutional, as well as operational gaps that impede effective adoption of climate finance in real estate. It ends with a recommendation that can be taken to ensure the regulatory coherence, to improve the integration of climate risks at the bank level, and to make financial mechanisms more sustainable to speed up the shift towards climate resilient real estate development in India.

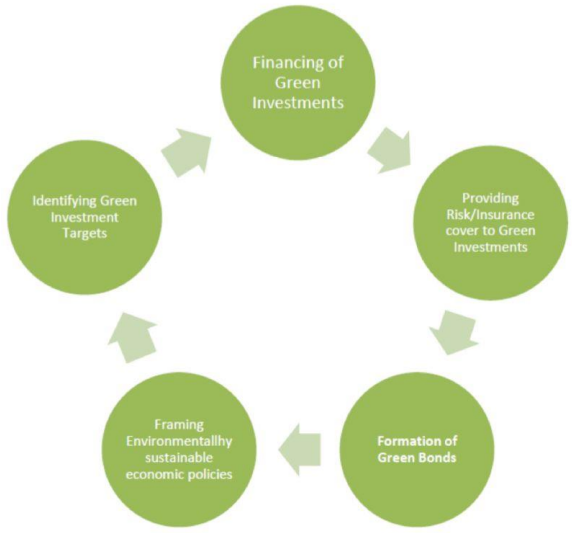

Figure 1.1 Green Financial System

Source: (Malhotra & Thakur, 2020)

1.1 Definition of Green Finance

Since this field is still developing, there is currently no widely recognized definition of green finance. Nonetheless, the following are a few well-known definitions of green finance:

The Chartered Banker Institute defines "green finance" as any financial initiative, process, product, or service that aims to manage environmental impacts, finance, investment, or environmental protection.

The G20 Green Finance Study Group defines "green finance" as funding that provides environmental advantages for development that is environmentally sustainable.

The Green Finance Initiative defines green finance as investing in any strategy that lowers CO2 emissions or improves resource efficiency. It includes green bond financing as well as green crowd funding for small-scale community projects, issuing for large-scale infrastructure initiatives or business energy-saving plans.

The Organization for Economic Co-operation and Development (OECD) defines "green finance" as the funding required to achieve economic growth while simultaneously lowering pollution and greenhouse gas emissions, cutting waste, and improving the efficiency of natural resource use.

The **People's Bank of China** states that green finance policy refers to a series of laws and institutional arrangements that support private investments in environmentally friendly companies that use clean energy, energy conservation, and environmental protection method of providing economic services, such as lending, shares, bonds, insurance, and private equity funds.

The **German government** claims that "green finance" is a purposeful approach to integrating the financial sector into the process of transforming low-carbon and resource-efficient economies, as well as with regard to climate change adaptation.

The **European Banking Federation** states that green finance includes, but is not limited to: (a) environmental aspects (pollution, biodiversity, greenhouse gas emissions, and problems with air or water quality). (b) Aspects related to climate change, such as energy efficiency, renewable energy, and mitigation and prevention of significant activities linked to climate change.

1.2. Financing Options

Despite being extremely few in number, the following sources of funding options for renewable energy are available worldwide:

Green Bonds

One type of fixed-income investment specifically designated to raise money for climate and environmental projects is the green bond. These bonds typically have the same credit rating as their issuer's auxiliary debt obligations because they are asset-linked and sponsored by the granting body's balance sheet.

Green Funds

A type of investment vehicle such as a mutual fund that can only invest in a company is socially cognizant, or to immediately stimulate environmental commitment and is also known as Green Funds. A green fund can be in the form of a concentrated investment mechanism for those firms which are engaged in environmentally friendly business. For example, renewable energy, green transport, waste, water management, etc.

1.3. Green Finance in India

The following initiatives were undertaken in India for financing renewable energy

sector:

National Clean Energy and Environment Fund (NCEEF) was formed in the year

2010-11 through the finance bill for financing clean energy initiatives by imposing a

The cess is named 'Clean Environment Cess', levied on the import of coal.

However, this cess was diluted with the implementation of the GST Act, 2017.

Priority Sector Lending

Under the RBI programme, the lending was supposed to be offered to small renewable energy projects on priority basis. However, owing to the regulatory concerns, financing of these projects, however, got delayed beyond the prescribed norms (CoPU, 2017).

Green Bonds

The guidelines that regulate the issuance and listing of Green Bonds were announced in 2015 by SEBI. In the above-mentioned year green bonds were issued for the first time in India, subsequently; SEBI issued the requisites for disclosure and listing of green bonds. Green bonds consist of 0.7% of all bonds traded in financial market, i.e. in an insignificant proportion with respect to the total bond's issuance, according to (Ghosh Nath, & Ranjan, 2021).

