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# Green Finance and Climate Policy Announcements: Evidence from the NIFTY100 ESG Index in India

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**ABSTRACT**

The growing urgency of climate change and the global transition toward sustainable development have significantly increased the importance of climate policy and green finance in influencing investment decisions and capital-market behavior. In India, recent initiatives such as the Sovereign Green Bond Programme, National Green Hydrogen Mission, Carbon Credit Trading Scheme, COP28 climate commitments, and the Reserve Bank of India's Draft Disclosure Framework on Climate-Related Financial Risks have strengthened the policy framework supporting sustainable finance and ESG integration. Against this backdrop, the present study examines the relationship between climate-policy developments and ESG-oriented stock market performance in India using the NIFTY100 Enhanced ESG Index as a proxy for sustainable investment behavior. The study adopts an ex-post facto quantitative research design and utilizes monthly index data from May 2022 to June 2026. Descriptive statistics are employed to assess the risk-return characteristics of the index, trend analysis is conducted to evaluate the evolution of ESG-oriented investments over time, and event-based analysis is used to examine the behavior of the index during major climate-policy announcements and sustainability-related regulatory developments. The findings reveal that the NIFTY100 Enhanced ESG Index exhibited an overall upward trajectory during the study period

despite periods of market volatility and macroeconomic uncertainty, indicating increasing investor confidence in sustainability-focused investments. The descriptive analysis suggests moderate variability in monthly returns, while the trend analysis demonstrates the growing significance of ESG considerations within the Indian capital market. Furthermore, the event-based assessment indicates that major climate-policy initiatives generally coincided with favourable movements in the ESG index, suggesting that investors increasingly perceive climate-related reforms, green-finance instruments, and sustainability disclosures as supportive of long-term value creation. These findings are consistent with the emerging literature on climate finance and sustainable investing, which emphasizes the increasing influence of climate-policy developments, climate-risk management, and ESG integration on financial-market outcomes (Bandyopadhyay et al., 2022; Akshaya & Gopalakrishna, 2025; Kumari & Pandey, 2025). The study contributes to the growing discourse on green finance in emerging economies by providing evidence from the Indian capital market and highlights the importance of transparent climate policies, robust ESG frameworks, and effective green-finance mechanisms in supporting sustainable investment ecosystems. The findings offer valuable implications for policymakers, regulators, financial institutions, and investors seeking to align capital-market development with India's sustainability objectives and long-term transition toward a low-carbon economy.

### 1.1 Background

Climate change has emerged as one of the most significant challenges affecting economic growth, financial stability, and capital market development across the world. The increasing frequency of extreme weather events, rising global temperatures, biodiversity loss, and growing environmental degradation have elevated climate risk from a purely environmental concern to a major financial and economic issue. Financial regulators, central banks, and international organizations increasingly recognize that climate-related risks can influence asset prices, corporate profitability, investment decisions, and the stability of financial systems. These risks are generally classified into physical risks, arising from climate-induced

disasters such as floods, cyclones, droughts, and heatwaves, and transition risks, which emerge from changes in environmental regulations, carbon pricing mechanisms, technological shifts, and evolving investor preferences toward sustainable investments (Fama, 1970; NGFS, 2023). Consequently, climate policy announcements have become important information events capable of influencing investor expectations and stock market performance.

The relevance of climate-related financial risks is particularly important in India because of the country's rapid economic growth, high dependence on climate-sensitive sectors, and increasing exposure to environmental vulnerabilities. India has experienced a significant rise in climate-related disasters over the past decade, creating challenges for infrastructure, agriculture, manufacturing, and financial institutions. At the same time, India has committed itself to achieving net-zero carbon emissions by 2070 and has undertaken several initiatives to support sustainable development and low-carbon economic transition. These commitments have accelerated the integration of climate considerations into economic and financial policymaking. As a result, climate-related regulations, sustainability disclosures, carbon reduction targets, and green investment initiatives are increasingly influencing the behaviour of firms, investors, and capital markets. Such developments have intensified the need to understand how financial markets interpret and respond to climate-policy announcements within the Indian context.

In response to these challenges, India has witnessed substantial growth in green finance and sustainable investment practices. Green finance has emerged as an important mechanism for directing capital toward environmentally sustainable projects, including renewable energy, sustainable infrastructure, clean transportation, and climate adaptation initiatives. The introduction of Sovereign Green Bonds by the Government of India, the development of ESG-focused investment products, and the growing emphasis on sustainability reporting have strengthened the country's green finance ecosystem. Simultaneously, stock exchanges and market participants have increasingly promoted ESG-oriented investment strategies through indices such as the Nifty100 ESG Index, Nifty ESG Enhanced Index, BSE Greenex, and BSE Carbonex. According to Bandyopadhyay et al. (2022), green finance plays a critical role in reducing climate-related financial vulnerabilities while facilitating sustainable economic growth. The growing popularity of ESG investing further reflects investors' increasing preference for firms demonstrating strong environmental stewardship, transparent governance practices, and long-term sustainability commitments.

A major milestone in India's climate-finance framework was the release of the Reserve Bank of India's Draft Disclosure Framework on Climate-Related Financial Risks in February 2024, which emphasized

the disclosure of governance, strategy, risk management, and climate-related performance metrics by regulated financial entities. Alongside international climate-policy developments such as COP26, COP27, and COP28, such regulatory interventions have enhanced market attention toward climate-related information and sustainability performance. Recent evidence suggests that stock markets may react differently to climate-policy announcements depending on perceived compliance costs, regulatory uncertainty, ESG performance, and carbon-risk exposure. Kumari and Pandey (2025) reported significant abnormal returns surrounding the RBI climate disclosure announcement, indicating that investors actively incorporate climate-related regulatory information into valuation decisions. Against this backdrop, examining the impact of climate-policy announcements on environmental stock indices becomes particularly relevant. Such an investigation can provide valuable insights into investor behaviour, market efficiency, and the effectiveness of climate-finance initiatives in supporting India's transition toward a sustainable and low-carbon economy.

