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ESG Performance Greenwashing and Financial Transparency Implications for Sustainable Growth

Dr. Mukesh Kumar Kumawat

mukesh.kumawat@jaipur.manipal.edu

Manipal University Jaipur

Research Article

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Dr. Mukesh Kumar Kumawat*

Abstract: -

Environmental, Social and Governance (ESG) reporting practices are the most vital compliance that can change the entire global picture for inclusive and sustainable growth in present scenario. The growing emphasis on ESG reporting has transformed the landscape of financial disclosure and accountability related to corporates. However, the increasing number of greenwashing and fraudulent information related to their sustainability performance poses significant challenges to credibility of ESG reporting. The present research examines the relationship between ESG reporting quality, fraud risk and greenwashing practices and assesses their implications for financial transparency and sustainable economic growth in line with Sustainable Development Goal 8 (SDG 8). The present research highlights how weak reporting of ESG and information asymmetry can facilitate manipulation in the achievement of SDG-8 and having the impact on financial and operational efficiency of organizations. The present research further discusses the role of proper ESG reporting with context to sustainable growth can reduce the fraud and greenwashing practices in ESG reporting. The findings of present research suggest that strengthening regulatory compliance, enhancing disclosure standards and integrating different techniques into ESG evaluation can significantly reduce the greenwashing practices in ESG reporting. The present research also contributes to literature linking ESG integrity with fraud detection practices and sustainable economic results, suggesting valuable insights for policymakers, regulators, and corporate stakeholders.

Keywords: - ESG Reporting, Fraud Detection, Greenwashing, Sustainable Development Goal 8 (SDG-8), Financial Transparency

Introduction:

* **Assistant Professor, Dept. of Commerce, Manipal University Jaipur, Jaipur, Rajasthan-India**
Mail:- mukesh.kumawat@jaipur.manipal.edu

Environmental, Social and Governance (ESG) reporting practices are the most vital compliance that can change the entire global picture for inclusive and sustainable growth in present scenario. The growing emphasis on ESG reporting has transformed the landscape of financial disclosure and accountability related to corporates. However, the increasing practices of greenwashing and fraudulent information related to their sustainability performance poses significant challenges to credibility of ESG reporting practices opted by the companies. In the increasing demand of standardized ESG reporting to assess companies' actual compliance related to environmental, social and governance criteria, now development as the significant factor of sustainability reporting practices. ESG reporting practices essentially consider the practical real action taken, their results and organization's' system for governance that show organization's actual compliance for sustainability (Linnenluecke, 2022).

In today's dynamic world where profit-oriented organizations weakening natural resources, human resources, stakeholders' interest in their operating; create challenges for SDG-8 agenda. That's why the increasing significance of ESG practices aligns with the sustainable development agendas specially with relation to SDG-8, which mainly focuses on sustainable development with economic growth, accountability in business practices and productive employment. In the rapidly growing business activities with the rise of ESG reporting practices, the challenges have increased regarding the credibility and reliability of reporting practices. A significant issue is the frequency of greenwashing, where many companies intentionally or unintentionally disclose their unreal environmental or social performance to create a good favorable image in front of public. As per the outcomes of many organizations reflects that ESG associated investment has reformed expectations for accountability and transparency in the reporting practices by the organization because all the related stakeholders including policymakers, investors and other stakeholders are increasingly looking for robust sustainability reporting practices, recognizing its strengths to find non-financial risk and opportunities of organizations that conventional accounting methods may overlook (Eccles, Ioannou, & Serafeim, 2014).

The insecurity for ESG washing practices and preference about standard mandatory disclosures may be broadly shared across different social groups, possibly showing the persistent public discourse and sharp awareness related to sustainability reporting practices in past years (al. S. K., 2016). As per generally accepted assumptions, in organizations quality ESG reporting should

promote each related stakeholder to take more informed decisions, help in proper flow of capital with adequate sustainable business practices, and raise the long-term value creation for the organizations. In the general reporting practices of ESG, coincidence of voluntary disclosure procedures and shattered standards of global reporting has left significant space for selective and sometimes, misleading flow of information of ESG reporting (Boiral & Heras-Saizarbitoria, 2020).

