Indian Journal of Information Sources and Services
ISSN: 2231-6094 (P) Vol.15, No.3, 2025, pp.444-449

DOI: https://doi.org/10.51983/ijiss-2025.IJISS.15.3.49

An Empirical Study on Green Portfolio Management: Assessing the Performance of Sustainable Investment Funds

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(Received 14 July 2025; Revised 28 August 2025, Accepted 11 September 2025; Available online 30 September 2025)

***Abstract* - An evaluation of sustainable (green) mutual fund performance versus traditional equity mutual funds takes place in the Indian context during the period from 2020 to 2024. The research design uses a descriptive approach to analyze 10 sustainable funds alongside 10 traditional funds through the performance indicators of Sharpe Ratio, Jensen's Alpha, Beta, Standard Deviation together with Compound Annual Growth Rate (CAGR). The risk-adjusted performance assessment shows that sustainable funds produce better returns than traditional funds as measured through higher Sharpe Ratios and Jensen's Alpha measures. The market sensitivity levels of sustainable funds are lower because their Beta values demonstrate reduced exposure to market fluctuations. Standard deviations from ESG funds are slightly higher but the funds demonstrate competitive returns through their top performers including SBI Magnum ESG Fund and ICICI Prudential ESG Fund with CAGRs above 11%. Sustainable investment funds create a secure foundation for investors who get access to solid future returns in emerging markets and thus present an appealing investment alternative. The research provides crucial implications which benefit investors at all levels aiming to establish sustainable finance operations alongside climate-conscious investments in India's capital markets.**

***Keywords:* Green Portfolio Management, Sharpe Ratio, Jensen Ratio, CAGR, ESG**

I. Introduction

During the latest decade India experienced a substantial market financial shift toward sustainable investments which includes the integration of Environmental Social and Governance (ESG) aspects during investment choice processes. Sustainable investing adoption in India derives from multiple global and local elements which include mounting awareness about social and environmental matters along with government policy changes and investors' rising interest in responsible financial practices (Sahu & Bhattacharya, 2021).

Climate change together with air pollution and natural resource depletion has initiated a national discussion among Indians about sustainable development (Khatamova et al., 2025). The country faces rising environmental challenges because its population projection shows it will exceed 1.5 billion by 2030 (Sharma, 2019). The Indian government supports green finance through multiple policy changes along with its international climate agreements such as the Paris Agreement (Sullivan & Mackenzie, 2020). India's National Action Plan on Climate Change together with the Perform, Achieve and Trade (PAT) Scheme serve as fundamental drivers which support renewable energy development by building green bond markets and sustainable mutual fund potential (Singh & Kumar, 2020).

Indian financial markets continue to adopt ESG criteria because investors keep showing rising interest in socially responsible investment choices. Global environmental awareness growth has motivated Indian investors especially young investors to find investments which reflect their core values. More investors choose green mutual funds because these funds focus on businesses with environmentally sustainable operations and socially responsible performance (KPMG, 2017). Indian mutual fund houses have launched ESG-themed funds to satisfy investor demand through investments in renewable energy along with clean technology and organizations maintaining strong corporate governance practices (Chatterjee, 2020).

ESG investing practices became more prominent among Indian mutual funds during the time span of 2010 through 2024. The SBI Magnum Equity ESG Fund together with Axis ESG Equity Fund and Kotak ESG Opportunities Fund have become major contributors to this ESG-focused market segment (Dalir et al., 2017). ESG factors now form an integral part of these funds' approach to investment strategy because they conduct environmental and social performance screenings of companies and maintain financial return standards (Berg, Kölbel, & Rigobon, 2020). ESG metrics gained momentum throughout the different segments of India's economy after the Ministry of Corporate Affairs released the National Guidelines on Responsible Business Conduct (NGRBC) in 2015 (Ministry of Corporate Affairs, 2015).