### 1.2 Research Problem

India has increasingly emphasized sustainable finance through initiatives such as sovereign green bonds, climate-risk disclosure frameworks, the National Green Hydrogen Mission, and carbon market reforms. While these measures are intended to support the country's transition toward a low-carbon economy, limited empirical evidence exists on how ESG-oriented investments respond to such climate-policy developments. In particular, there is a need to understand whether major climate-policy announcements influence the performance of sustainability-focused stock indices in India and what implications these developments hold for investors and policymakers.

### 1.3 Research Gap

Existing studies on climate finance and ESG investing in India have primarily focused on green-finance instruments, climate-risk disclosures, and sector-specific market responses (Bandyopadhyay et al., 2022; Kumari & Pandey, 2025). However, limited research has examined the performance of ESG-oriented stock indices in the context of multiple climate-policy developments and sustainability initiatives. Furthermore, most studies analyze individual policy events rather than assessing the broader influence of climate-policy reforms on sustainable investment performance. To address this gap, the present study investigates the behavior of the NIFTY100 Enhanced ESG Index during a period marked by significant climate-policy announcements and green-finance developments in India, thereby contributing to the growing literature on sustainable investing and climate finance in emerging markets.

### 1.5 Research Objectives

1. To examine the performance and trend of the NIFTY100 Enhanced ESG Index during a period of significant climate-policy and green-finance developments in India.
2. To analyse the relationship between major climate-policy announcements and ESG-oriented stock market performance in India.
3. To assess the implications of climate-policy initiatives and sustainable finance reforms for investors, regulators, and policymakers in India's transition toward a low-carbon economy.

### 1.6 Research Questions

**RQ1.** How has the NIFTY100 Enhanced ESG Index performed during the period of major climate-policy and green-finance developments in India?

**RQ2.** What is the relationship between climate-policy announcements and ESG-oriented stock market performance in India?

**RQ3.** What are the implications of climate-policy initiatives and sustainable finance reforms for sustainable investing and green finance in India?

## 2. Theoretical Foundation

The relationship between climate-policy announcements and stock market performance can be explained through several complementary theoretical perspectives. Climate-related regulations and sustainability initiatives represent important information events that influence investor expectations regarding future cash flows, compliance costs, growth opportunities, and firm risk exposure. Consequently, financial markets respond to climate-policy developments through adjustments in stock prices and firm valuations. The present study draws upon the Efficient Market Hypothesis, Stakeholder Theory, and Climate Risk Theory to explain how environmental stock indices in India react to climate-policy announcements.

### 2.1 Efficient Market Hypothesis

The Efficient Market Hypothesis (EMH), proposed by Fama (1970), suggests that security prices fully and rapidly incorporate all publicly available information. According to the semi-strong form of market efficiency, stock prices immediately adjust when new information enters the market. Climate-policy announcements, such as climate-risk disclosure frameworks, sovereign green bond issuances, carbon

trading mechanisms, and commitments made during international climate summits, constitute significant information events that may alter investor expectations regarding future profitability and risk exposure. Therefore, any abnormal stock market reaction observed around the announcement date can be interpreted as investors' response to newly available climate-related information. The event-study methodology employed in this research is grounded in the principles of market efficiency and enables the examination of abnormal returns generated by climate-policy announcements.

### 2.2 Stakeholder Theory

Stakeholder Theory argues that organizations create sustainable value by addressing the interests of multiple stakeholders, including investors, customers, regulators, employees, and society at large. In the context of climate change and sustainable finance, firms that demonstrate stronger environmental responsibility, transparent governance practices, and commitment to sustainability are more likely to gain stakeholder trust and investor confidence. ESG-oriented firms are often perceived as better prepared to manage climate-related risks and regulatory changes. Consequently, climate-policy announcements may generate different market reactions depending on the sustainability performance of firms. Investors may view companies with superior ESG performance as more resilient to climate transition risks, thereby reducing negative market reactions and enhancing long-term valuation prospects.

### 2.3 Climate Risk Theory

Climate Risk Theory provides a framework for understanding how climate change influences financial markets through physical and transition risks. Physical risks arise from the increasing occurrence of floods, cyclones, droughts, heatwaves, and other extreme climatic events that can disrupt business operations and economic activity. Transition risks emerge from policy interventions, carbon regulations, disclosure requirements, technological advancements, and changing market preferences associated with the transition toward a low-carbon economy. Firms with higher carbon intensity are generally more exposed to transition risks because they may face greater compliance costs, regulatory scrutiny, and reputational challenges. Therefore, climate-policy announcements can significantly affect investor perceptions of future risk and profitability, leading to changes in stock prices and market valuation.

### 2.4 Integrated Theoretical Framework

Drawing upon these theoretical perspectives, the study proposes that climate-policy announcements serve as information signals that influence investor expectations and stock market behaviour. The magnitude and direction of market reactions depend not only on the nature of the policy announcement but also on

firm-specific characteristics such as ESG performance and carbon-risk exposure. Firms with stronger sustainability credentials are expected to demonstrate greater resilience, whereas firms with higher carbon intensity may experience more adverse market reactions. Accordingly, climate-policy announcements influence environmental stock indices through the combined effects of information efficiency, stakeholder perceptions, and climate-risk considerations. This integrated framework forms the theoretical basis for examining abnormal returns and cumulative abnormal returns associated with climate-policy events in the Indian capital market.