With the continuously emerging practice of corporate social responsibility can explore more rapidly by cloning extant misappropriation or fraud resistance tools for the organizations. This is specifically noticeable given the growing number of legal procedures are showing to both sustainability practices and reporting of these practices from organizations, as demonstrated in guidelines and cases over the past years (Kurpierz & Smith, 2020).

In present scenario growing practices of fintech significantly suppress the issues related to corporate strategic environmental, social and governance (ESG) behaviors' (CSB). During ESG reporting repressive impact on greenwashing practices is significantly stated, its impact of the practices related to brown washing stays empirically uncertain. The results of mechanism analysis reflect that this effect functions through both funding and mediums related to governance practices. With the help of fintech organizations also get the help to correct the structural deviations or differences essential in general old practices of finance and provide a gap-filling function in different regions with less developed financial structure (al. W. D., 2026).

As per different studies on financial and operational performance especially in many Asian developing countries including India, ESG practices manage to disclose subdued irregular results except accompanies with the help of authentic efficiency reflectors related to organizations, advising that stakeholders including investors stay vigilant.

With the proper ESG practices with the reference to SDG-8, investors can take the advantage from ESG reporting to recognize presence of long-term opportunities and risk, real adoption of transparent information into informed decision-making which heavily depends on the credibility of data, clarity of regulatory compliance and customer preferences-factors are often overlooked in a highly regulated capital market. The fundamental objective of the study to check the reality of ESG impact on financial and operational performance of companies with the relation to fraud detection and green washing practices opting by the organizations.

Literature Review and Research Gap:

Existing literature highlights that ESG performance is generally associated with improved corporate governance, reduced information asymmetry, and enhanced firm value. However, recent studies indicate that the absence of standardized reporting frameworks and weak regulatory enforcement can create opportunities for manipulation in ESG disclosures. In ESG reporting, greenwashing has been considered as main emerging issue, mainly in industries where sustainability claims are difficult to verify and transparency & accountability also missing in reporting practices.

In the reporting practices, existences of convergence and divergence in ESG and other non-financial disclosures also show that only proper reporting practices related to sustainability are not only universal standard reporting practices but an emerging and growing area under organizational forces meet with strategic discretion. Awareness of this concern is necessary for reviewing how integrated reporting develops as both a regulatory compliance and good flow of information in the financial industry (al. A. A., 2026).

The sustainability development goals (SDGs) show the increasing essential understanding among people of whole globe mainly in the areas with more economic and social standard of living. With reference to these contexts, a future oriented target or vision of the organization contributed to human well-being development, with the benefits of individuals, in comparison to different factors of economic activity. In the present scenario this perception about SDGs is well established among international managerial community with applicability of controlling values that influence companies actions, including growing numbers of nonfinancial perspectives in reporting practices (Elkington, 1994).

In reality ESG high score are positively associated with lower cost of debt financing. ESG reporting quality positively strengthens the association between lower costs of debt financing and investment efficiency. Both overinvestment and underinvestment are mitigated in firms with lower debt financing costs and high-quality ESG disclosures (al. P. K., 2026).

As per different studies, brand value has the impact of many factors, so ESG score does not have significant impact on brand value but when considering the moderating effects of bank size and

risk, a significant positive relationship emerges in many banks. The results also reveal that large and risky banks, ESG good compliance positively affects brand value of the bank. Analyzing the individual ESG pillars' impact shows that only the governance pillar is the most influential factor in this effect. Results are robust to different controls (Cuomo & D'Amato, 2026). ESG disclosures are positively associated with firm valuation and institutional capital allocation, but primarily in countries with higher quality of governance. Environmental scores exert the strongest and most consistent influence. Interaction models confirm that governance strength enhances the signaling power of ESG, while weak institutions dilute market responses (L. K. David et al., 2025).

In emerging markets, the main target of ESG financing is to safeguard investments that are efficiently profitable with the proper compliance with ethical standards, sustainable and socially sustainable criteria. The increasing demand for sustainable investments from different stakeholders has resulted in an enhanced requisition for ESG compliance to effectively remove different types of practices that create adverse impacts on reporting practices such as greenwashing and fraud practices. This type of regulatory compliance commands institutions to release detailed reporting on risk mana, scenario analysis, governance, strategy management and different types of metrics. Orgnizations can use the suggested framework for actual information, strengthening transparency and standard compliance which is critical to effective prevention from greenwashing practices in their reporting practices (Poiriazi, 2025).

