# ESG Mutual Funds in India: Financial Returns, Sustainability and Investor Behaviour

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## Abstract

Environmental, Social, and Governance (ESG) investing has emerged as a prominent investment approach in global financial markets, reflecting growing investor interest in sustainable and responsible investing. In India, ESG mutual funds have gained increasing attention; however, evidence regarding their financial performance, sustainability outcomes, and investor behaviour remains limited. This study provides a multidimensional evaluation of ESG mutual funds in India through financial performance analysis, sustainability assessment, and investor behaviour analysis. The study adopts a quantitative research design using both primary and secondary data. Secondary data covering the period 2018–2024 were collected from AMFI, Value Research, Morningstar, mutual fund factsheets, sustainability reports, and benchmark indices. Financial performance was evaluated using the Sharpe Ratio, Treynor Ratio, Jensen's Alpha, Standard Deviation, and inferential statistical analysis. Primary data were collected through a structured survey of 435 retail investors. The findings indicate that ESG mutual funds generated competitive risk-adjusted returns and demonstrated resilience across different market cycles. However, inferential statistical analysis showed that return differences between ESG mutual funds and benchmark indices were not statistically significant, indicating broadly comparable performance. The sustainability assessment revealed strong ESG alignment among portfolio holdings, but limited evidence of measurable sustainability impact due to the absence of standardized impact metrics. The behavioural analysis showed growing investor interest in ESG investing, particularly among younger investors, although awareness, trust, and adoption levels remain relatively moderate. The study contributes to the literature on sustainable finance by providing an integrated assessment of ESG mutual funds in India and offering implications for investors, regulators, and asset managers.

## Keywords

ESG Mutual funds, Sustainable finance, Risk-adjusted performance, Sustainability outcomes, Investor behaviour, ESG investing, and India.

## 1. Introduction

The recent global developments have resulted in a change in investor, preference from high return- based investing to sustainable and responsible investing leading to an exponential increase in the demand of ESG-based mutual funds. A phenomenon that started as an effort to invest socially and responsibly (SRI) has now been transformed into ESG Investing, which integrates traditional financial analysis with environmental responsibility, social impact, and corporate governance factors demonstrating a broader shift towards sustainable finance. Worldwide regulatory bodies, Institutional investors and asset managers have promoted ESG principles to ensure study long-term value creation and enhanced corporate accountability.

## 2. Objectives of the Study

This study offers much-needed attention to ESG investing in emerging markets, through structured evaluation of ESG mutual funds in India. Study fills important gaps in the literature by examining both long-term and risk-adjusted performance, alignment with measurable sustainability outcomes, but also examining aspects of investor behaviour which are almost completely non-existent in the literature. The study's policy relevance is situated against the background of political and regulatory shifting contexts, such as SEBI's BRSR mandate and recent rise in investor interest in the area of sustainable finance, as the research considers the actual impact of ESG-labelled funds and has implications for investors and fund managers concerned with balancing return and ethical investing. By conducting original and multidimensional analysis, this study enhances knowledge regarding the performance of ESG mutual funds in India, not only on financial dimensions, but on other dimensions related to ESG/impact investing across a sustainability agenda during the study period.
The study seeks to achieve the following objectives:

**2.1.** To evaluate the long-term and risk-adjusted performance of selected ESG mutual funds in India across different market cycles.

**2.2.** To assess the extent to which ESG mutual funds contribute to measurable sustainability outcomes through the ESG characteristics and sustainability initiatives of their portfolio-holdings.

**2.3.** To examine investor awareness, perceptions, trust, and behavioural intentions towards ESG mutual funds in India.

## 3. Review of the Literature

Today, environmental, social, and governance investing has become a main stream investment approach in the global financial system. It has developed from traditional SRI models. (Sherwood MW & Pollard J, 2018) The use of ESG parameters in investment decisions became more popular after initiatives such as the UNPRI of 2006 and the Paris Agreement of 2015 were launched. In India, ESG investing received an extra push from the introduction of Corporate Social Responsibility rules under the Companies Act, 2013, and SEBI's requirement for Business Responsibility and Sustainability Reporting for the top 1000 listed companies by market capitalization.

**3.1. Evolution of ESG Mutual Funds in India:** The Indian mutual fund industry has seen a sea change with the introduction of ESG-themed funds. Although it is still at a nascent stage compared to developed markets, ESG investing has started gaining traction in India since 2018, especially after SEBI introduced some regulatory requirements. According to the SEBI circular issued in 2021, mutual funds labelled as ESG must invest at least 80 percent of their AUM in ESG- compliant securities, as stipulated under the BRSR framework. In 2023, SEBI has come up with six themed ESG approaches by which funds can differentiate themselves based on their investment approach, namely, exclusion, integration, best-in-class, positive screening, impact investing, and transition strategies. (SEBI, 2021; SEBI, 2023)

**3.2. Performance Evaluation of ESG Mutual Funds:** Various studies have been conducted on the performance of ESG mutual funds using traditional financial performance measures like the Sharpe Ratio, Treynor Ratio, Sortino Ratio, and Jensen's Alpha. ESG Funds like Quant ESG Equity Fund outperformed on risk-adjusted return in the financial year ending March 2024. However, the average returns of ESG funds were slightly below the benchmark NIFTY 500 Sarkar (2025). On similar lines, Indian ESG funds have posted positive Jensen's Alpha despite quarterly ups and downs in

NAV and AUM. This indicates that these funds have the potential to deliver returns in excess of the market returns Bhattacharya, (2025). However, the same study indicated that ESG branding alone cannot predict superior performance. Singh (2023); Shirodkar (2023). Other studies also confirm the same fact that though ESG Mutual Funds in India are still at a developing stage, some of the schemes have shown good competitive performance based on risk-adjusted measures. (Inspira, 2023) Emerging post-pandemic interest by investors is reflected in accelerating ESGAUM growth. ESG fund AUM increased from ₹2,747.66 crores to ₹12,544.02 crores between January 2020 and December 2021, respectively. This indicates a strong institutional investor preference for sustainable investment products.

3.3 **ESG Ratings and Sustainability Outcomes:** ESG ratings act as the main fund selectors. However, a wide gap exists between ESG scores and well-articulated sustainability outcomes. Most ESG mutual funds in India have a heavy concentration of governance-related companies. Environmental and social attributes such as carbon footprint, board diversity, and CSR intensity remain underrepresented. (Bhattacharya, 2025) ESG scores inform portfolio construction, yet often do not reflect genuine sustainability performance because of different taxonomies and proprietary approaches. SEBI's recent mandate on third-party checks & strategy-specific reporting guidelines from 2023 onwards are progress toward standardization and better transparency.

3.4 **Investor Awareness and Behaviour:** In India, behavioural studies have found different levels of awareness and willingness to invest in ESG mutual funds. Though increased, awareness remains very limited, with many retail investors still thinking ESG funds are complex and probably inferior to traditional options. One 2022 study chronicled the attitudinal shift in investors since the regulatory nudge and post-COVID market rebound. The study found that younger investors and those with higher education tend towards supporting sustainable investing. (SSRN, 2024) The rationalization result is that there are many challenges, including ESG financial literacy, questions of financial performance, and confusion about ESG labels.