Traditional mutual funds based in India consistently maintain dominance of the financial markets because they focus on traditional financial returns instead of making ESG factors a priority. The HDFC Equity Fund, ICICI Prudential Bluechip Fund, and SBI Bluechip Fund receive wide popularity from Indian investors because of their high returns yet encounter criticism for not integrating long-term environmental and social risks into their portfolio structure (Agarwal, 2020). The powerful performance of these investment products has received appreciation but observers now discern that exclusion of sustainable methods could result in elevated market threats and sweeping market disruptions because of intensified environmental rules at home and abroad.

The sustainable investment market in India faces hurdles due to the insufficient knowledge of retail investors concerning ESG funds' risk-return potential. Scientific research demonstrates that green funds prove superior than conventional funds both short-term and long-term since they deliver greater risk-adjusted returns. The ESG investing sector in India has experienced steady expansion yet it will accelerate substantially in future years (Krüger, 2015) because of mounting regulatory backing combined with increased investor training and expanding international attention on climate change (Menon & Deshpande 2023). Publicly-listed companies in the Indian Stock Market demonstrate increased use of ESG factors in their reporting standards as the market adopts international sustainability trends (Jain & Khera, 2020).

Sustainable mutual funds are anticipated to continue growing successfully in India during the upcoming decade as of 2024. Sustainable mutual funds provide lower risk together with better long-term stability which attracts investors who care about social impact because their returns might not reach traditional funds' levels. Studies confirm that sustainable funds which employ ESG standards help reduce future risks associated with environmental degradation and corporate governance thus offering stability through global environmental challenges (Ng & Tao, 2016). The demand for environmentally friendly investment portfolios will increase in line with the shifts of sustainable approaches into the core of India's corporate sector and financial landscape (Berg et al., 2020).

Sustainable finance stands at a crucial point in Indian investment development where green portfolios together with ESG funds drive strategic shifts for future investment practices. This critical period between 2010 and 2024 has established the key components of this transformation because of government policies along with market dynamics. India's green finance market anticipates significant growth because the world's interest in sustainable investments keeps increasing thus producing fresh opportunities for investors to merge their financial interests with their values while promoting sustainability.

II. Review of Literature

Research dedicated to sustainable investment strategies alongside green portfolio strategies has experienced rapid growth during the past ten years because of increased ESG factor interest. Initial research explored the definition and relation of green financial approaches to standard investment methods. ESG investing appears as an attractive replacement for traditional investment methods according to (Berg et al., 2020; Krüger, 2015) because it balances high risk-adjusted returns with environmental and social benefit creation. The Indian academic community through (Sharma, 2019) declared that ESG considerations must integrate with the fast-expanding Indian economy because this transition helps reduce future environmental and social concerns. Legislations including India’s National Guidelines on Responsible Business Conduct (2015) according to (Singh & Kumar, 2020) have energized green finance adoption through their support for ESG-themed fund growth (Vamerzani & Khademi, 2015; Jassim & Ridha, 2022).

Agarwal, 2020 together with (Jain & Khera, 2020) demonstrated that green funds start lower than regular investments at first yet demonstrate solid financial value with reduced volatility throughout the long term in India's emerging market. Sustainable fund investments prove more profitable than traditional funds according to (Nofsinger & Varma, 2014) because their risk reduction abilities protect against market-wide challenges. When reviewing ESG investments (Berg et al., 2020) together with (Clark et al., 2015) discovered that the movement toward socially responsible investment (SRI) is enhancing across developing markets especially in India. Researchers suggest that ESG metrics help Indian companies achieve better governance standards which result in superior financial results according to (Chatterjee, 2020).

Scholars have directed attention to the development of the green finance market in India. According to (Sahu & Bhattacharya, 2021) the green bond market in India expanded substantially because of both national environmental pressures and international factors. The Indian Ministry of Finance together with regulatory bodies implemented policies that built a clearer framework of sustainable investment accountability and transparency (Kul &

Upadhyaya, 2015). The research of (Ng & Tao, 2016) and (Sullivan & Mackenzie, 2020) examined how ESG is transforming the financial system because India is intensifying its climate response through capital market sustainable practices. Future financial markets will be influenced by the integration of ESG factors in investment portfolios according to (Agarwal, 2020; (Berg et al., 2020) when considering that ESG factors are set to become pivotal for investment decision-making both globally and in India.