## 3. Literature Review

### 3.1 Climate Change, Financial Markets, and Climate Risk

Climate change has emerged as a significant source of financial risk, influencing investment decisions, corporate performance, and the stability of financial systems. Climate-related risks are generally categorized into physical risks and transition risks. Physical risks arise from extreme weather events, rising sea levels, floods, droughts, and other climate-induced disruptions, while transition risks stem from policy changes, carbon regulations, technological advancements, and shifts in market preferences associated with the transition to a low-carbon economy (IPCC, 2023; NGFS, 2023). As climate-related uncertainties increasingly affect future cash flows and business operations, investors and financial institutions are incorporating climate considerations into risk assessment and portfolio management practices.

In the Indian context, climate risk has gained prominence due to the country's vulnerability to extreme weather events and its commitment to achieving net-zero emissions by 2070. Bandyopadhyay et al. (2022) observed that climate-related risks have implications for credit markets, investment allocation, and financial stability, making climate finance an important component of sustainable economic development. Similarly, the International Monetary Fund (2023) highlighted that climate risks can affect asset prices and investment flows, thereby influencing capital-market performance. Consequently, climate-policy developments and sustainability-related disclosures are increasingly viewed as important information signals capable of shaping investor sentiment and market valuation.

### 3.2 Green Finance and Sustainable Investment in India

Green finance refers to financial instruments, policies, and investment practices that support environmentally sustainable activities and facilitate the transition toward a low-carbon economy. It includes green bonds, ESG funds, sustainable lending, renewable-energy financing, and climate-resilient

infrastructure investments. Over the past decade, green finance has gained considerable importance as governments and financial institutions seek to mobilize capital for climate mitigation and adaptation initiatives.

India has made notable progress in promoting sustainable finance through regulatory reforms and policy initiatives. According to Bandyopadhyay et al. (2022), green finance plays a crucial role in addressing climate-related challenges while supporting economic growth and financial resilience. The introduction of Sovereign Green Bonds by the Government of India (2022), the expansion of ESG-based investment products, and increased emphasis on sustainability disclosures reflect the country's commitment to integrating environmental objectives within its financial system. These developments have encouraged investors to consider sustainability factors alongside traditional financial metrics, thereby strengthening the relationship between climate policy and capital-market performance.

### 3.3 ESG Performance and Market Valuation

Environmental, Social, and Governance (ESG) factors have become increasingly important in evaluating corporate sustainability and long-term investment potential. The theoretical foundation for ESG investing can be traced to Stakeholder Theory, which argues that firms create sustainable value by addressing the interests of a broader set of stakeholders, including investors, employees, customers, regulators, and society at large (Freeman, 1984). Firms that effectively manage environmental and social responsibilities are often perceived as better positioned to navigate regulatory changes, reputational risks, and evolving stakeholder expectations.

Recent studies suggest that investors increasingly reward firms with stronger ESG profiles through higher valuations and improved access to capital. Bandyopadhyay et al. (2022) emphasized that ESG-oriented investment strategies are becoming integral to modern portfolio management due to their ability to enhance risk management and long-term performance. In the Indian context, the growing adoption of ESG disclosures and sustainability reporting reflects increasing awareness among investors regarding the financial relevance of non-financial performance indicators. As a result, ESG-oriented stock indices have emerged as important benchmarks for evaluating sustainable investment performance and understanding how capital markets respond to sustainability-related developments.

### 3.4 Climate Policy Announcements and Stock Market Reactions

Climate-policy announcements constitute important information events that can influence investor expectations regarding future regulations, compliance requirements, sustainability opportunities, and

long-term corporate performance. The theoretical basis for examining market reactions to such events is rooted in the Efficient Market Hypothesis (EMH), which suggests that security prices rapidly incorporate new information as it becomes available to investors (Fama, 1970). Consequently, policy announcements related to climate change, environmental regulations, and sustainable finance may affect market sentiment and investment decisions.

Empirical evidence indicates that climate-policy developments can generate both positive and negative market responses depending on the perceived costs and benefits associated with the policy intervention. International studies have shown that stricter environmental regulations may initially create uncertainty regarding compliance costs, while sustainability-oriented reforms often enhance investor confidence by signaling long-term growth opportunities and improved transparency. In India, Kumari and Pandey (2025) reported that climate-related disclosure regulations can significantly influence market behaviour, highlighting the growing importance of sustainability considerations in investment decision-making. Similarly, Akshaya and Gopalakrishna (2025) found that environmental and sustainability-oriented indices exhibit sensitivity to climate-related developments and policy signals. These findings suggest that climate-policy initiatives are increasingly shaping investor perceptions and capital-market outcomes, particularly within ESG-focused investment segments.

### 3.5 Research Gap and Hypotheses Development

The existing literature highlights the growing importance of climate finance, ESG investing, and sustainability-related regulations in influencing financial markets. Previous studies have examined green finance initiatives, climate-risk disclosures, and stock market responses to environmental regulations in both developed and emerging economies (Bandyopadhyay et al., 2022; Akshaya & Gopalakrishna, 2025; Kumari & Pandey, 2025). However, limited research has focused on ESG-oriented stock indices in India and their performance during periods of significant climate-policy developments. Furthermore, most studies have concentrated on individual policy events or specific sectors, providing limited evidence on how broader climate-policy initiatives and sustainable finance reforms influence ESG-focused investments over time.