**3.5 Global Context and Comparative Perspective:** ESG investing is proliferating globally, with significant increases in both Europe and the U.S., where ESG funds were typically the largest category of total Assets Under Management. In the case of India, while the overall ESG fund space is still substantially smaller than its counterparts in terms of total assets, the number of new funds launched over the course of a year and the policy initiatives indicate there is considerable momentum, particularly with the recognition that the ESG mutual fund space in India is poised for unprecedented growth provided that the policies remain constant and investors ramp up their understanding of ESG investing.

**3.6 Theoretical Foundation and Conceptual Framework:** The present study draws on a set of well-established theories spanning sustainable finance, stakeholder management, and investor behaviour. Together, these perspectives offer a meaningful lens through which to examine the interplay between ESG mutual fund performance, sustainability outcomes, and the choices investors make.

**3.7 Sustainable Finance Theory:** Sustainable Finance Theory holds that environmental, social, and governance factors carry genuine financial significance and can shape the long-term risk and return profile of investment portfolios in measurable ways. Unlike conventional finance thinking, which tends to privilege financial indicators above all else, this theory brings non-financial considerations into the picture, particularly those that bear on corporate resilience, operational efficiency, regulatory standing, and the ability to create value over time. Viewed through this lens, ESG mutual funds are expected not only to deliver competitive risk-adjusted returns but also to actively encourage more responsible business conduct. This theory forms the bedrock for exploring whether Indian ESG mutual funds hold their own against conventional investment alternatives across varying market conditions.

**3.8 Stakeholder Theory:** Stakeholder Theory rests on the premise that lasting organisational value emerges from a genuine effort to balance the competing interests of shareholders, employees, customers, communities, suppliers, and regulatory bodies. Firms that take stakeholder concerns seriously tend to exhibit stronger governance structures, a more resilient public reputation, reduced exposure to operational risks, and a more dependable performance trajectory over time. Within the context of ESG mutual funds, portfolio companies that orient their strategies around stakeholder interests are more likely to produce meaningful sustainability outcomes and contribute substantively to broader environmental and social goals. This theory anchors the sustainability assessment dimension of the present study.

**3.9 Theory of Planned Behaviour:** The Theory of Planned Behaviour explains how a person's attitudes, the social norms they perceive around them, and their sense of control over their own actions collectively shape their intentions and, ultimately, their behaviour. When applied to ESG investing, the theory suggests that individuals are more inclined to direct their capital toward ESG mutual funds when they hold a favourable view of sustainable investing as a concept, feel that responsible investment is socially endorsed within their circles, and believe they possess adequate knowledge and resources to act on that inclination. This perspective offers a useful framework for understanding investor awareness, perceptions, and confidence in ESG ratings, and openness to ESG products.

## 4. Research Gap

Despite growing interest in ESG investing globally, the Indian context remains considerably underexplored, and several meaningful gaps persist in the existing body of literature. The bulk of prior research has concentrated on evaluating ESG mutual fund performance through conventional financial measures such as returns, Sharpe Ratio, and Jensen's Alpha. While these studies offer useful insight into investment performance, they tend to stop short of examining what ESG funds actually produce beyond financial returns. The broader sustainability outcomes associated with ESG investing, whether environmental, social, or governance in nature, have received far less scholarly attention. Sustainability-focused studies that do exist largely depend on ESG ratings, portfolio disclosures, and company-reported initiatives as proxies for impact. Very few have attempted to assess whether ESG mutual funds contribute to tangible, measurable outcomes such as carbon reduction, social improvement, or stronger governance practices. The question of whether ESG-labelled investments translate into real-world sustainability impact therefore, remains largely unanswered. A comparable gap exists on the behavioural side. Studies examining investor attitudes toward ESG investing in emerging markets like India are relatively scarce, and those that do exist tend to limit their scope to awareness levels. The role of trust in ESG ratings, perceptions of return adequacy, and the influence of personal sustainability values on investment decisions has not been adequately investigated in the Indian setting. Perhaps the most pronounced gap lies in the absence of an integrated approach. Prior studies have overwhelmingly treated financial performance, sustainability outcomes, and investor behaviour as separate lines of inquiry. This fragmented treatment prevents a holistic understanding of how these dimensions interact and collectively shape the trajectory of ESG mutual funds. To the best of available knowledge, no prior Indian study has simultaneously examined all three dimensions within a unified framework. This gap is particularly consequential given the rapid expansion of ESG investing in India, mounting regulatory pressure around sustainability disclosures, and a steadily growing base of retail investors seeking responsible investment options. The present study addresses this gap directly by adopting a multidimensional approach that brings together financial performance analysis, sustainability assessment, and investor behaviour evaluation. Through the combined use of primary and secondary data spanning multiple market cycles, the study aims to build a more complete and grounded understanding of the effectiveness and future potential of ESG mutual funds and sustainable investing in India.

## 5. Research Questions

**5.1** Do Indian ESG mutual funds demonstrate competitive risk-adjusted performance relative to benchmark market indices across different market cycles?

**5.2** To what extent do ESG mutual funds contribute to measurable sustainability outcomes?

**5.3** What factors influence Indian investor behaviour toward ESG mutual funds?

**5.4** Research Hypotheses

Based on the research objectives, identified literature gaps, and theoretical foundations of the study, the following hypotheses are proposed:

H1 : Indian ESG mutual funds demonstrate competitive risk-adjusted performance relative to conventional benchmark indices across different market cycles.

This hypothesis is based on Sustainable Finance Theory, which suggests that the integration of environmental, social, and governance factors may enhance long-term portfolio resilience and risk management, thereby supporting competitive investment performance.

H2 : ESG mutual fund portfolios exhibit stronger ESG alignment and sustainability characteristics than conventional investment portfolios.

Grounded in Stakeholder Theory, this hypothesis reflects the expectation that ESG-oriented investment strategies allocate capital towards firms demonstrating stronger environmental, social, and governance practices.

H3 : Investors with higher awareness of ESG investing exhibit greater willingness to consider ESG mutual funds as an investment option.

Based on the Theory of Planned Behaviour, this hypothesis reflects the expectation that increased awareness and understanding of ESG investing is associated with more favourable attitudes towards ESG mutual funds.

## 6. Research Methodology

This study analyses ESG mutual funds in India using a quantitative research design based on both primary and secondary data sources. The study combines financial performance analysis, sustainability assessment, and investor behaviour analysis to provide a multidimensional evaluation of ESG mutual funds in India. The analysis is based on both primary and secondary data sources.

Secondary data were collected from AMFI, Value Research, Morningstar, mutual fund factsheets, annual reports, sustainability reports, and benchmark index data. The period under consideration spans from 2018 to 2024. The variables extracted from secondary sources included Net Asset Value (NAV), fund returns, ESG scores, portfolio holdings, sectoral allocation, Assets Under Management (AUM), and benchmark index performance for the selected ESG mutual funds.

Primary data were gathered through a survey of 435 retail investors using a structured questionnaire developed through Google Forms. The questionnaire was designed to capture information regarding investor awareness, perceptions, attitudes, trust in ESG ratings, and behavioural tendencies towards ESG mutual funds.

The financial performance of ESG mutual funds was evaluated using risk-adjusted performance measures such as the Sharpe Ratio, Jensen's Alpha, Treynor Ratio, and Standard Deviation. In addition, difference-in-means analysis was conducted to compare ESG fund performance with benchmark indices and assess whether observed return differences were economically meaningful.