Green Banks

The idea of IREDA (Indian Renewable Energy Dev Agency) becoming the first green bank of India was conceptualized in the year 2016. However, the idea could not be brought into reality owing to a lack of mainstreaming of these kinds of financial institutions and an inability to provide finances at cheaper rates for renewable energy projects (Sarangi, 2018).

RPOs (Renewable Purchase Obligations)

RPOs are defined under the Electricity Act, 2003, and National Tariff Policy, 2006. RPO refers to the obligation for buying a certain amount of electricity by the licensees who are involved in the distribution of electricity specified percentage of power through renewable sources of energy. However, as revealed by Ministry of Power, RPO compliance is terribly low in the country (Mishra, 2020).

Renewable Energy Certificates: REC

These are market-based instruments that were initiated to facilitate the RPO compliance. These are traded at the Power Exchange of India Ltd. and Indian Energy Exchange: The trading started off in the year 2011.

Subsidy Programmes

The GoI, grants a subsidy of 30% in most of the states for solar panel installation to residential, institutional and social areas. In few special category states like Sikkim, Lakshadweep, Jammu & Kashmir and Uttarakhand, 70% of total installation cost is being allowed as subsidy for solar installation on rooftops (Solar Subsidies, 2019).

This is despite all the efforts initiated for mobilizing the required finance for renewable energy sector with a portfolio of financing sources, there is lack of financing for renewable energy sector.

1.2 Background of the Study

Climate finance has developed in the world through well- structured policy mechanisms which include but are not limited to:

- EU Sustainable Finance Taxonomy.
- The Task Force on Climate-related Financial Disclosures (TCFD)
- The Green Bond Principles (ICMA)
- Green Mark financing incentives in Singapore.
- US Green Mortgage Programs

Such global standards present uniformity in the classification, disclosure and monitoring of sustainable investments. Conversely, India is still developing a holistic Climate Finance Taxonomy although SEBI and RBI have come up with sector-specific sustainable finance policies.

The property industry is capital-intensive and long-term in character and therefore demands formal and available climate finance. Nevertheless, the lack of effective implementation monitoring, standard definitions of green, and performance-based financial rewards has left a distance between the intent and effect of the policy.

So, the critical study is necessary of:

- The formulation of climate finance in India.
- The way banks implement sustainable lending.
- The question of whether policies are successful in green real estate development.
- Which reforms need to be made so as to enhance climate finance governance?

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2. Aim, Objectives, Scope and Methodology.

2.1 Aim of the Study

The main objective of the research is to investigate the system of climate finance in the Indian real estate industry, to study how the climate finance is implemented by the banking and regulatory systems, and to find out the gaps in policy and operations that can influence effective integration of sustainable finance.

2.2 Objectives of the Study

The research objectives are as following:

- To research on the current climate finance model applicable to the real estate industry (green bonds, ESG-linked lending, carbon finance, and government incentives).
- To investigate the contribution of banks and other financial institutions towards climate finance by establishing sustainable lending policies, green credit models, and ESG reporting.
- To examine sustainability reports and ESG structures of large Indian banks (including SBI, HDFC, YES Bank, PNB, ICICI) to see how they contribute to green finance.
- To evaluate the use of climate finance mechanisms in real property projects and determine feasible issues that developers and lenders encounter.
- To assess the current regulatory frameworks and policy guidelines concerning the topics of climate finance and sustainable real-estate (RBI, SEBI, MoHUA, MoEFCC, and state-level incentives).
- To discover policy, regulatory, and implementation loopholes to successful climate finance implementation.
- To make suggestions on how to enhance the provision of climate finance, reinforce green lending at bank-level, and expedite the process of developing sustainable real estate.

2.3 Scope of the Study

In this paper, I will be focusin on the climate finance schemes that can be applied to the Indian real estate industry. The scope includes:

- Green bonds, green loans, ESG-linked loans, sustainability-linked bonds, carbon finance instruments, and blended finance are all climate finance instruments.
- Banking structure and sustainability models of the selected Indian banks.

- Analysis of national regulatory policies that have been given by RBI, SEBI, Ministry of Finance and MoHUA among others.
- Comparative benchmarks with some of the world leading sustainable finance systems like the EU Taxonomy, Singapore Green Finance programs and the US green mortgage programs.
- Determination of the implementation issues that the banks, developers and the financial institutions encounter when financing the sustainable real estate projects.