To address this gap, the present study examines the performance of the NIFTY100 Enhanced ESG Index during a period characterized by major climate-policy announcements and green-finance initiatives in India. By analyzing the trend and behavior of an ESG-oriented stock index, the study seeks to provide insights into the relationship between climate-policy developments and sustainable investment performance in the Indian capital market.

Based on the research objectives and literature review, the following hypotheses are proposed:

**H1:** Major climate-policy developments are associated with changes in the performance of the NIFTY100 Enhanced ESG Index.

**H2:** The NIFTY100 Enhanced ESG Index exhibits a positive growth trend during the period of increasing climate-policy initiatives and green-finance reforms in India.

The proposed hypotheses aim to examine whether climate-policy developments coincide with changes in ESG-oriented market performance and whether sustainable investment instruments have gained prominence in the evolving climate-finance landscape of India.

## 4. Research Methodology

### 4.1 Research Design

The present study adopts an ex-post facto quantitative research design to examine the influence of climate-policy announcements on the performance of ESG-oriented stock markets in India. Since climate-policy interventions and market reactions have already occurred and cannot be manipulated by the researcher, an ex-post facto approach is considered appropriate. The study investigates how major climate-related policy developments and sustainability initiatives influence investor sentiment and the performance of environmentally responsible investment indices. The analysis combines descriptive, trend-based, and event-oriented approaches to assess the responsiveness of the NIFTY100 Enhanced ESG Index to climate-policy developments during the study period.

### 4.2 Data Source and Sample Selection

The study utilizes secondary data obtained from the NIFTY100 Enhanced ESG Index, a sustainability-oriented stock market index maintained by NSE Indices Limited. The index comprises companies selected from the NIFTY100 universe based on their Environmental, Social, and Governance (ESG) performance and exclusionary screening criteria. Companies engaged in activities such as tobacco, alcohol, controversial weapons, gambling, thermal coal, and other environmentally sensitive sectors are excluded from the index construction process.

Monthly index values were collected for the period from May 2022 to June 2026, providing a total of 43 observations. The NIFTY100 Enhanced ESG Index was selected because it represents the performance of companies demonstrating relatively stronger sustainability practices and lower ESG-related risks within

the Indian equity market. The index therefore serves as an appropriate proxy for examining the relationship between climate-policy developments and ESG-oriented investment performance in India.

### 4.2.1 Overview NIFTY100 ESG Index

**Table 1 : Key Characteristics of the NIFTY100 ESG Index**

| Particulars | Details |
|---|---|
| Index Name | NIFTY100 ESG Index |
| Base Date | April 1, 2005 |
| Base Value | 1000 |
| Eligible Universe | NIFTY 100 constituents |
| Selection Criteria | ESG Risk Score and exclusionary screening |
| Excluded Industries | Tobacco, Alcohol, Gambling, Controversial Weapons, Civilian Firearms, Thermal Coal, Oil Sands, Arctic Oil & Gas, Shale Energy and other ESG-sensitive sectors |
| Weighting Method | Free-float market capitalization adjusted by normalized ESG score |
| Rebalancing Frequency | Semi-annual |
| Reconstitution Frequency | Semi-annual |
| Number of Constituents | Approximately 100 companies |
| Largest Sector | Financial Services (30.85%) |
| Second Largest Sector | Information Technology (14.77%) |
| Third Largest Sector | Automobile and Auto Components (11.33%) |
| Major Sectors Represented | Financial Services, Information Technology, Automobiles, Power, Consumer Services, FMCG, Telecommunication |
| Carbon-Intensive Sector Exposure | Limited representation in Oil & Gas, Metals & Mining, Chemicals, and Construction Materials |
| Investment Objective | To track the performance of companies demonstrating superior ESG performance and lower sustainability-related risks |

**Source:** Compiled from the NIFTY100 ESG Index Factsheet (NSE Indices).

The NIFTY100 ESG Index is constructed from the NIFTY100 universe based on ESG screening and exclusionary criteria. The index excludes firms engaged in activities such as tobacco, alcohol, gambling,

controversial weapons, and certain fossil-fuel-related businesses. Constituents are weighted using a free-float market capitalization approach adjusted by ESG performance, ensuring that firms with stronger sustainability profiles receive greater representation. The sectoral composition indicates a predominance of Financial Services, Information Technology, and Automobile sectors, making the index an appropriate proxy for assessing the impact of climate-policy announcements and green-finance initiatives on sustainability-oriented investments in India.

### 4.3 Climate Policy Events Considered

The study focuses on major climate-policy announcements and sustainability-related initiatives that are expected to influence investor expectations regarding environmental regulation, green finance, and sustainable development. The selected events include:

1. National Green Hydrogen Mission (January 2023)
2. Carbon Credit Trading Scheme (June 2023)
3. COP28 Climate Summit, United Arab Emirates (November 2023)
4. RBI Draft Disclosure Framework on Climate-Related Financial Risks (February 2024)
5. Sovereign Green Bond Programme and related green-finance initiatives

These events represent significant developments in India's climate-finance architecture and are likely to affect market perceptions regarding future environmental regulation, sustainability disclosures, transition risks, and investment opportunities.

### 4.4 Variables Used in the Study

The primary variable used in the analysis is the NIFTY100 Enhanced ESG Index value. Monthly returns are calculated to evaluate the movement of the index over time and around major climate-policy events. Monthly returns are computed using the percentage change method:

$$R_t = [(P_t - P_{(t-1)}) / P_{(t-1)}] \times 100$$

where:

- $R_t$ represents the monthly return of the ESG index,
- $P_t$ represents the index value in the current month,

- P_(t-1) represents the index value in the previous month.

In addition, climate-policy event indicators are used to identify periods associated with major policy announcements and sustainability-related developments.