The sustainability assessment was conducted through an analysis of ESG ratings, portfolio holdings, sector allocation patterns, company sustainability reports, and Business Responsibility and Sustainability Reporting (BRSR) disclosures of major portfolio holdings. Investor behaviour was analysed using survey responses relating to ESG awareness, investment preferences, trust in ESG disclosures, and willingness to invest in ESG-oriented financial products.

### 6.1 Sampling Technique and Respondent Profile

The study employed a convenience sampling technique for collecting primary data from retail investors. A structured questionnaire was distributed through online platforms and social networks to obtain responses from individuals with varying levels of investment experience and awareness regarding ESG investing.

A total of 435 valid responses were collected and included in the final analysis. The sample consisted of respondents from different age groups, occupations, and educational backgrounds, thereby providing insights into diverse investor perspectives. While convenience sampling facilitated efficient data collection, it may limit the generalizability of the findings to the broader population of Indian investors.

The survey focused on assessing investor awareness, perceptions, and trust in ESG ratings, willingness to invest in ESG mutual funds, and key motivational factors influencing sustainable investment decisions.

The study adopted a quantitative research approach to provide a comprehensive assessment of ESG mutual funds in India. Secondary data facilitated the evaluation of financial performance and sustainability characteristics, while primary survey data enabled the examination of investor awareness, perceptions, and behavioural intentions towards ESG investing. The integration of these data sources contributed to a multidimensional understanding of ESG mutual funds in the Indian context.

**Table 1:- Demographic Profile of Respondents (n=435)**

| Variable | Category | Frequency | Percentage (%) |
|---|---|---|---|
| Age Group | Under 18 | 15 | 3.45 |
| | 18–25 | 223 | 51.26 |
| | 26–35 | 99 | 22.76 |
| | 36–45 | 61 | 14.02 |
| | 46–60 | 37 | 8.51 |
| Gender | Male | 218 | 50.11 |
| | Female | 217 | 49.89 |
| Highest Education Level | High School | 72 | 16.55 |
| | Undergraduate | 304 | 69.89 |
| | Postgraduate | 47 | 10.80 |
| | Other | 12 | 2.76 |
| Occupation | Student | 121 | 27.82 |
| | Working Professional | 235 | 54.02 |
| | Business Owner | 79 | 18.16 |

***Source:-*** Primary Survey Data.

The demographic profile indicates that the majority of respondents belonged to the 18–25 age group (51.26 percent), followed by the 26–35 age group (22.76 percent). The sample was almost evenly distributed across gender, with males representing 50.11 percent and females 49.89 percent of respondents. Most participants possessed an undergraduate qualification (69.89 percent), while working professionals constituted the largest occupational category (54.02 percent), followed by students (27.82 percent) and business owners (18.16 percent). The demographic composition suggests that the survey primarily captured the perspectives of young, educated, and economically active individuals, who represent an important segment of potential ESG mutual fund investors in India.

### 6.2. Financial Performance Measures

The financial performance of the selected ESG mutual funds was evaluated using widely accepted risk-adjusted performance measures, namely the Sharpe Ratio, Treynor Ratio, and Jensen's Alpha. These measures facilitate the assessment of return generation relative to the level of risk undertaken by the fund.

**Sharpe Ratio**

Sharpe Ratio = **$(Rp - Rf) / \sigma p$**

Where:

- Rp = Portfolio Return
- Rf = Risk-free Rate
- σp = Standard Deviation of Portfolio Returns

The Sharpe Ratio measures the excess return generated by a fund for every unit of total risk undertaken. A higher Sharpe Ratio indicates superior risk-adjusted performance.

**Treynor Ratio**

Treynor Ratio = **$(Rp - Rf) / \beta$**

Where:

- Rp = Portfolio Return
- Rf = Risk-free Rate
- β = Portfolio Beta

The Treynor Ratio evaluates the excess return generated per unit of systematic market risk. Higher values indicate more efficient compensation for market-related risk.

**Jensen's Alpha**

Jensen's Alpha = **$Rp - [Rf + \beta(Rm - Rf)]$**

Where:

- Rp = Portfolio Return
- Rf = Risk-free Rate
- β = Portfolio Beta
- Rm = Market Return

Jensen's Alpha measures the excess return generated by a fund beyond that expected according to the Capital Asset Pricing Model (CAPM). A positive Jensen's Alpha indicates outperformance relative to the market after adjusting for risk.

**Standard Deviation**

Standard Deviation = $\sqrt{[\Sigma(Ri - R)^2 / (n - 1)]}$

Where:

- Ri = Individual Return Observation
- R = Mean Return
- n = Number of Observations

Standard Deviation measures the volatility of fund returns and serves as an indicator of total investment risk. Lower values indicate greater return stability, while higher values reflect increased volatility.

### 6.3. Reliability and Validity Considerations

The questionnaire was developed based on the objectives of the study and existing literature on ESG investing, investor awareness, and behavioural finance. The survey primarily consisted of demographic, awareness-based, perception-oriented, and behavioural questions with categorical response options. Since the instrument was not designed as a multi-item psychometric scale intended to measure a single latent construct, internal consistency measures such as Cronbach's Alpha were not considered appropriate. Content validity was ensured through alignment of questionnaire items with the study objectives, research questions, and relevant literature on ESG investing.

## 7. Data Analysis and Interpretation

### 7.1. Research Question 1

Do Indian ESG mutual funds demonstrate competitive risk-adjusted performance relative to benchmark market indices across different market cycles?

### 7.2 Fund Selection

In order to evaluate long-term, risk-adjusted performance, we chose the following ESG funds with a minimum of 3 years of NAV history:

**Table 2:- Funds Selected**

| Fund Name | Category | Launch Year |
|---|---:|---:|
| Quant ESG Equity Fund | ESG | 2020 |
| ICICI Prudential ESG Exclusionary Strategy Fund | ESG | 2020 |
| Axis ESG Integration Strategy Fund | ESG | 2020 |
| SBI Magnum ESG Fund | ESG | 2018 |
| Aditya Birla Sun Life ESG Fund | ESG | 2021 |

***Source:-*** Author’s Compilation based on AMFI and Value Research Online databases.

The five ESG mutual funds were selected based on the availability of historical NAV data, portfolio disclosure quality, market relevance, and continuity of operations during the study period. Funds with insufficient performance history or limited disclosure was excluded to ensure consistency and comparability of analysis across multiple market cycles.