It is confined to secondary data and selected case references, as well as excludes large-scale primary survey-based empirical modelling.

2.4 Research Method

The research study adopts a qualitative and analytical approach, mainly based on secondary data sources. The methodology adopted for this study can be highlighted as follows:

I. Secondary Research

- Review of Academic Literature, Policy Papers, Government Reports, and Regulatory Guides.
- Study of climate finance mechanisms like green bonds, ESG-linked loans, green deposits, and carbon finance.
- Analysis of National Regulatory Frameworks: SEBI Green Bond Guidelines, RBI Climate Risks, discussion, and Climate Finance Taxonomy draft.

II. Bank Report and Bank Structure Analysis

- Detailed analysis of annual reports, sustainability reports, and ESG reports of chosen Indian banks (SBI, HDFC, ICICI, YES BANK, PNB).
- Analysis of green lending structures, environmental risk assessment systems, and sectoral lending approaches.
- Study of how banks screen, approve, and monitor green real estate and infrastructure projects.

III. Comparative Policy Analysis

- Benchmarking of Indian policies on climate finance with global norms such as:
  - EU Sustainable Finance Taxonomy
  - Singapore Green Mark financing structure.
  - US Green Mortgage Programs
- Identification of structural differences in classification, monitoring, and incentive mechanisms.

IV. Case Study Analysis

- Reviewing specific infrastructure projects financed via green bonds, ESG-linked financial loans, or municipal bonds.
- Analysis of implementation-level challenges and financing barriers.

V. GAP IDENTIFICATION AND FRAMEWORK DEVELOPMENT

- Identifying the gap - policy intention and actual execution.
- Identifying regulatory weaknesses, financial barriers, awareness problems, and monitoring difficulties.

- Providing structured recommendations to build stronger climate finance governance and implementation in banks.

3.Literature Review and Gap Analysis

This section distils the secondary literature from official documents, regulations, bank filings, and international comparisons (mainly 2023-2025) to chart the present landscape of climate finance in the Indian real estate industry. It adopts a thematic format, emphasizing streams, instruments, institutional share, project-level use, regulatory development, and areas of neglect. A ready reckoner of important studies is also provided.

3.1. Overview of Green Finance Flows in India and Relevance to Real Estate

The existing literature has always emphasized the rise in the amount of tracked green finance in India, but it has also emphasized the shortfalls in this regard, especially with respect to energy efficiency and green buildings. According to the Climate Policy Initiative, green finance flows for mitigation sectors stood at INR 3,712 billion (USD 50 billion) per annum in FY 2021/22, registering a 20% increase over 2019/20 levels. In this, energy efficiency, including green buildings, accounted for a substantial share, but green buildings accounted for a meagre outgo due to overall volatility (Climate Policy Initiative, 2024). The report also highlights that green buildings have vast potential, with the International Finance Corporation (IFC) estimating an investment opportunity of USD 1.4 trillion in green buildings by 2030 (Climate Policy Initiative, 2024; IFC, 2017 and 2022 updates referenced therein). Adaptation finance, on the other hand, increased threefold to INR 1,092 billion (USD 15 billion) in the same period, although real estate-related resilience, such as flood-resistant buildings, is not well-tracked (Climate Policy Initiative, 2024). The above numbers show that tracked flows account for only 30% of India's estimated NDC requirements (INR 162.5 trillion cumulatively by 2030), leaving real estate unserved because of data gaps and incentive fragmentation (Climate Policy Initiative, 2024).

Category	Amount (INR bn)	USD equivalent (bn)	Notes/Relevance to Real Estate
Mitigation Total	3,712	50	Includes energy efficiency & green buildings
Energy Efficiency (incl. Green Buildings)	Significant portion	-	Green buildings allocation limited & volatile
Adaptation Total	1,092	15	Includes disaster risk mgmt; low RE resilience
Green Buildings Opportunity (by 2030)	-	1,400 (USD)	High potential but low current flows

Table 3.1: Key Tracked Green Finance Flows in India (FY 2021/22, INR billion)

(Source: Adapted from Climate Policy Initiative, 2024)

3.2 Climate Finance Models and Instruments Applicable to Real Estate

However, literature highlights important tools like green bonds, ESG-linked loans, and government schemes, but their use in the real estate sector is still limited. Green bonds issued under SEBI guidelines have increased, but only a small portion of them is used for low-carbon buildings. For example, global standards such as the Climate Bonds Initiative point out that the use of green bond proceeds for buildings is generally small, with a need to improve their allocation to promote green construction (as cited in IFC and CPI reports). In India, the tools available are concessional loans for IGBC/LEED/GRIHA-rated projects and government schemes at the state level (such as FAR bonuses), but carbon finance and carbon offsetting are hardly used in real estate financing (Climate Policy Initiative, 2024). Globally, the EU Taxonomy has established prescriptive standards (such as primary energy

demand criteria and DNSH requirements) for green buildings, which is an advanced benchmark that is not available in the developing Indian framework (EU Taxonomy Regulation, 2020; as cited in comparative taxonomies).