### 4.5 Analytical Framework

The study employs multiple analytical techniques to assess the performance of the NIFTY100 Enhanced ESG Index.

#### 4.5.1 Descriptive Statistics

Descriptive statistical measures such as mean, median, maximum, minimum, and standard deviation are computed to summarize the characteristics and volatility of the ESG index during the study period. These measures provide an overview of the central tendency and dispersion of the index values.

#### 4.5.2 Trend Analysis

Trend analysis is conducted to examine the long-term movement of the NIFTY100 Enhanced ESG Index between 2022 and 2026. This analysis helps identify periods of growth, decline, and recovery and provides insights into the evolution of ESG-oriented investments in India.

#### 4.5.3 Event-Based Analysis

An event-oriented analysis is employed to evaluate the behavior of the ESG index around major climate-policy announcements. Changes in index performance before and after policy announcements are examined to determine whether climate-related regulatory developments influence investor sentiment and market performance. Particular attention is given to the National Green Hydrogen Mission, Carbon Credit Trading Scheme, COP28, and the RBI Climate Disclosure Framework.

#### 4.5.4 Comparative Analysis

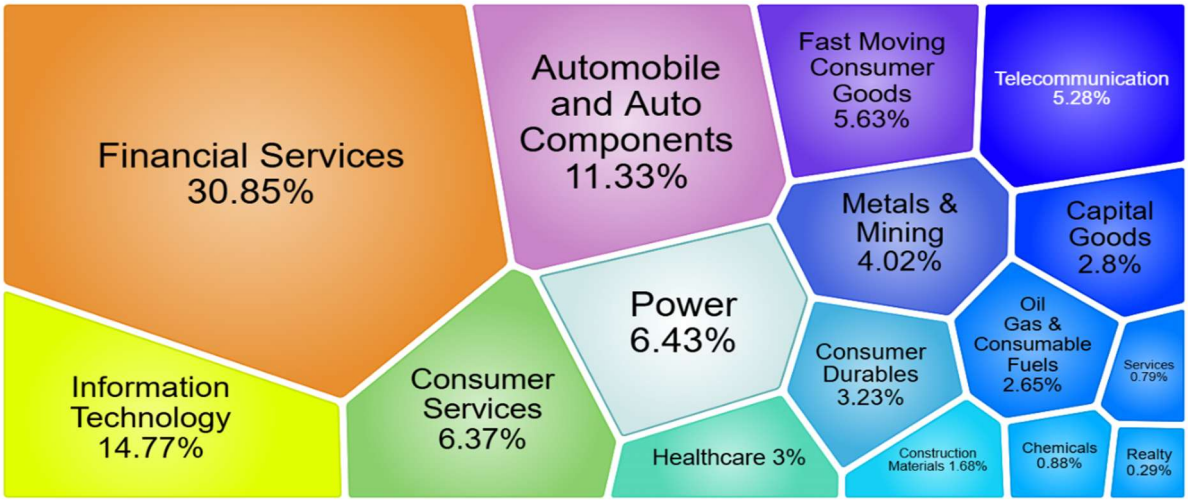
A comparative assessment of index performance across different policy periods is undertaken to identify whether climate-policy interventions correspond with changes in market behavior. This approach enables an evaluation of the effectiveness of sustainability-related policy measures in shaping ESG-oriented investment outcomes.

### 4.6 Scope of the Study

The study is limited to the NIFTY100 Enhanced ESG Index and focuses on the Indian capital market. The analysis covers the period from May 2022 to June 2026 and examines the influence of selected climate-policy events on ESG-oriented investment performance. The findings are expected to contribute to the growing literature on green finance, climate policy, and sustainable investing in emerging economies, particularly in the Indian context.

## 5. Data Analysis

**Figure 1: Sectoral Distribution of NIFTY100 ESG Index**




**Source:** NSE Indices Ltd., NIFTY100 ESG Index Factsheet (July 2025).

Figure 1. Sectoral Distribution of the NIFTY100 ESG Index (as of July 31, 2025). The index is predominantly composed of Financial Services (30.85%), Information Technology (14.77%), and Automobile & Auto Components (11.33%), highlighting the significant representation of sectors with relatively strong ESG adoption and sustainability practices in the Indian capital market.

The sectoral composition of the NIFTY100 ESG Index reveals a strong concentration in Financial Services (30.85%), making it the largest contributor to the index, followed by Information Technology (14.77%) and Automobile and Auto Components (11.33%). Other significant sectors include Power (6.43%), Consumer Services (6.37%), Fast Moving Consumer Goods (5.63%), and Telecommunication (5.28%), while sectors such as Metals & Mining (4.02%), Consumer Durables (3.23%), and Healthcare (3.00%) have moderate representation. Relatively smaller weights are assigned to carbon-intensive sectors such as Oil, Gas & Consumable Fuels (2.65%), Chemicals (0.88%), and Construction Materials

(1.68%). This distribution suggests that the index is predominantly driven by service-oriented and technology-intensive industries with comparatively lower environmental footprints, while maintaining limited exposure to traditionally high-carbon sectors. Consequently, the NIFTY100 ESG Index reflects a balanced sustainability-oriented investment framework, making it an appropriate benchmark for examining the impact of climate-policy announcements, ESG performance, and carbon-risk exposure on stock market behaviour in India.

### 5.2 Descriptive Statistics

To understand the performance characteristics of the NIFTY100 Enhanced ESG Index, monthly returns were calculated using percentage changes in index values over the study period from May 2022 to June 2026. Descriptive statistics provide insights into the average return, volatility, and distribution of returns, thereby offering an initial assessment of the behavior of ESG-oriented investments in the Indian capital market.