In the reporting practices by companies, fraud and greenwashing endure an important trouble whenever information related to ESG practices is disclosed in a wrong or misleading manner. This type of practices in reporting known as “greenwashing” and it stays even though it is obligation that ESG reporting practices be dependable, truthful, evidence supported, comparable and answerable. The presence of greenwashing and fraudulent practices in ESG reporting practices are compromised which weakened related stakeholders’ belief in disclosed data that has been presented unreal picture of organization (Birindelli, 2023).

In developed countries, an extensive authority of research creates association between ESG performance to value of firm and capital reallocation that is very rare for comparison from developing economies (Fang, 2025).

In India the regulation related compliance advocated for compulsory ESG reporting, especially with the Business Responsibility and Sustainability Reporting (BRSR) framework. Over the period

in the impact of BRSR standards, Indian companies are gradually line up with global ESG standards at least formally. Conversely, the impact of compliance driven reporting does not inevitably impact on credibility or investor's trust, particularly in the different industries with limited ESG audit transparency (Safitri et al., 2025).

In the organizations ESG adoption is repeatedly driven by the policies of government, considering environmental cleanup and technological adaptation, still the reporting practices by the organization's having deviations across the different sector, industries and regions (Li et al., 2025).

All the regulatory activities, in the absence of standardized authentication procedures, ESG outcomes reflectors in developing economies may not be true and reliable priced into equity or debt instruments of capital (Fiorillo et al., 2025).

The perceptions regarding comfort and risk related to investment by lender and investors' influenced by different types and visibility of ESG reporting with the use visualize disclosures in non-financial reporting (Nicolo et al., 2025). Employment status and education facilitate ESG adoption through stability and social learning mechanisms, whereas investment experience paradoxically generates both sophisticated awareness and fundamental skepticism. Critically, performance perceptions emerge as the primary determinant mediating demographic influences on ESG preferences, establishing that sustainability investment behaviour is instrumentally rational rather than value-expressive in emerging markets (al. B. A., 2026).

The reliability of ESG reporting differs significantly across economies, industries, company size, nations, capacity of governance and scrutiny of related stakeholders rather than disclosure strength only. In the practice of ESG reporting creates firm-level disclosure imbalance as a significant mechanism underlying the risk of greenwashing and it also introduces an ESG-integrated, NLP based framework the advances both the theoretical and methodological treatment of greenwashing as a governance wonder rather than a marketing irregularity (al. I. B., 2026). In the last decade increasing demand for sustainability reporting has led to a complex landscape of ESG disclosure frameworks, necessitating a comprehensive understanding of their interconnections (Safas, 2026).

While several studies have examined ESG practices and their role in sustainable growth, the limited studies integrated ESG practice's impact on financial and operational performance with reference to fraud detection and green washing. The different studies show that the linkage between

ESG related fraud and broader sustainable development outcomes, particularly SDG-8, also remains underexplored. The different studies and recommendations also show that there is a lack of detail comprehensive framework that contains fraud detection and greenwashing detection techniques. As per this research gap in scope of present study and existing literature; this paper mainly focuses on impact of ESG reporting on financial and operational performance in selected companies and focuses on how robust ESG reporting can contribute to reduce fraud and greenwashing practices in reporting practices that will provide help to achieve target of SDG-8 with.

Research Problem and Objectives:

In today's dynamic world where different types of challenges coming Infront of entire world related to climate change, global warming, concentration in natural resources, decreasing level of social structure, unstable economies and low levels of corporate governance, ESG practices are the needs which can enhance the level of robustness of practices related to environment protection, corporate social responsibility and good governance in organizations. Under the ESG practices which focuses on enhanced transparency, accountability and better governance, but the absence of uniform measurement frameworks and poor mechanisms creates situations for manipulation in reporting, and this is the basically reason behind raises concerns regarding the integrity of sustainability disclosures. This paper addresses the gap by examining the relationship between ESG reporting, greenwashing practices and fraud detection. The present research paper has the following objectives: -

- To analyze the ESG disclosures and ESG score in corporate reporting for selected companies.
- To explore the impact of ESG reporting on financial performance of organizations.
- To discuss the greenwashing and fraud practices in ESG reporting.
- To assess the implications of ESG transparency on sustainable economic growth (SDG-8).