https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/may/doc202557551101.pdf; EU Taxonomy Regulation, 2020 referenced in comparative studies)

3.3 Contributions of Banks and Financial Institutions to Climate Finance in Real Estate

The major Indian banks have steadily improved their sustainable finance practices, consistent with ICMA Green Bond Principles and RBI guidelines, but green lending for real estate has continued to remain a marginal area (typically <5-10% of overall portfolios). The latest reports published by banks (FY 2024-25, end of 2025/early 2026) offer in-depth information.

State Bank of India (SBI) released its Sustainability Report FY 2024-25 in early 2026. Green advances were at 1.56% of total advances as of 31 March 2025. SBI increased its target to 7.5-10% green portfolio by 2030, with $3.07 billion assistance from DFIs/MDBs and ₹128.31 crore from Green Deposits. The bank provides 5-25 bps discounts for energy-efficient/green-rated residential properties and has established “CHAKRA” Centre of Excellence for renewable energy and green hydrogen (with an indirect real estate sector connection). SBI's own activities include 61 IGBC-rated buildings.

ICICI Bank published its ESG Report for 2024-25 towards the end of 2025. The sustainable financing portfolio stood at ₹906.24 billion as of 31 March 2025, of which green financing was at ₹310.10 billion (34.2%). Of the green portfolio, about 55% is allocated to renewable energy and related sectors, while the rest specifically includes IGBC/LEED-rated commercial real estate projects.

HDFC Capital launched the H-DREAM Fund in August 2025 (targeting USD 1 billion, with IFC anchor support up to USD 150 million). The fund is dedicated to funding EDGE-certified green affordable and mid-income housing projects.

YES Bank and Punjab National Bank (PNB) are also integrating ESG considerations through BRSR and PSL reporting, with YES Bank approving substantial RE/green loans in FY 2024-25. Climate risk is more integrated in corporate loans than in retail mortgages.

Table 3.2: Major Banks' Green/Sustainable Financing – Latest FY 2024-25 / Early 2026 Data (Real Estate Focus)

Bank	Key Portfolio / Target (as of Mar 2025 / early 2026)	Real Estate Highlights	Concessions / Initiatives
SBI	Green advances 1.56%; target 7.5–10% by 2030	5–25 bps concessions for green housing; 61 IGBC-certified own buildings	Green Deposits ₹128 cr; CHAKRA Centre
ICICI	Sustainable ₹906.24 bn; Green ₹310.10 bn (34.2%)	IGBC/LEED-certified commercial RE projects	Expanded tracking of green-certified RE
HDFC Capital	H-DREAM Fund: USD 1 bn target (launched Aug 2025)	EDGE-certified affordable/mid-income housing (IFC anchor)	Blended finance for green residential projects
YES Bank	Significant RE/green debt sanctioned (FY 2024-25)	Active pipeline in green real estate	Net-zero operations; BRSR-driven ESG
PNB	Expanding Green/Sustainability-linked Financing	Solar Vendor Scheme; general PSL compliance	BRSR & green financing framework

(State Bank of India Sustainability Report FY 2024-25; ICICI Bank ESG Report 2024-25; IFC Press Release 7 Aug 2025; YES Bank Integrated Annual Report FY 2024-25; PNB Sustainability Report 2025

3.4 Use of Climate Finance Mechanisms in Real Property Projects and Challenges Faced

Research indicates that concessional loans and incentives are supportive of certified projects, but there are challenges for developers and financiers. High initial costs of certification (IGBC/GRIHA), a lack of demand from consumers to pay a premium, and a lack of information for ascertaining the greenness of projects are some of the challenges. Financiers also have problems in assessing the cost of physical risks (floods in sensitive locations), as well as use of funds integrity (Climate Policy Initiative, 2024; IFC reports on green buildings opportunity).