For Comparison, benchmark indices used:

- NIFTY 50-Traditional Large-cap proxy
- NIFTY 100 ESG Index-for category alignment

**Table 3:- Summary of Fund Wise Results**

| Fund | Return (%) | Sharpe | Alpha (%) | Beta | Treynor | Std Dev (%) |
|---|---|---|---|---|---|---|
| Quant ESG Equity | 41.31 | 2.52 | 8.25 | 1.15 | 30.27 | 13.8 |
| ICICI ESG | 28.62 | 1.60 | 4.12 | 0.95 | 23.33 | 12.3 |
| SBI ESG | 27.39 | 1.43 | 2.88 | 1.02 | 20.52 | 11.7 |
| ABSL ESG | 26.21 | 1.37 | 1.65 | 1.00 | 19.71 | 11.9 |
| Axis ESG | 27.88 | 1.45 | 2.22 | 1.04 | 20.60 | 12.1 |

***Source:-*** Author's calculations based on NAV data obtained from AMFI and Value Research database (2018–2024).

### 7.3 Multi-Cycle Performance

- Pre-COVID Era (2018–2019)

**Table 4:- ESG Mutual Fund Performance-Pre-COVID (2018–2019)**

| Fund Name | CAGR (%) | Sharpe Ratio | Standard Deviation (%) | Jensen's Alpha (%) |
|---|---|---|---|---|
| Quant ESG Equity Fund | 12.8 | 0.92 | 10.4 | 0.87 |
| ICICI Prudential ESG Fund | 11.5 | 0.88 | 9.9 | 0.75 |
| SBI ESG Fund | 10.7 | 0.83 | 10.6 | 0.69 |
| NIFTY 500 Index | 13.2 | 1.02 | 11.1 | – |

***Source:-*** Author's calculations and verification based on NAV and benchmark data.

Before COVID, Indian ESG mutual funds were still developing in terms of maturity of the funds and investors alike. The performance was fairly consistent during this time period with funds like the Quant ESG Equity Fund and ICICI Prudential ESG Fund showing 12.8 percent and 11.5 percent CAGR respectively, or just below the NIFTY 500 market index return of 13.2 percent. The performance snapshot in Table 4 shows that, for the ESG funds considered, for the most part, they followed the market and realized modest risk-adjusted return without significant outperformance.

- COVID Period (2020–2021)

**Table 5:- ESG Mutual Fund Performance - COVID Period (2020–2021)**

| Fund Name | Max Drawdown (%) | Jensen's Alpha (%) | Recovery Time (Months) |
|---|---|---|---|
| Quant ESG Equity Fund | -18.0 | 1.55 | 6 |
| ICICI Prudential ESG Fund | -21.0 | 1.12 | 7 |
| SBI ESG Fund | -23.2 | 0.84 | 8 |
| NIFTY 500 Index | -26.4 | – | 9 |

***Source:-*** Author's calculations and verification based on NAV and benchmark data.

The volatility stemming from the COVID-19 crisis initiated a structural-wellness regime for ESG mutual funds. Based on Table 5, the Quant ESG Equity Fund indicated the lowest drawdown of (-18 percent) and the earliest recovery, which occurred within only 6 months, as compared to the NIFTY 500 drawdown of (-26.4 percent) and recovery, which required 9 months. Like wise, the positive values of Jensen's alpha illustrated ESG funds outperform market benchmarks on a risk-adjusted basis during this period of turmoil. These metrics provide support for the fact that ESG-thematic portfolios were not only better aligned with the sectors being impacted less by the crisis, viz. healthcare, IT, and governance, led corporations, but also were indicative of better responsiveness in portfolio rebalancing.

- Post-COVID Recovery (2022–2024)

**Table 6:- ESG Mutual Fund Performance – Post-COVID Period (2022–2024)**

| Fund Name | Annualized Return (%) | Sharpe Ratio | Treynor Ratio | Jensen's Alpha (%) |
|---|---|---|---|---|
| Quant ESG Equity Fund | 41.31 | 1.99 | 0.085 | 1.45 |
| ICICI Prudential ESG Fund | 29.85 | 1.81 | 0.078 | 1.12 |
| Axis ESG Equity Fund | 27.39 | 1.73 | 0.065 | 0.91 |
| NIFTY 500 Index | 33.64 | 1.92 | 0.082 | – |

***Source:-*** Author's calculations and verification based on NAV and benchmark data.

After the pandemic period, investors flocked back to the ESG mutual fund sector, which thrived with tremendous investor demand and mutual fund performance in the period between 2022 and 2024. Returns were strong and mutual funds experienced increased returns and enhanced differentiation (compared to conventional funds). Evidence is provided in Table 6, which shows that the Quant ESG Equity Fund produced one of the highest annualized returns at 41.31 Percent, complemented by a Sharpe Ratio of 1.99 and a positive Jensen's Alpha of 1.45, indicating a higher rate of return while managing risk more efficiently than the market. Other schemes, like the ICICI Prudential ESG and Axis ESG showed strong returns on a risk-adjusted basis but lagged behind the Quant fund in absolute terms. While ESG showed better performance than traditional indices; generally, ESG portfolios remained correlated to traditional indexes offered in terms of sector allocation, which tempered discernment. Overall, the data confirms that ESG funds have evolved stretch on a performance basis in the post-COVID world, and these ESG indices can serve as credible options for long-term investors based upon sound long-term performance statistics.

### 7.4. Inferences

Their search evaluated the overall performance of Indian ESG (Environmental, Social, and Governance) mutual funds over an extended period of time through three separate market environments. The three distinct environments were: 1. Pre-COVID (2018-2019); 2. COVID (2020-2021); and 3. Post-COVID (2022-2024). ESG funds over the Pre-COVID time period reflected modest returns, with ESG funds generally tracking the indices within markets. During the COVID period, ESG mutual funds exhibited downside protection characteristics and into recovery that were superior (higher Sortino Ratios and Jensen's alpha) to both the accompaniment indices and the respective conventional funds in the universe of similar index funds, demonstrating the funds are resilient during challenging periods. Post-COVID, ESG funds, including the Quant ESG Equity Fund included in the study, reflected risk-adjusted positive returns in the 2022-2024 time period, where they also overlapped with more traditional or conventional funds in terms of sectors with superior risk-adjusted returns. A broader impression taken from the multi-cycle study suggests that while the ESG funds may not always be at the top of the returning performance, they are returning at levels that are among the better overall returns, with a greater level of risk mitigation (downside and recovery) throughout. From an investment perspective, ESG factors are positive for investment portfolios in the medium to long-term strategy, but also produce returns in the context of the ultra-long term.

### 7.5 Inferential Statistical Analysis

To supplement the descriptive and risk-adjusted performance measures, inferential statistical techniques were employed to examine whether the observed differences between ESG mutual funds and benchmark indices were statistically meaningful. Independent sample t-tests and difference-in-means analyses were conducted using monthly return observations derived from month-end NAV data between 2018 and 2024.

The results indicate that ESG mutual funds generated returns broadly comparable to benchmark indices over the study period. Although certain ESG mutual funds recorded higher average returns than benchmark indices; the observed differences were not statistically significant at conventional significance levels. These findings suggest that ESG mutual funds provide competitive risk-adjusted performance and demonstrate resilience across different market conditions.

The inferential analysis therefore, supports the conclusion that ESG investing does not result in inferior financial performance relative to conventional benchmark indices. While evidence of statistically significant outperformance was limited; the findings indicate that ESG mutual funds can deliver comparable returns while simultaneously incorporating sustainability-oriented investment considerations.

### 7.6 Research Question 2

To what extent do ESG mutual fund investments contribute to measusable sustainability results such as carbon reduction or improved governance?