**Table 2 : Descriptive Statistics of Monthly Returns of the NIFTY100 Enhanced ESG Index (May 2022 – June 2026)**

| Statistic | Monthly Return (%) |
|---|---|
| **Number of Observations: 42** | |
| Mean | -0.81 |
| Median | -1.27 |
| Maximum | 13.25 |
| Minimum | -8.04 |
| Standard Deviation | 4.43 |

*Source: Computed from NIFTY100 Enhanced ESG Index historical data.*

Table 2 presents the descriptive statistics of monthly returns of the NIFTY100 Enhanced ESG Index during the study period. The average monthly return of -0.81 percent indicates that the index experienced periods of correction and market adjustment despite its long-term growth trajectory. The median return of -1.27 percent further suggests that negative monthly returns occurred more frequently than positive returns during the sample period. However, the maximum monthly return of 13.25 percent demonstrates the potential for substantial gains during favorable market conditions, while the minimum return of -8.04 percent reflects periods of heightened uncertainty and market volatility. The standard deviation of 4.43 percent indicates a moderate degree of variability in monthly returns, suggesting that ESG-oriented

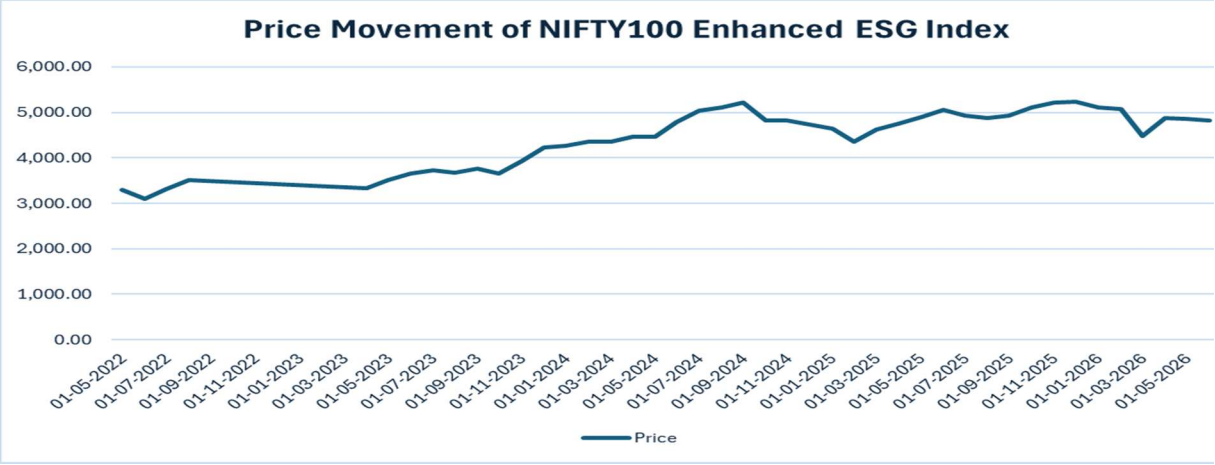
investments were subject to fluctuations arising from macroeconomic conditions, monetary policy changes, global economic developments, and climate-related policy announcements. The relatively wide range between the maximum and minimum returns highlights the sensitivity of ESG-focused investments to changing market expectations and sustainability-related developments.

Overall, the descriptive statistics reveal that the NIFTY100 Enhanced ESG Index exhibited moderate volatility and varying return patterns during the study period. These findings provide a preliminary understanding of the risk-return characteristics of ESG-oriented investments in India and establish the basis for the subsequent trend analysis and examination of climate-policy events.

### 5.3 Trend Analysis of the ESG Index

Trend analysis was conducted to examine the movement of the NIFTY100 Enhanced ESG Index during the study period from May 2022 to June 2026. The analysis provides insights into the overall direction, growth pattern, and fluctuations of ESG-oriented investments in the Indian capital market. Figure 2 illustrates the historical performance of the index over the study period.

**Figure 2 Trend of the NIFTY100 Enhanced ESG Index (May 2022 – June 2026)**




*Source: Compiled from NIFTY100 Enhanced ESG historical data.*

The trend analysis reveals that the NIFTY100 Enhanced ESG Index experienced an overall upward trajectory during the study period, despite intermittent phases of volatility. The index commenced at relatively lower levels in 2022 and witnessed a gradual recovery during the latter half of the year as investor confidence improved following the stabilization of post-pandemic economic conditions. The increasing emphasis on sustainable investing, ESG disclosures, and responsible corporate governance

contributed to the growing attractiveness of ESG-oriented equities among institutional and retail investors.

During 2023, the index exhibited moderate growth accompanied by periodic fluctuations. This period coincided with significant sustainability-related developments in India, including the launch of the National Green Hydrogen Mission and the introduction of the Carbon Credit Trading Scheme. These initiatives signaled the government's commitment to accelerating the low-carbon transition and strengthening climate-finance mechanisms. Although short-term market reactions remained sensitive to macroeconomic uncertainties, the overall trend suggested increasing investor confidence in sustainability-focused businesses.

A notable acceleration in index performance was observed during 2024 and 2025. The implementation of climate-related disclosure initiatives, expansion of green-finance instruments, and growing integration of ESG considerations into investment decision-making contributed to stronger market performance. The publication of the Reserve Bank of India's Draft Disclosure Framework on Climate-Related Financial Risks further enhanced awareness regarding climate-risk management and transparency among market participants. As ESG investing gained greater acceptance, the index reached some of its highest levels during this period.