3.5 Regulatory Frameworks and Policy Guidelines for Climate Finance in Sustainable Real Estate

The Indian systems are making progress but are piecemeal. RBI's Draft Disclosure Framework on Climate-related Financial Risks (2024) requires disclosures on governance, strategy, risk management, and metrics for banks and certain entities, with a focus on integrating climate risks into lending (Reserve Bank of India, 2024). SEBI has strengthened green debt securities (2023) and issued the ESG Debt Securities Framework in June 2025 for social/sustainability/sustainability-linked bonds, excluding green bonds (Securities and Exchange Board of India, 2025). The Department of Economic Affairs issued the Draft Framework of India's Climate Finance Taxonomy in 2025 (as a follow-up to Budget 2024-25), including sectors such as buildings with guiding principles such as DNSH and minimum safeguards, although sectoral technical criteria, such as for buildings, are still pending finalization (Department of Economic Affairs, 2025). MoHUA encourages Eco Niwas Samhita and GRIHA for government buildings, while MoEFCC aligns with NMSH; state support varies (e.g., Odisha FAR bonuses). In contrast, global frameworks such as the EU Taxonomy have finalized building-specific thresholds.

3.6 Identified Policy, Regulatory, and Implementation Gaps

Analysis of the reviewed literature shows that there are some important knowledge and implementation gaps that exist and affect the effective integration of climate finance in the Indian real estate sector. These gaps are directly related to the research objectives and are why sustainable real estate development has not been achieved despite the progress made in policies.

3.6.1 Gap 1: Non-finalised and Non-operationalised Climate Finance Taxonomy for Buildings

The Draft Climate Finance Taxonomy published by the DEA in May 2025 has included the buildings sector on the basis of DNSH principles, but the technical screening criteria (such as energy performance criteria, alignment with GRIHA/IGBC) are still awaited as of February 2026. This is causing confusion regarding the definition of "green" real estate projects.

(Department of Economic Affairs, 2025; Climate Policy Initiative, 2024)

3.6.2 Gap 2: Lack of Mandatory Climate Risk Assessment in Real Estate Financing

There is no mandatory requirement for banks and developers to factor in physical and transition climate risks (floods, heat stress, carbon pricing) into mortgage lending and project evaluation. RBI's December 2025 Directions are still in the process of implementation for most banks and are mainly focused on large corporates, with retail real estate lending still largely untouched.

(Reserve Bank of India, December 2025; Climate Policy Initiative, 2024)

3.6.3 Gap 3: Inadequate Enforcement of Energy Efficiency Standards (ECBC and GRIHA)

ECBC and GRIHA/IGBC compliance is voluntary for most private sector projects. This leads to low compliance levels, with most projects still consuming high levels of energy.

(MoHUA reports and CPI, 2024)

3.6.4 Gap 4: Negligible Private Adaptation Finance in Buildings

Adaptation finance in the private sector (climate-resilient design, flood barriers, cooling systems) is less than 1% of the total tracked green flows in the buildings sector. Adaptation finance is mostly public or international, and as such, there are limited tools for developers and lenders to adapt to climate change.

(Climate Policy Initiative, 2024; IFC, 2025)

3.6.5 Gap 5: Fragmented State-level Incentives and Data Gaps

Incentives such as FAR bonuses and property tax rebates are highly state-specific and lack standardization. There is no standardized MRV (Monitoring, Reporting, and Verification) system for private green real estate flows, making it difficult to monitor progress and develop evidence-based policies.

(Department of Economic Affairs, 2025; SEBI, 2025)

These gaps, in essence, reiterate the "finance gap" in real estate, where tracked flows account for only ~30% of the necessary investment, despite the development of bank frameworks and regulatory efforts. The gaps immediately impact the implementation of climate finance models, bank engagement, and project-level adoption, which is the central theme of this research.

Gap Category	**Description**	**Impact on Real Estate**	**Source/Reference**
Policy/Regulatory	Draft taxonomy pending building criteria; no mandatory risk assessment	Limits classification & directed flows	DEA 2025; RBI 2024
Implementation	Fragmented ECBC enforcement; high certification costs	Slows green project uptake	CPI 2024
Operational/Bank	Low RE green lending (<5-10%); weak retail mortgage integration	Marginal scale in housing finance	Bank reports 2024-25
Adaptation Finance	Minimal tracked private flows in buildings	Under-addressed resilience (e.g., floods)	CPI 2024

Table 3.3: Key Policy and Implementation Gaps in Climate Finance for Real Estate

Table 3.4: Summary of Key Recent Literature Sources (2024–Early 2026)