Research Methodology:

This study adopts a conceptual and analytical research approach, supported by secondary data and existing literature. It proposes the use of quantitative techniques for empirical validation, including descriptive statistics and ANOVA analysis. The present research considering evidence of ESG reporting of top 100 companies of India as per market capitalization as on 1st April 2026. To assess financial performance through data analysis financial data of selected companies obtained from their annual reports for the year 2025-26. ESG scores of selected companies obtained from NSE reports that can be used to measure disclosure quality. Strong Financial and operational performance which also indicates the absence of fraud and green washing practices in the organizations may derive from information related Return on Assets and Return on Equity variables with help from financial reports of selected companies.

Research Hypothesis:

H_0: - ESG practices have no significant impact on financial performance (ROE) and operational efficiency (ROA) of selected companies.

H_1: - ESG practices have significant impact on financial performance (ROE) and operational efficiency (ROA) of selected companies.

Fraud and Greenwashing in ESG Reporting:

The widespread occurrence of different types of forms of ESG fraud, such as greenwashing, misreporting of social compliance, and manipulation of governance, affirming the considerable threat that fraud presents to the integrity of ESG commitments (Hossain, 2025). Factors including the level of competition, pressure from rating agencies, pressure from banking companies and few others can lead to fraud practice in financial transactions and greenwashing behaviour that reduce the impact of ESG reporting in organization (Ruben Pop, 2025).

Generally, greenwashing activities arise when companies misrepresent their environmental practices to create more positive image among all stakeholders. Many times, these types of practices related to greenwashing sometimes appear as minor and difficult to find in reporting and have very significant consequences for stakeholders' trust and market. When we look according to

governance perspective, greenwashing shows an information gap between companies which have greater control over how their sustainability practices are presented and related stakeholders, who generally do not have option to verify these reporting reflects actual sustainability practices or not (Jeevan, 2017).

According to the (Gorovaia, 2025), in many cases CSR reports find that companies with environmental violations or exploitation generally mention longer, more positive, lengthy and less readable reports, especially just after violation of policies. Many responsible companies exploit the unregulated, unaudited state of CSR reporting as a greenwashing medium that hides the true financial view of the companies. (Manuel C. Kathan, 2025) mentioned that ESG scores attain greenwashing risk rather than real environmental performance. This study shows that greenwashing accusations are more common among large companies with high ESG scores, and that ESG scores align positively with apparent environmental performance but in reality, it impacts on environment negatively.

In the reporting practices, the absence of standard uniform guidelines for reporting on environmental, social and governance issues, the spread of non-financial transactions across the different sources, and the absence of reliable and complete data sets confound the quantification of elements of activities of organizations. Along with this massive volume of longitudinal data and sustainability reports make the assessment of greenwashing very lengthy (Aronczyk, 2024). (Wang, 2024) suggest a proper evaluation of different elements that give contribution to greenwashing, highlighting the importance of key internal and external variables.

According to (Chueca Vergara C, 2021) the association among finance with sustainable practices and greenwashing is basically a complicated concern which is guided by variation of theoretical foundations, methodologies and perception. In the actual point of view, it is commanding to understand the correlation between sustainable finance and technological innovation like the fintech or application-based methods related to finance. The innovation related to fintech and digital financial solutions has the potential to decrease greenwashing activities by increasing practices with transparency and protecting customers. (Maxwell, 2011) discuss the incentives for firms to engage in greenwashing, they also highlight the role of external scrutiny, including by analysts, in mitigating such behavior. (Peng, 2024) stated that greenwashing can hinder real possible sustainable development by distracting available resources from actual sustainable

development endeavors. Peng stated that greenwashing may result in unreal or misleading sustainability practices that can be possible reason for inefficient use of available resources. These types of practices show that greenwashing can result in uncertainty and distrust among related stakeholders with the restricting actual implementation of sustainable practices.