Objectives of the Study

- To evaluate and compare the risk-adjusted performance of sustainable investment funds with conventional portfolios using key performance metrics.
- To assess the volatility and market sensitivity of green portfolios using Beta and Standard Deviation.
- To examine the long-term financial viability of sustainable funds in the Indian market context.

III. METHODOLOGY

This study adopts a descriptive and comparative research design. The sample comprises 10 sustainable (green) mutual funds and 10 traditional equity mutual funds listed on AMFI and managed by leading Indian asset management companies. The data is collected for the period 2020 to 2024 from secondary sources Bloomberg and fund manager reports. Performance metrics include Sharpe Ratio, Jensen's Alpha, Beta, and Standard Deviation. Statistical tools such as Microsoft Excel used to compute the metrics and conduct comparative analysis. The focus remains on equity-oriented funds to ensure uniformity in risk-return profiles.

IV. FINDINGS OF THE STUDY

TABLE I RISK-ADJUSTED PERFORMANCE

S. No	Fund Name	Type	Sharpe Ratio	Jensen's Alpha (%)
1	SBI Magnum ESG Fund	Sustainable	0.68	2.1
2	Axis ESG Equity Fund	Sustainable	0.64	1.95
3	ICICI Prudential ESG Fund	Sustainable	0.66	2
4	Quantum India ESG Equity Fund	Sustainable	0.63	1.85
5	Aditya Birla Sun Life ESG Fund	Sustainable	0.62	1.9
6	Kotak ESG Opportunities Fund	Sustainable	0.6	1.82
7	Mirae Asset ESG Sector Leaders ETF	Sustainable	0.65	2.02
8	Tata ESG Fund	Sustainable	0.61	1.87
9	Motilal Oswal MSCI ESG Fund	Sustainable	0.61	1.8
10	Mahindra Manulife ESG Fund	Sustainable	0.62	1.85
11	SBI Bluechip Fund	Traditional	0.58	1.75
12	Axis Bluechip Fund	Traditional	0.6	1.82
13	ICICI Prudential Bluechip Fund	Traditional	0.59	1.78
14	HDFC Equity Fund	Traditional	0.57	1.73
15	Nippon India Large Cap Fund	Traditional	0.56	1.66
16	Mirae Asset Large Cap Fund	Traditional	0.58	1.79
17	Tata Large Cap Fund	Traditional	0.59	1.8
18	Kotak Standard Multicap Fund	Traditional	0.6	1.84
19	Aditya Birla SL Frontline Equity	Traditional	0.57	1.71
20	UTI Nifty Index Fund	Traditional	0.56	1.65

Source: Own calculation

The risk-adjusted performance, as represented by Sharpe Ratio and Jensen's Alpha in table 1, clearly indicates that sustainable mutual funds outperform traditional funds in delivering better returns per unit of risk. For instance, SBI Magnum ESG Fund and ICICI Prudential ESG Fund exhibit higher Sharpe Ratios (0.68 and 0.66 respectively) and Alpha (>2%), demonstrating their superior risk-adjusted efficiency. The average Sharpe Ratio for sustainable funds was 0.63 compared to 0.58 for traditional funds. Similarly, average Alpha for ESG funds stood at 1.91%, slightly higher than 1.76% for conventional funds. This suggests that ESG-focused strategies may offer better reward-to-risk performance in the Indian mutual fund context.

In table 2 analysed the Beta values for ESG funds average around 0.90, suggesting lower sensitivity to market movements compared to traditional funds, which average around 1.05. A lower Beta reflects a more defensive investment profile, which can be attractive during volatile market periods. In contrast, traditional funds demonstrate higher market responsiveness, implying greater exposure to systemic risk. While ESG funds show slightly higher standard deviations (~14.1% vs. 13.2%), this is acceptable given their active ESG mandates and concentrated sectoral themes. Overall, ESG funds exhibit more stable behaviour, balancing returns and volatility efficiently.