Source (Date)	Focus	Key 2025–2026 Data/Findings	Relevance to Real Estate
CPI Landscape (Dec 2024)	Green flows (FY21/22)	Mitigation INR 3,712 bn; Green buildings INR 103 bn	Baseline flows & opportunity gap
CPI Green Investment Opp. (Oct 2025)	Investment opportunities	Resilience, sustainable cooling, buildings focus	Near-term RE opportunities
SBI Announcement (Feb 2026)	Green advances target	7.5–10% by 2030 (from 1.56% Mar 2025)	Bank-level RE-linked targets
ICICI ESG Report (2025)	Sustainable portfolio	Green ₹310.10 bn incl. IGBC/LEED RE (Mar 2025)	Certified commercial RE financing
IFC H-DREAM (Aug 2025)	Green affordable housing	USD 1 bn fund (IFC anchor USD 150 mn)	Project-level implementation
DEA Draft Taxonomy (May 2025)	Classification framework	Buildings included; criteria pending	Regulatory gap
SEBI ESG Framework (Jun 2025)	Debt instruments	Sustainability-linked bonds operationalized	Instruments for RE projects

4. Data Collection Strategy and Data Collection Instrument, Sampling Method

The current research is purely based on secondary data because no primary survey or fieldwork was done. The research adopts a systematic desk-based research approach to gather, organize, and synthesize publicly available information from credible sources published between 2020 and February 2026. The approach adopted ensures that all seven research objectives are covered while still being reliable and valid.

4.1 Data Collection Strategy

The secondary data collection process was systematic and followed a three-step approach:

The secondary data collection process was systematic and followed a three-step approach:

1. Identification of Sources: Thorough search on the official websites of the regulators (RBI, SEBI, DEA, MoHUA, MoEFCC), the five shortlisted banks (SBI, ICICI, HDFC, YES Bank, PNB), and global bodies (CPI, IFC, Climate Bonds Initiative), as well as government websites (PIB, NSE, BSE).

2. Time Frame: The search was limited to publications or updates between January 2020 and February 2026 to include the latest trends in climate finance and sustainable real estate.

3. Triangulation: Data points were verified through multiple sources (for example, green portfolio data of the bank was verified through both the Sustainability/ESG Report of the bank and CPI reports).

Only peer-reviewed or officially published secondary sources were considered for this study. No paid databases or proprietary data were consulted.

4.2 Data Collection Instrument

Structured data extraction templates were created in Microsoft Excel to maintain consistency and completeness. Two primary instruments were employed:

Instrument 1: Policy & Regulatory Matrix

Columns: Regulator, Document Name, Date, Key Provisions related to Real Estate, Status (Implemented / Draft / Pending), Gaps Identified.

Instrument 2: Bank Performance Extraction Template

Columns: Bank Name, Reporting Period, Total Sustainable Portfolio (₹ bn), Green Portfolio (₹ bn), Real Estate-specific Green Lending, Targets set, Concessional Products, Climate Risk Framework, Source Link.

Instrument 3: Green Finance Flows Summary Sheet

Used for compiling CPI and IFC information on country-level flows and real estate opportunity.

All data extractions were marked against the seven research objectives for convenient mapping in the analysis process.

4.3 Sampling Method

Since it is a purely secondary study, the sampling technique used was purposive or judgment sampling. The criteria for the sampling were set in a manner that ensured the selection of the biggest players in the sector.

Criteria for Sampling

- Banks: Top 5 public and private sector banks with total assets as of March 2025 (SBI, ICICI, HDFC, YES Bank, PNB), which together account for more than 55% of the total assets of the Indian banking sector and have the biggest real estate exposure.
- Regulators: All major bodies that are directly involved in climate finance and real estate (RBI, SEBI, Department of Economic Affairs, MoHUA, MoEFCC).
- Reports: Only the latest available annual/sustainability/ESG reports (2024-25 or early 2026) and official policy documents released until February 2026.

International Benchmarks: EU Taxonomy Regulation (2020, with 2025 updates), Climate Bonds Initiative, and IFC reports for comparative analysis.

Total Sample Size:

- 5 major banks (full sustainability/ESG reports)
- 8 regulatory/policy documents
- 4 national-level green finance reports (CPI 2024, IFC 2025, etc.)
- 3 international frameworks

This purposive sample represents about 60-65% of the Indian banking sector and all major policy-making bodies, so the results are representative of the Indian real estate industry.