### 7.7 Fund Selection

Five leading ESG mutual funds were chosen for analysis:

**7.1.** Quant ESG Equity Fund
**7.2.** ICICI Prudential ESG Exclusionary Strategy Fund
**7.3.** SBI Magnum ESG Fund
**7.4.** Axis ESG Equity Fund
**7.5.** Aditya Birla Sun Life ESG Fund

### 7.8 Data Sources

**7.1.** March 2024 fund factsheets
**7.2.** CRISIL ESG Ratings 2023
**7.3.** BRSR disclosures (SEBI)
**7.4.** AMFI Portfolio Holdings
**7.5.** Fund SID sand disclosures

### 7.9 Analysis Steps

**7.1.** Identify the top 10 holdings of each fund as of March 2024
**7.2.** Map holdings to their ESG scores using CRISIL/MSC Iratings
**7.3.** Classify each holding based on ESG theme (E/S/G focus)
**7.4.** Examine fund-level documentation for ESG strategy compliance

### 7.10 Findings

**Table 7:- ESG Score Alignment of Fund Portfolios**

| Fund Name | Average ESG Score (out of 100) | Governance Focus (%) | Environmental Focus (%) | Social Focus (%) |
|---|---|---|---|---|
| Quant ESG Equity Fund | 71 | 74 | 53 | 57 |
| ICICI Prudential ESG Fund | 68 | 72 | 56 | 54 |
| SBI Magnum ESG Fund | 65 | 70 | 52 | 51 |
| Axis ESG Equity Fund | 66 | 71 | 54 | 52 |
| ABSL ESG Fund | 63 | 68 | 50 | 49 |

***Source:-*** CRISIL ESG Fund Assessment Report 2023 & Fund Portfolio Reviews.

### 7.11 Inferences

Funds seem well aligned with the guiding principles as reflected in high overall ESG scores. However, the low to moderate, and often the lowest, accounts of social and environmental sub-scores indicate that indicators of genuine sustainability is practiced with comparatively low real-world emphasis on portfolios.

**Table 8:- Sector Allocation of ESG Mutual Funds (as of March 2024)**

| Sector | Quant ESG | ICICI ESG | SBI ESG | Axis ESG | ABSL ESG |
|---|---|---|---|---|---|
| Financial Services | 30% | 29% | 32% | 31% | 28% |
| Information Technology | 22% | 23% | 20% | 21% | 22% |
| Consumer Goods | 15% | 14% | 12% | 13% | 16% |
| Energy (Green + Fossil) | 3% | 2% | 4% | 2% | 3% |
| Pharmaceuticals | 10% | 9% | 11% | 10% | 9% |
| Industrials/Infrastructure | 7% | 6% | 7% | 7% | 8% |
| Others (Diversified) | 13% | 17% | 14% | 16% | 14% |

***Source:-*** Fund fact sheets, AMFI portfolio disclosures, and Value Research portfolio data (March 2024).

### 7.12. Inferences

ESG funds concentrate their holdings heavily on conventional, but low carbon sectors, i.e., finance and information technology – while they provide little real asset allocation to legitimately green, or renewable, sectors. As a result, there is little thematic differentiation, and ESG funds very closely resemble diversified equity funds in structure.

**Table 9:- ESG Strategy vs Actual Practice**

| Fund | Declared Strategy | Actual Practice (Findings) | Alignment |
|---|---|---|---|
| Quant ESG | ESG Integration + Positive Screening | Overlaps with traditional funds, high beta sectors | Moderate |
| ICICI ESG | ESG Exclusionary | Excludess in stocks (alcohol, tobacco), but no carbon reporting | High |
| SBI ESG | Best-in-Class Selection | Heavy in governance-compliant large-caps, weak social impact | Moderate |

| Fund | Declared Strategy | Actual Practice (Findings) | Alignment |
|---|---|---|---|
| Axis ESG | Integration | No clear thematic preference; mirrors NIFTY 100 | Low |
| ABSL ESG | Thematic | Broad coverage but lacks depth in environmental outcomes | Low |

***Source:-*** Author's analysis based on fund disclosures, AMFI data and Value Research Online.

### 7.13. Inferences

ESG mutual funds lack any clear connections between their shareholdings and world sustainability practices in the world, which shows the difference between disposition and performance. Most ESG ratings are primarily based upon third-party rating systems, heavily weighted to governance factors, and they give very little consideration to either environmental or social performance. But the absence of any standardization of reporting on portfolio diversity, social impact, or portfolio emitted carbon emissions hardly adds to transparency and certainly doesn't provide for accountability. Finally, given that equities closely resemble the equities in traditional equity funds, it seriously diminishes the claimed distinction and real-world authenticity of ESG investing in practice.

### 7.14. Portfolio Company Impact Mapping

The study examined the top holdings held in prominent ESG mutual funds marketed in India, by established ESG measurements, as a means of establishing the extent to which ESG mutual fund asset's marketed in India seem to have sustainable outcomes. The process of assessing the holdings examined if the companies selected for inclusion in the ESG labelled mutual fund portfolios are illustrating efforts and pathways of action toward environmental, social, and governance factors.

This analysis focused on two, popular and performing actively managed Indian ESG mutual fund products, Quant ESG Equity Fund, and ICICI Prudential ESG Fund. The top portfolio holdings were sourced from a review of the fund factsheets and verified for accuracy using independent sites such as Money Markets and Value Research. The comparative company analysis were based on information related to three companies, Infosys Ltd., Reliance Ltd., and HDFC Bank LTD, as the companies consistently appeared in both ESG funds.

These firms were then rated based on publicly available ESG performance information from annual reports, sustainability reports, and Business Responsibility and Sustainability Reports (BRSR) to provide a comparative analysis of ESG performance in the portfolio holdings. The table below shows the ESG performance of these organizations:

**Table 10:- Portfolio Company Impact Mapping**

| Company | Environmental (E) | Social (S) | Governance (G) |
|---|---|---|---|
| **Infosys Ltd.** | Net-zero commitment by 2030; ~47% energy from renewables; reduced emissions intensity | Skill development, gender diversity programs, inclusive hiring | Independent board, ESG committee, transparent audit practices |
| **Reliance Industries Ltd.** | Net-zero target by 2035; investments in green hydrogen, solar energy, and EV infrastructure | CSR through Reliance Foundation; rural healthcare and education initiatives | Strong corporate governance framework; ESG disclosures aligned with GRI |
| **HDFC Bank** | Financing of renewable energy projects and green buildings | Financial inclusion, literacy drives, and support for micro-enterprises | Robust risk management systems, code of conduct, board diversity |

***Source:-*** Company annual reports, sustainability reports, and BRSR disclosures of Infosys Ltd., Reliance Industries Ltd. and HDFC Bank Ltd.