TABLE II MARKET RISK INDICATORS

S. No	Fund Name	Type	Beta	Standard Deviation (%)
1	SBI Magnum ESG Fund	Sustainable	0.88	13.9
2	Axis ESG Equity Fund	Sustainable	0.91	14.2
3	ICICI Prudential ESG Fund	Sustainable	0.9	14.1
4	Quantum India ESG Equity Fund	Sustainable	0.92	14.4
5	Aditya Birla SL ESG Fund	Sustainable	0.91	14.3
6	Kotak ESG Opportunities Fund	Sustainable	0.89	13.8
7	Mirae Asset ESG Leaders ETF	Sustainable	0.89	13.7
8	Tata ESG Fund	Sustainable	0.9	14
9	Motilal Oswal MSCI ESG Fund	Sustainable	0.93	14.6
10	Mahindra Manulife ESG Fund	Sustainable	0.91	14.2
11	SBI Bluechip Fund	Traditional	1.07	13.4
12	Axis Bluechip Fund	Traditional	1.06	13.3
13	ICICI Prudential Bluechip Fund	Traditional	1.05	13.2
14	HDFC Equity Fund	Traditional	1.08	13.5
15	Nippon India Large Cap Fund	Traditional	1.02	12.8
16	Mirae Asset Large Cap Fund	Traditional	1.04	13.1
17	Tata Large Cap Fund	Traditional	1.05	13.3
18	Kotak Standard Multicap Fund	Traditional	1.06	13.2
19	Aditya Birla SL Frontline Equity	Traditional	1.03	13
20	UTI Nifty Index Fund	Traditional	1.02	12.7

Source: Own calculation

TABLE III LONG-TERM PERFORMANCE – 5-YEAR CAGR

S. No	Fund Name	Type	CAGR (%)
1	SBI Magnum ESG Fund	Sustainable	11.5
2	Axis ESG Equity Fund	Sustainable	10.9
3	ICICI Prudential ESG Fund	Sustainable	11.2
4	Quantum India ESG Equity Fund	Sustainable	10.8
5	Aditya Birla SL ESG Fund	Sustainable	10.6
6	Kotak ESG Opportunities Fund	Sustainable	10.7
7	Mirae Asset ESG Leaders ETF	Sustainable	11.1
8	Tata ESG Fund	Sustainable	10.5
9	Motilal Oswal MSCI ESG Fund	Sustainable	10.7
10	Mahindra Manulife ESG Fund	Sustainable	10.6
11	SBI Bluechip Fund	Traditional	10.2
12	Axis Bluechip Fund	Traditional	10.4
13	ICICI Prudential Bluechip Fund	Traditional	10.3
14	HDFC Equity Fund	Traditional	10.1
15	Nippon India Large Cap Fund	Traditional	9.8
16	Mirae Asset Large Cap Fund	Traditional	10
17	Tata Large Cap Fund	Traditional	10.3
18	Kotak Standard Multicap Fund	Traditional	10.2
19	Aditya Birla SL Frontline Equity	Traditional	10
20	UTI Nifty Index Fund	Traditional	9.9

Source: Own calculation

V. CONCLUSION

The research demonstrates how sustainable (green) mutual funds outperform traditional equity mutual funds within the Indian market from 2020 to 2024. The results show sustainable funds produce improved risk-adjusted performance because they demonstrate higher Sharpe Ratios and Jensen’s Alpha alongside lower market reaction which makes them resistant to market fluctuations. Sustainable funds demonstrate higher risk levels but deliver outstanding Compound Annual Growth Rates (CAGR) which reach over 11% in top-performing funds such as SBI Magnum ESG Fund and ICICI Prudential ESG Fund thus indicating strong financial prospects. Sustainable investment funds prove capable of achieving good returns alongside meeting all sustainability criteria. Green finance continues its growing importance according to the research since sustainable mutual funds demonstrate ability to deliver both financial sustainability and consistent long-term market growth in emerging markets.

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