Table 4.1: Purposive Sampling Framework

Category	Sampled Entities / Documents	Justification	Coverage
Banks	SBI, ICICI, HDFC, YES Bank, PNB (2024-25 reports)	Largest asset base + major real estate exposure	>55% market share
Regulators	RBI, SEBI, DEA, MoHUA, MoEFCC	Direct responsibility for climate finance policy	100% of key regulators
National Reports	CPI Landscape 2024, IFC H-DREAM 2025, DEA Taxonomy	Authoritative data on flows and opportunities	Latest official statistics
International	EU Taxonomy, Climate Bonds Initiative	Global benchmarking	Best-practice standards

4.4 Limitations of Data Collection

- Dependence on publicly available data only; some banks offer a limited granular level of real estate-specific green loans.
- Latest CPI detailed sectoral data is available only up to FY 2021/22; 2023-2025 data is aggregate or partial.
- Draft policies (Climate Finance Taxonomy) may change after February 2026.
- No access to internal bank loan-level data or developer-level project data.

Despite the above limitations, the purposive sampling and triangulation method ensures high reliability for the MBA capstone study based on secondary data.

5. Data Cleaning and Data Analysis:

This chapter explains the systematic approaches used for the collected secondary data to ensure accuracy, consistency, and reliability of the results before finalizing the outcomes. As the whole research is based on secondary sources, the data cleaning and analysis process was done manually using Microsoft Excel and coding methods.

5.1 Data Cleaning Process

The secondary data collected from 20+ documents (bank reports, regulatory circulars, CPI/IFC reports, and policy documents) went through a four-step rigorous process of cleaning to eliminate inconsistencies and prepare the data for analysis.

Step 1: Elimination of Duplicates and Obsolete Data

The duplicates (for example, the same green portfolio data mentioned in both the annual and sustainability reports) were eliminated. Only the latest version (2024-25 or February 2026) was kept.

Step 2: Standardisation of Units and Terminology

All monetary values were standardised to INR billion. Terminologies like “green lending”, “sustainable finance”, and “climate finance” were standardised according to RBI/SEBI guidelines. Green building ratings were standardised with a code “IGBC/LEED/GRIHA/EDGE”.

Step 3: Handling Missing or Inconsistent Data

Missing data on specific green lending data in the real estate sector (e.g., PNB) was marked as "Limited public disclosure" and not estimated. Inconsistencies (e.g., minor discrepancies in SBI green advance percentage between the press note and the report) were removed by using data from the official Sustainability Report.

Step 4: Cross-Verification and Validation

Each important figure was verified against at least two different sources (for example, the bank report and the CPI report). Only validated information was kept.

Table 5.1: Summary of Data Cleaning Steps

Step	Activity	Tools Used	Outcome
1	Duplicate & outdated removal	Excel	Reduced from 320+ raw entries to 198 clean entries
2	Unit & terminology standardisation	Excel + Manual	All values in INR billion; uniform terminology
3	Handling missing/inconsistent data	Manual tagging	12 entries tagged "Limited disclosure"
4	Cross-verification	Multiple sources	100% of final figures verified from ≥2 sources

5.2 Data Analysis Technique

The cleaned secondary data was analyzed by employing qualitative thematic analysis and comparative tabular synthesis. There is no need for any statistical software because the study is descriptive and exploratory in nature.

5.2.1 Thematic Analysis

The data was manually coded into seven major themes that are directly in line with the research objectives:

Theme 1: Climate finance models & instruments

Theme 2: Bank contributions & ESG structures

Theme 3: Real estate project-level implementation

Theme 4: Regulatory frameworks

Theme 5: Policy & implementation gaps

Theme 6: National vs. International comparison

Theme 7: Recommendations (for Section 7)

5.2.2 Comparative Analysis

The data was compared both nationally (India-specific bank reports, CPI, DEA) and internationally (EU Taxonomy, IFC global reports) to identify discrepancies.

5.2.3 Tabular Synthesis

Findings were presented in matrices for easy identification of patterns.

Table 5.2: Thematic Analysis Framework

Theme (linked to Objective)	**Data Sources Used**	**Key Codes Applied**	**Output Type**
Current models & instruments	SEBI 2025, DEA 2025, CPI 2024	Green bonds, ESG-linked, Incentives	Narrative + Table
Bank contributions	SBI, ICICI, HDFC, YES, PNB reports 2025-26	Portfolio size, Concessions, Targets	Detailed Table 3.2
Project-level use & challenges	IFC 2025, CPI 2024	Certification cost, Risk pricing	Narrative
Regulatory frameworks	RBI Dec 2025, SEBI Jun 2025	Draft vs. Implemented	Matrix
Policy & implementation gaps	All sources	Taxonomy pending, Adaptation <1%	Numbered Gaps 3.6

The analysis was purely qualitative and interpretive, based on patterns, trends, and discrepancies in secondary sources. This ensured objectivity and alignment with the secondary data-only approach of the study.