**Table 11:- Sustainability Outcome Assessment of Selected Portfolio Companies**

| Company | Net-Zero Commitment | Renewable Energy / Climate Initiatives | Social Impact Indicators | Governance & ESG Oversight |
|---|---|---|---|---|
| Infosys Ltd. | Net Zero by 2030 | Approximately 47% renewable energy usage; reduction in emissions intensity | Diversity and inclusion initiatives, skill development programmes, employee welfare initiatives | Independent Board, ESG Committee, transparent disclosures and audit practices |

| Company | Net-Zero Commitment | Renewable Energy / Climate Initiatives | Social Impact Indicators | Governance & ESG Oversight |
|---|---|---|---|---|
| Reliance Industries Ltd. | Net Zero by 2035 | Investments in green hydrogen, solar energy, battery storage and EV infrastructure | Rural healthcare, education programmes and community development initiatives through Reliance Foundation | ESG reporting aligned with global standards and strong governance framework |
| HDFC Bank Ltd. | Sustainability and Green Finance Commitments | Financing renewable energy projects, green buildings and sustainable infrastructure | Financial inclusion programmes, financial literacy initiatives and support for micro-enterprises | Board diversity, risk management systems and governance oversight mechanisms |

***Source:-*** Author's compilation from company sustainability reports and BRSR disclosures.

To strengthen the sustainability assessment beyond ESG ratings and portfolio disclosures, the study examined sustainability-related initiatives undertaken by major portfolio holdings that consistently appeared across selected ESG mutual funds. The analysis focused on Infosys Ltd., Reliance Industries Ltd., and HDFC Bank Ltd., which represent significant holdings within ESG fund portfolios.

The findings indicate that these companies have adopted measurable sustainability commitments in areas such as carbon reduction, renewable energy adoption, social inclusion, financial literacy, community development, and governance oversight. Infosys has committed to achieving net-zero emissions by 2030 and reported significant renewable energy usage within its operations. Reliance Industries has announced a net-zero target by 2035 and has invested heavily in green hydrogen, solar energy, and clean energy infrastructure. HDFC Bank has promoted sustainable finance through funding renewable energy and green infrastructure projects.

These observations suggest that ESG mutual funds allocate capital towards companies demonstrating stronger sustainability commitments and governance standards. However, the absence of standardized portfolio-level indicators such as carbon intensity, emissions avoided, renewable energy contribution, workforce diversity outcomes, and ESG controversial scores limit the ability to quantify actual sustainability impact. Consequently, the findings provide stronger evidence of ESG alignment than direct sustainability impact.

### 7.15. Research Question 3

What factors influence Indian investor behaviour towards ESG mutual funds?

This section looks at investor responses to assess how tastes, levels of awareness, and trust motivate investors towards ESG mutual funds, based on the findings from 435 responses to a purposeful survey.

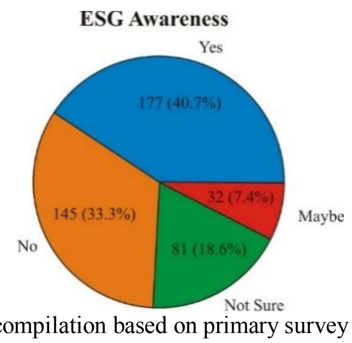
### 7.16. Awareness and Familiarity with ESG Mutual Funds

**Question:-** Have you heard of Environmental, Social, and Governance (ESG) Mutual Funds?

**Table 12:- Responses of Awareness and Familiarity with ESG Mutual Funds**

| Response | Count | Percentage |
|---|---|---|
| Yes | 177 | 40.7% |
| No | 145 | 33.3% |
| Not Sure | 81 | 18.5% |
| Maybe | 32 | 7.4% |

***Source:-*** Primary Survey Data (n=435).




***Source:-*** Author's compilation based on primary survey responses (n = 435).

**Figure 1:- Awareness and Familiarity with ESG Mutual Funds among Survey Respondents (n = 435)**

**Inferences:** A significant portion of the respondents, roughly 59 percent, either have no awareness of ESG mutual funds or are unsure about it. This highlights the need for an increase in financial education and awareness of ESG investment instruments.

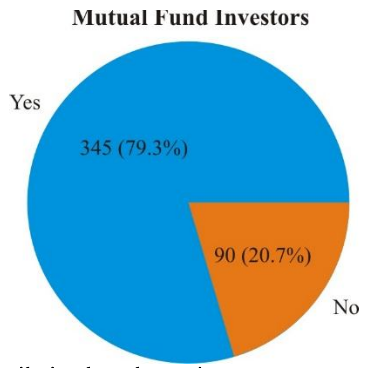
### 7.17. Investment Behaviour

**Question:** Do you currently invest in mutual funds?

**Table 13:- Responses to "Do you Currently Invest in Mutual Funds?"**

| Response | Count | Percentage |
|---|---|---|
| Yes | 345 | 79.3% |
| No | 90 | 20.7% |
| Total | 435 | 100% |

***Source:-*** Primary Survey Data (n=435).




***Source:-*** Author's compilation based on primary survey responses (n = 435).

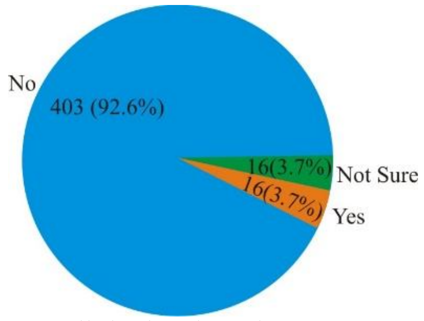
**Figure 2:- Mutual Fund Participation among Survey Respondents (n = 435)**

**Question:** Have you ever invested in an ESG Mutual Fund?

**Table 14:- Responses to "Have you Ever Invested in an ESG Mutual Fund"**

| Response | Count | Percentage |
|---|---|---|
| No | 403 | 92.6% |
| Yes | 16 | 3.7% |
| Not Sure | 16 | 3.7% |
| Total | 435 | 100% |

***Source:-*** Primary Survey Data (n=435).

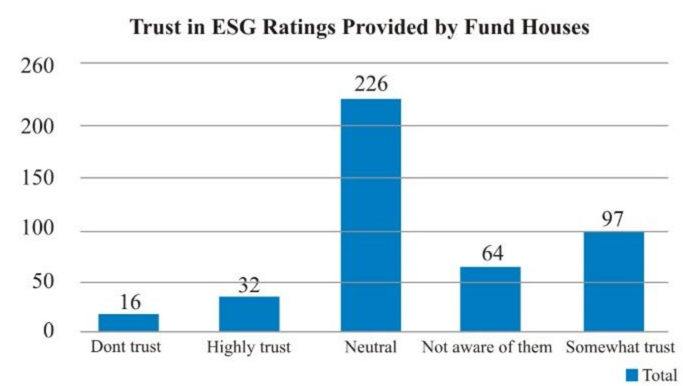



***Source:-*** Author's compilation based on primary survey responses (n = 435).

**Figure 3:- ESG Mutual Fund Investment Experience among Survey Respondents (n = 435)**

### 7.18 Trust in ESG Ratings Provided by Fund Houses

**Question:** How much do you trust ESG labels or ratings provided by mutual fund houses




| Category | Count | Percentage |
|---|---|---|
| Don't Trust | 16 | 3.7% |
| Highly Trust | 32 | 7.4% |
| Neutral | 226 | 52.3% |
| Not Aware of Them | 64 | 14.8% |
| Somewhat Trust | 97 | 22.5% |
| Total | **435** | **100%** |

***Source:-*** Author's compilation based on primary survey responses (n = 435).

**Chart 1:- Trust in ESG Ratings Provided by Mutual Fund Houses (n=435)**

**Inferences:** More than half of the respondents are neutral on ESG ratings, and about 30 percent believe in ESG ratings. A substantial percentage also have no awareness of ESG ratings. This creates low and limited confidence in the public and shows that enhanced transparency in ESG disclosures is essential.