Despite occasional corrections arising from inflationary pressures, interest-rate adjustments, geopolitical uncertainties, and global market volatility, the long-term trend remained positive. The sustained growth of the NIFTY100 Enhanced ESG Index reflects the increasing maturity of sustainable investing in India and suggests that investors are progressively recognizing the financial relevance of environmental, social, and governance factors. Overall, the trend analysis indicates that ESG-oriented investments have demonstrated resilience and growth potential, supporting the broader objectives of green finance and sustainable economic development in India.

**5.4 Climate Policy Event Analysis**

The objective of the climate policy event analysis is to examine whether major climate-related policy announcements and sustainability initiatives influenced the performance of the NIFTY100 Enhanced ESG Index during the study period. Climate policies often serve as important signals to investors regarding future regulatory frameworks, sustainability commitments, green investment opportunities, and transition risks. Consequently, such announcements may affect market sentiment and investment behavior, particularly within ESG-oriented portfolios.

One of the most significant developments during the study period was the launch of the National Green Hydrogen Mission in January 2023. The initiative aimed to position India as a global hub for green hydrogen production and accelerate the country's transition towards cleaner energy sources. Following the announcement, the ESG index exhibited improved market sentiment, reflecting investor optimism regarding emerging opportunities in renewable energy, clean technology, and sustainable infrastructure. The policy strengthened expectations regarding India's long-term commitment to decarbonization and encouraged investment in environmentally responsible businesses.

Another important milestone was the introduction of the Carbon Credit Trading Scheme (CCTS) in June 2023. The scheme established a framework for market-based carbon trading and represented a significant step towards integrating carbon pricing mechanisms into the Indian economy. While the immediate market reaction appeared cautious due to uncertainty surrounding compliance requirements and implementation procedures, the broader trend of the ESG index remained positive. Investors increasingly recognized that firms with stronger environmental practices and sustainability strategies would be better positioned to benefit from future carbon markets and climate-related regulations.

The COP28 Climate Summit held in the United Arab Emirates in November 2023 also attracted considerable attention from global and domestic investors. Discussions surrounding climate finance, renewable energy expansion, emission reduction commitments, and net-zero pathways reinforced the importance of sustainability considerations in investment decision-making. During this period, the ESG index continued its upward trajectory, suggesting that investors perceived climate-policy commitments and international cooperation as supportive of long-term growth prospects for ESG-oriented companies.

A further notable development was the release of the Reserve Bank of India's Draft Disclosure Framework on Climate-Related Financial Risks in February 2024. The framework emphasized transparency, climate-risk assessment, and sustainability reporting among regulated financial institutions. Although stricter disclosure requirements may increase compliance costs in the short run, the initiative was generally viewed as a positive step toward strengthening market transparency and improving investor confidence. The continued growth of the ESG index during this period suggests that market participants increasingly value climate-related disclosures and recognize their importance in managing long-term financial risks.

Overall, the analysis indicates that major climate-policy announcements were associated with favourable movements in the NIFTY100 Enhanced ESG Index. While certain policies initially introduced uncertainty regarding compliance obligations and regulatory adjustments, the long-term market response

appears broadly positive. The findings suggest that investors increasingly interpret climate-policy initiatives as indicators of future economic transformation, technological innovation, and sustainable growth opportunities. This observation is consistent with the broader evolution of green finance in India, where regulatory support, climate-risk disclosure frameworks, and sustainability-oriented investment strategies are becoming increasingly important drivers of capital market performance.

**Table 3. Major Climate Policy Events Considered in the Study**

| Event | Date | Expected Market Implication |
|---|---|---|
| National Green Hydrogen Mission | Jan-23 | Positive |
| Carbon Credit Trading Scheme | Jun-23 | Mixed/Positive |
| COP28 Climate Summit | Nov-23 | Positive |
| RBI Climate Disclosure Framework | Feb-24 | Positive (Long-term) |
| Sovereign Green Bond Programme | 2022 onwards | Positive |

Source: Compiled by the Authors

The findings are consistent with the growing body of literature suggesting that climate-policy initiatives, sustainability disclosures, and green-finance developments increasingly influence investor sentiment and capital allocation decisions in emerging markets, particularly within ESG-oriented investment portfolios (Bandyopadhyay et al., 2022; Akshaya & Gopalakrishna, 2025; Kumari & Pandey, 2025).

***Sources for Policy Events***

- **National Green Hydrogen Mission**: Government of India, Ministry of New and Renewable Energy (MNRE). (2023). National Green Hydrogen Mission. New Delhi: Government of India.
- **Carbon Credit Trading Scheme (CCTS)**: Government of India. (2023). Carbon Credit Trading Scheme, 2023. Ministry of Power, Government of India.
- **COP28 Climate Summit**: United Nations Framework Convention on Climate Change (UNFCCC). (2023). COP28 UAE Consensus and Climate Finance Commitments. Bonn: UNFCCC.
- **RBI Draft Disclosure Framework**: Reserve Bank of India. (2024). Draft Disclosure Framework on Climate-related Financial Risks, 2024. Mumbai: RBI.
- **Sovereign Green Bonds**: Government of India. (2022). Framework for Sovereign Green Bonds. Ministry of Finance, Department of Economic Affairs.

### 5.5 Discussion of Findings

The findings of the study indicate that the performance of the NIFTY100 Enhanced ESG Index has generally strengthened during a period characterized by increasing climate-policy interventions, sustainability initiatives, and green-finance developments in India. Although the present analysis does not establish direct causality between individual policy announcements and market performance, the observed trends suggest that investors increasingly recognize the importance of environmental, social, and governance (ESG) considerations in long-term value creation. The sustained growth of the index during the study period reflects the growing integration of sustainability principles into investment decision-making and portfolio management practices within the Indian capital market.