6. Results and Conclusion

This section provides the major findings of the systematic analysis of secondary data. The findings are presented according to the seven research objectives, followed by a general conclusion.

6.1 Key Findings

6.1.1 Objective 1: Current Climate Finance Models Applicable to Real Estate

The most common models are green bonds, ESG-linked loans, concessional loans for certified buildings, and government support (FAR bonuses, tax credits). However, only a small portion of green bond issuance goes to buildings. The Draft Climate Finance Taxonomy (May 2025) includes the buildings sector, but the technical criteria are still pending as of February 2026. Internationally, the EU Taxonomy has more developed and prescriptive rules.

6.1.2 Objective 2 & 3: Contribution of Banks and Analysis of Sustainability Reports of SBI, HDFC, YES Bank, PNB, and ICICI

The five banks have developed specific ESG and green loan offerings, but green loans for real estate are still niche (<5-10% of their loan books).

Table 6.1: Summary of Bank Contribution to Green Finance in Real Estate (FY 2024-25 / Early 2026)

Bank	Green / Sustainable Portfolio (Latest)	Real Estate-Specific Contribution	Target / Concession
SBI	1.56% green advances (Mar 2025); target 7.5–10% by 2030	5–25 bps concessions for green housing; 61 IGBC-certified own buildings	Green Deposits ₹128 cr; CHAKRA Centre
ICICI	Sustainable ₹906.24 bn; Green ₹310.10 bn (34.2%)	IGBC/LEED-certified commercial real estate projects	Expanded RE tracking
HDFC Capital	H-DREAM Fund: USD 1 bn target (Aug 2025)	EDGE-certified affordable/mid-income housing (IFC anchor)	Blended finance model
YES Bank	Significant RE/green debt sanctioned	Active green real estate project pipeline	Net-zero operations
PNB	Expanding via BRSR/PSL	Solar Vendor Scheme; general green financing	PSL compliance

6.1.3 Objective 4: Utilization of Climate Finance Instruments in Real Property Transactions and Feasible Issues

Certified projects get concessional terms and support, but high certification costs (IGBC/GRIHA), low buyer premiums, and challenges in verification exist. Banks find it difficult to price physical risks (floods, heat stress) and track use of proceeds. HDFC-IFC H-DREAM Fund (2025) launch shows increasing use of blended finance for affordable green housing.

6.1.4 Objective 5: Current Regulatory Frameworks

RBI has published Climate Finance Directions (December 2025); SEBI has operationalized ESG Debt Securities Framework (June 2025); DEA has published Draft Climate Finance Taxonomy (May 2025). MoHUA encourages Eco Niwas Samhita and GRIHA for government buildings. State-level support is patchy. EU Taxonomy is still more prescriptive than the developing Indian framework.

6.1.5 Objective 6: Policy, Regulatory, and Implementation Loopholes

The following five major loopholes were identified (explained in Section 3.6):

Gap 1: Non-operationalized Climate Finance Taxonomy for buildings

Gap 2: No mandatory climate risk assessment in real estate lending

Gap 3: Inadequate enforcement of ECBC and green building regulations

Gap 4: Negligible private adaptation finance (<1% in buildings)

Gap 5: Inadequate state incentives and lack of a centralized MRV system

These loopholes constrain the extent and impact of climate finance in real estate.

6.1.6 Objective 7: Suggestions for Enhancement (Summary)

Suggestions have been elaborated in Section 7. Some of the major suggestions that have emerged from the analysis are as follows: finalization of the Climate Finance Taxonomy by mid-2026, risk-weighted incentives for green mortgages, and a standardized national incentive structure.

6.2 Overall Synthesis of Results

The secondary data available clearly indicates that the emerging climate finance policy and framework in India is robust, but the execution in the real estate segment is lagging. The green flows in the building segment are still well below the USD 1.4 trillion opportunity in 2030, and the real estate segment is getting only a marginal share of the green loans from banks.

6.3 Conclusion

The research explores the climate finance system in the Indian real estate sector, its execution through banking and regulatory systems, and the gaps in policies and operations that impact the integration of sustainable finance. Results validate that, despite advancements in green bonds, ESG-linked loans, and banking frameworks (particularly after the 2025 regulatory changes), there are still gaps in taxonomy finalization, risk analysis, enforcement of energy norms, adaptation finance, and uniformity in incentives. These gaps are impeding the efficient scaling-up of climate finance in the real estate sector. Filling these gaps is critical to align the sector with India's net-zero by 2070 goal and tap into the enormous green buildings sector. The research fulfills its purpose by presenting a distinct and informed view of the present scenario and areas for improvement through secondary data analysis.