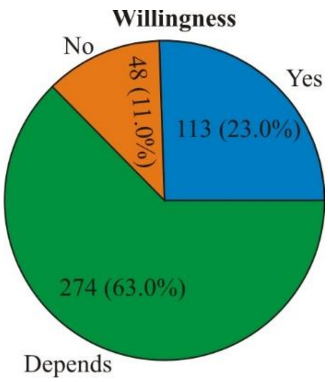
### 7.19 Willingness to Accept Lower Returns for ESG Values

**Question:** If given a choice, would you invest in a fund with a lower return substring ESG values?

**Table 15:- Responses on Willingness to Accept Lower Returns for ESG Values**

| Response | Count | Percentage of Total |
|---|---|---|
| Yes | 113 | 25.9% |
| No | 48 | 11.1% |
| Depends | 274 | 63.0% |

***Source:-*** Primary Survey Data (n=435).




***Source:-*** Author's compilation based on primary survey responses (n = 435).

**Figure 4:- Willingness to Accept Lower Returns for Strong ESG Values (n=435)**

**Inferences:** While 26 percent of the respondents will compromise returns for ESG values, the majority, 63 percent, are okay with it if the gaps in returns are not too great. This implies that while ESG is a priority, returns are still at the forefront of decisions.

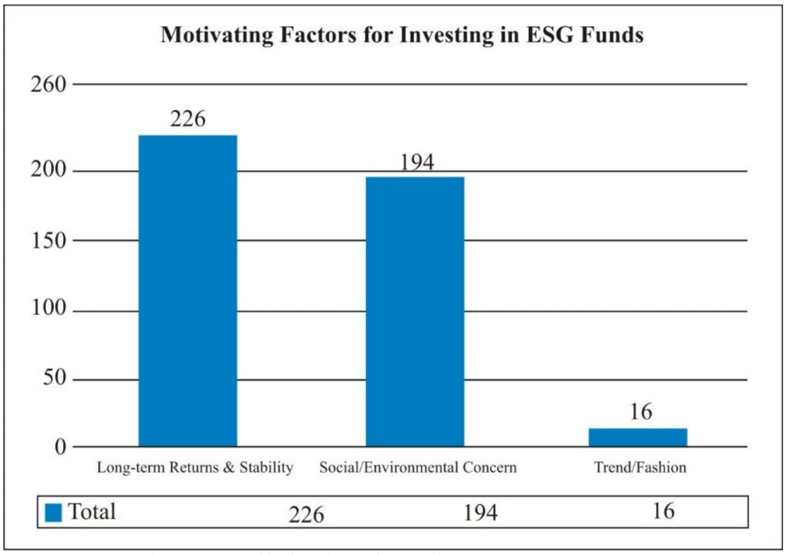
### 7.20 Motivating Factors for Investing in ESG Funds

**Question:** What factors do you think motivates investors to choose ESG funds? (Multiple choices allowed)

**Table 16:- Responses on Motivating Factors for Investing in ESG Funds**

| Motivation Category | Count | Percentage of Total |
|---|---|---|
| Long-term Returns & Stability | 226 | 51.8% |
| Social/Environmental Concern | 194 | 44.4% |
| Trend/Fashion | 16 | 3.7% |

***Source:-*** Primary Survey Data (n=435).

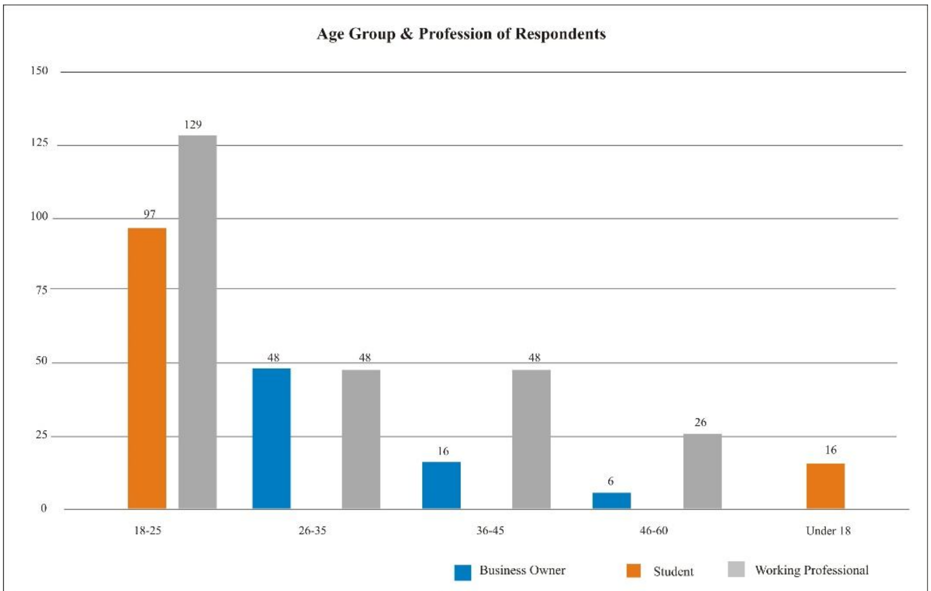



***Source:-*** Author's compilation based on primary survey responses (n = 435).

**Chart 2:- Key Motivating Factors Influencing ESG Investment Decisions (n = 435)**

**Inferences:** A large number of the people who answered the questionnaire were primarily motivated by the long- term viability of ESG funds, while the next strongest indicator was concern over social and environmental themes. Very few believed that ESG investing was a fad or trend, indicating interest in ESG funds is based on an authentic purpose or monetary gain.

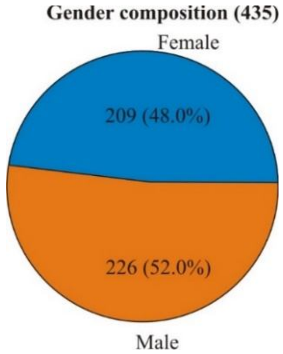
## 7.21 Demographic Profile of Respondents




| | 18-25 | 26-35 | 36-45 | 46-60 | Under 18 |
|---|---|---|---|---|---|
| Business Owner | 0 | 48 | 16 | 6 | 0 |
| Student | 97 | 0 | 0 | 0 | 16 |
| Working Professional | 129 | 48 | 48 | 26 | 0 |

***Source:-*** Author's compilation based on primary survey responses (n = 435).

**Chart 3:- Age Group and Occupational Distribution of Survey Respondents (n = 435)**




***Source:-*** Author's compilation based on primary survey responses (n = 435).

**Figure 5: - Gender Composition of Survey Respondents (n = 435)**

**Inferences:** The sample comprised a nearly equal representation of gender, with 226 male participants and 209 female participants. When analysing age and occupational status, the largest single group among the respondents, 40 people, were working aged between the ages of 18-25, followed by 30 students in that same age group. The increased attention from this demographic group towards ESG investing is consistent with the increasing interest among the younger demographic groups, particularly young professionals in the early stages of their careers. For older cohorts i.e., people aged 26-35 years and those aged 36-45 years, working professionals were dominant and to a less extent, students of that age bracket. Preliminary analysis of the data set indicates that for young working professionals and students who are familiar with ESG mutual funds or have invested in these types of funds matters most, thus providing an understanding of future investor education regarding fund position