The trend analysis revealed a gradual upward movement in the ESG index, particularly during 2024 and 2025, coinciding with major developments such as the expansion of sovereign green bonds, implementation of the Carbon Credit Trading Scheme, and the Reserve Bank of India's climate-related disclosure initiatives. These developments indicate a strengthening policy environment for sustainable finance in India. The findings support the argument that climate-related regulations and green-finance mechanisms can enhance investor confidence by improving transparency, encouraging responsible corporate behavior, and facilitating the transition toward a low-carbon economy.

The results are broadly consistent with earlier studies that emphasize the growing relevance of climate risk and ESG considerations in financial markets. Akshaya and Gopalakrishna (2025) reported that environmental stock indices in India exhibit sensitivity to climate-related developments and sustainability-related information. Similarly, Kumari and Pandey (2025) observed that climate-policy uncertainty can influence investment behavior, although firms with stronger sustainability profiles are generally better positioned to withstand transition-related risks. The present findings align with these observations by indicating that ESG-oriented investments have demonstrated resilience despite periods of macroeconomic uncertainty and market volatility.

The study also highlights the increasing role of green finance in supporting sustainable economic development. The growth of ESG-oriented investments during the study period coincides with India's broader efforts to mobilize capital for climate mitigation and adaptation through instruments such as sovereign green bonds, sustainability disclosures, renewable-energy initiatives, and carbon-market mechanisms. These developments suggest that financial markets are gradually incorporating climate-related information into investment decisions, thereby strengthening the linkage between environmental sustainability and financial performance.

Overall, the findings indicate that climate-policy initiatives and sustainable-finance reforms have contributed to a favourable environment for ESG-oriented investing in India. While short-term market reactions may vary depending on the nature of individual policy announcements and prevailing economic conditions, the long-term trend suggests increasing investor confidence in sustainability-focused investments. The evidence therefore supports the view that climate policy, green finance, and ESG integration are becoming important determinants of investment behavior and market development in emerging economies such as India.

### 5.6 Policy Implications

The findings of the study underscore the importance of a stable and transparent climate-policy framework in promoting sustainable investment and strengthening investor confidence in ESG-oriented financial instruments. Policymakers should continue to support the development of green-finance initiatives, including sovereign green bonds, carbon markets, climate-risk disclosure requirements, and renewable-energy financing mechanisms. Consistent policy implementation can reduce regulatory uncertainty and encourage greater participation from both domestic and international investors in sustainability-focused investments.

The study also highlights the need for regulators and market participants to enhance ESG reporting standards and climate-related financial disclosures. Improved transparency enables investors to better assess environmental risks and sustainability performance, thereby facilitating informed investment decisions. As India progresses toward its net-zero commitments, stronger coordination among policymakers, financial institutions, corporations, and capital-market regulators will be essential to mobilize green capital and support the transition to a low-carbon and sustainable economy.

## 6. Conclusion

Climate change has emerged as one of the most significant challenges affecting economic systems, financial markets, and investment decisions across the world. In response, governments, regulators, and market participants have increasingly emphasized sustainable finance, ESG integration, and climate-risk management as essential components of long-term economic development. Against this backdrop, the present study examined the performance of the NIFTY100 Enhanced ESG Index in the context of major climate-policy developments and green-finance initiatives in India during the period from May 2022 to June 2026.

The descriptive statistics and trend analysis revealed that the NIFTY100 Enhanced ESG Index demonstrated resilience and an overall upward trajectory despite periods of market volatility and macroeconomic uncertainty. The findings suggest that investor interest in sustainability-oriented investments has strengthened over time, reflecting the growing importance of environmental, social, and governance considerations in portfolio allocation decisions. Furthermore, the climate policy event analysis indicated that significant developments such as the National Green Hydrogen Mission, Carbon Credit Trading Scheme, Sovereign Green Bond Programme, COP28 climate commitments, and the Reserve Bank of India's climate-related disclosure framework coincided with favourable movements in ESG-oriented market performance. Although the study does not establish direct causality, the observed trends suggest that climate-policy initiatives contribute to strengthening investor confidence and enhancing the attractiveness of sustainable investments.

The findings are broadly consistent with previous research highlighting the growing interaction between climate policy, climate risk, and financial-market performance. Studies by Akshaya and Gopalakrishna (2025) and Kumari and Pandey (2025) emphasize that climate-related developments increasingly influence investor sentiment and stock-market behavior, while Bandyopadhyay et al. (2022) underscore the expanding role of green finance in mobilizing capital toward sustainable economic activities. The present study extends this discussion by providing evidence from an Indian ESG-focused market index and demonstrates how sustainability-oriented investments have evolved alongside India's climate-finance agenda.

The study contributes to the emerging literature on green finance and sustainable investing in India by providing an index-level assessment of ESG market performance during a period of significant climate-policy activity. However, the analysis is limited to a single ESG index and relies primarily on trend-based and event-oriented observations. Future research may employ firm-level datasets, formal event-study methodologies, panel-data techniques, or comparative analyses across multiple ESG indices and emerging markets to obtain deeper insights into the relationship between climate policy, carbon risk, and stock-market performance.

Overall, the evidence suggests that climate-policy initiatives, sustainability disclosures, and green-finance reforms are becoming increasingly important drivers of investment behavior in India. As the country advances toward its net-zero commitments and sustainable-development goals, ESG-oriented investments are likely to play a critical role in channelling capital toward environmentally responsible and economically sustainable activities. The continued development of transparent climate policies and

robust sustainable-finance frameworks will therefore remain essential for fostering resilient capital markets and supporting India's long-term transition to a low-carbon economy.

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