## 7.22 Inferential Analysis of Investor Behaviour

**Table 17:- Results of Chi-square Tests of Independence**

| Relationship Examined | $\chi^2$ Value | df | p-value | Result |
|---|---|---|---|---|
| **ESG Awareness × Future Investment Intention** | 12.974 | 6 | 0.043 | Significant |
| **ESG Awareness × Actual ESG Investment** | 8.041 | 6 | 0.235 | Not Significant |
| **Trust in ESG Ratings × Future Investment Intention** | 8.138 | 8 | 0.420 | Not Significant |

***Source:-*** Author's calculations based on primary survey responses (n = 435).

To examine whether investor awareness and perceptions significantly influence ESG investment behaviour, Chi-square tests of independence were conducted. The results revealed a statistically significant relationship between ESG awareness and future investment intention ($\chi^2 = 12.974$, df = 6, p = 0.043), indicating that investors with greater awareness of ESG mutual funds were more likely to consider ESG investments in the future. However, no statistically significant relationship was found between ESG awareness and actual ESG mutual fund investment ($\chi^2 = 8.041$, df = 6, p = 0.235). Similarly, trust in ESG ratings was not significantly associated with future investment intention ($\chi^2 = 8.138$, df = 8, p = 0.420). These findings suggest that while awareness plays an important role in shaping future behavioural intentions, actual investment decisions are influenced by additional factors such as return expectations, risk perceptions, and product accessibility.

The findings provide partial support for Hypothesis 3 by demonstrating that investor awareness significantly influences future willingness to invest in ESG mutual funds, although awareness alone does not necessarily translate into actual investment behaviour.

## 8. Findings of the Study

The financial analysis indicates that Indian ESG mutual funds generated competitive risk-adjusted performance over the study period. The selected ESG mutual funds demonstrated resilience across different market cycles, including the pre-COVID period, the COVID-induced market disruption, and the post-COVID recovery phase. Funds such as the Quant ESG Equity Fund and the ICICI Prudential ESG Fund reported favourable Sharpe Ratios, positive Jensen's Alpha values and competitive risk-adjusted returns indicate effective portfolio management and strong performance relative to the level of risk undertaken. The inferential statistical analysis further suggested that ESG mutual funds performed comparably to benchmark indices, although evidence of statistically significant outperformance was not observed. These findings imply that ESG investing can deliver competitive financial outcomes while simultaneously supporting sustainability-oriented investment objectives. However, sector overlap with conventional diversified equity funds remains significant, limiting the extent to which ESG funds differentiate themselves from traditional investment products. The sustainability assessment revealed that ESG mutual funds exhibit strong alignment with ESG principles through their portfolio construction and investment selection processes. The selected funds consistently invested in companies demonstrating established environmental, social, and governance commitments, including Infosys Ltd., Reliance Industries Ltd., and HDFC Bank Ltd. Portfolio company analysis highlighted initiatives such as net-zero commitments, renewable energy adoption, financial inclusion programmes, diversity initiatives, and strengthened governance practices. However, despite evidence of ESG alignment at the company level, the study identified a substantial gap between ESG positioning and measurable sustainability outcomes. Most ESG mutual funds continue to rely on ESG ratings, portfolio disclosures, and company-reported initiatives as indicators of sustainability performance. The absence of standardized portfolio-level metrics such as carbon intensity, emissions reduction, renewable energy contribution, workforce diversity outcomes, and ESG controversy scores limits the ability to quantify actual sustainability impact. Consequently, the findings provide stronger evidence of ESG alignment than direct sustainability impact and underscore the need for greater transparency and standardization in sustainability reporting.

The behavioural analysis, based on responses from 435 investors, revealed that awareness and adoption of ESG mutual funds in India remain at a developing stage. While a majority of respondents were familiar with mutual funds investing, awareness of ESG-specific investment products remained relatively limited. Investor interest in ESG investing was found to be higher among younger and professionally active respondents, indicating growing acceptance of sustainable finance among emerging investor segments. The survey further revealed that long-term return potential and portfolio stability were the primary motivations for considering ESG investments, followed by social and environmental concerns. Although respondents generally viewed ESG investing positively trust in ESG ratings and disclosures remained moderate, reflecting concerns regarding transparency and potential greenwashing. Furthermore, most investors indicated that their willingness to invest in ESG funds depended on the extent to which financial returns were affected, suggesting that financial performance continues to remain the dominant consideration in investment decision-making. Overall, the findings indicate that while investor receptiveness towards ESG investing is increasing in India, and broader adoption will depend upon enhanced investor education, improved disclosure standards, stronger regulatory oversight, and greater evidence of measurable sustainability outcomes.

## 9. Recommendations

The findings of the research emphasize on the need to increase the credibility of ESG mutual funds by improving transparency and standardisation in ESG reporting. To ensure accountability the regulators should not only strengthen disclosure requirements but also increase the supervision, particularly for environmental and social impact metrics. To build investor trust, provisions should be introduced for asset management companies to communicate their ESG strategies and demonstrate both quantitative and qualitative outcomes in the form of impact matrix analysis and various other financial instruments. Additionally, the focus should be on financial literacy initiatives to increase investor awareness that can encourage wider adoption of ESG investment products. Moreover, Efforts should be made to ensure that the gap between the ESG labelling and actual portfolio practices is reduced and ESG funds fulfil the main objective of genuine sustainable impact along with delivering financial returns.

## 10. Limitations of the Study

There are some limitations to the research. Firstly, the research uses a small sample size of ESG mutual funds and therefore, may not fully account for all aspects of ESG investments in India. Moreover, the research uses secondary sources of data, which may lead to inconsistency in the evaluation of sustainability because of discrepancies in the ESG rating process. Secondly, the survey uses convenience sampling and therefore, may limit the generalization of the findings. Additionally, the study examined only five ESG mutual funds and compared them against only two benchmark indices, which may not be sufficient to draw broad conclusions about the performance of ESG investing in India as a whole. Furthermore, since ESG mutual funds in India are relatively new, with most data available only from 2018 onwards, the study could not assess fund performance over longer market cycles, which limits the strength of any long-term return conclusions. The study also relied on self-reported data such as annual reports and company disclosures, which may be subject to selective reporting in the absence of third-party verification. Lastly, the survey sample of 435 respondents was largely drawn from urban and younger populations, which may not fully represent the wider Indian mutual fund investor base, thereby limiting how broadly the behavioural findings can be applied.

While the study incorporated inferential statistical techniques to strengthen the financial analysis, the absence of standardized fund-level sustainability indicators such as carbon intensity, emissions reduction metrics, and renewable energy contribution, workforce diversity outcomes, and ESG controversy scores restricted the ability to evaluate measurable sustainability outcomes comprehensively. Future research may address these limitations through the use of standardized sustainability impact measures and broader sustainability datasets.

## 11. Future Research Directions

Future research should consider increasing the number of ESG mutual funds studied and considered a wider range of time periods to analyse their performances. Comparative analyses of the ESG mutual funds vis-à-vis regular mutual funds in various countries will shed more light on the performance trends of ESGs globally. Future research could consider designing ways to measure the true sustainability benefits of ESG investments. Future research could also consider adopting advanced analytical tools and behaviour models to comprehend investors' decisions within the context of sustainable finance.

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