With the help of quasi-natural experiment (Tingcheng Mo, 2026) finds that mandatory ESG disclosure in Hong Kong/China significantly increased greenwashing with the help of fraud-triangle mechanisms, external pressure, regulatory arbitrage and tone manipulation. Greenwashing is a multifaceted issue that may manifest in many forms, shapes, and intensities. This obstructs the advancement of technologies for prevention, measurement, and detection. Furthermore, greenwashing adversely affects sustainable finance, particularly green loans and bonds and the findings indicate that corporate greenwashing is a distinct kind of greenwashing (Ragazou, 2025). (Curtis Farnsel, 2025) finds that ESG reporting gaps to fraud risks such as misreporting, greenwashing, data manipulation and caron credit misrepresentation. In the presence of weak measurement standards, limited training and thin oversight leave ESG reporting vulnerable to abuse.

Data Analysis and Interpretation: -

This is the data ESG of selected NSE 100 companies as per the market capitalization. The data shows details about the ESG score out of 100 with their category as per this likert scale (Range of score category 0-40 Weak, 41-50 Below average, 51-60 Adequate, 61-70 Strong, 71-100 Leadership). Along with the ESG score to evaluate financial performance of selected organizations the ROA & ROE also collected from the financial statements for the year 2025-26. The data related to ESG score, category, ROA & ROE analyzed with the help of statistical tools.

S.No.	Name of Company	ESG Score	Category	ROA	ROE
1	Reliance Industries	61	Strong	4.33	8.4
2	HDFC Bank	73	Leadership	1.7	13.78
3	Bharti Airtel	77	Leadership	5.35	23.18
4	SBI	73	Leadership	1.15	17.2

5	ICICI Bank	78	Leadership	2.09	16.08
6	TCS	73	Leadership	30.95	51.81
7	Bajaj Finance	77	Leadership	3.99	19.22
8	Larsen & Toubro	61	Strong	4.98	16.55
9	Infosys	80	Leadership	18.62	28.83
10	Life Insurance	67	Strong	0.87	45.72
11	Hind. Unilever	74	Leadership	13.19	20.72
12	Maruti Suzuki	73	Leadership	11.69	15.89
13	Axis Bank	77	Leadership	1.78	16.3
14	Sun Pharma Industry	61	Strong	12.97	16.86
15	Titan Company	69	Strong	9.24	31.75
16	M & M	74	Leadership	5.51	18.05
17	HCL Technologies	78	Leadership	16.95	25
18	ITC	66	Strong	22.16	27.32
19	Adani Power	65	Strong	12.46	26.1
20	NTPC	60	Strong	4.6	13.1
21	Kotak Mah. Bank	73	Leadership	2.68	15.37
22	Adani Ports	66	Strong	8.59	18.76
23	O N G C	61	Strong	5.15	10.63
24	UltraTech Cem.	61	Strong	5.19	9.29
25	Bharat Electron	65	Strong	13.21	29.22
26	Vedanta	57	Adequate	9.77	38.48
27	JSW Steel	63	Strong	1.65	4.94
28	Avenue Super.	72	Leadership	11.86	13.44
29	Power Grid Corporation	70	Strong	5.91	17
30	Bajaj Finserv	71	Leadership	2.96	13.39
31	Hind Aeronautics	61	Strong	8.82	26.07
32	Adani Enterp.	68	Strong	2.76	9.82
33	Bajaj Auto	70	Strong	15.63	22.77
34	Coal India	58	Adequate	14.25	38.89

35	Tata Steel	63	Strong	1.22	3.89
36	Hindustan Zinc	67	Strong	30.23	72.42
37	Nestle India	67	Strong	27.1	83.02
38	Shriram Finance	72	Leadership	3.04	15.57
39	Eternal	77	Leadership	1.47	1.71
40	Asian Paints	70	Strong	13.18	20.59
41	Hindalco Inds.	69	Strong	6.51	14.02
42	Wipro	75	Leadership	9.83	15.45
43	I O C L	63	Strong	2.47	6.51
44	SBI Life Insurance	76	Leadership	0.56	15.13
45	Eicher Motors	69	Strong	18.85	24.1
46	Adani Green	78	Leadership	2.32	14.61
47	Grasim Inds	64	Strong	1.69	3.95
48	Interglobe Aviat	60	Strong	5.89	103.8
49	TVS Motor Co.	73	Leadership	5.15	28.39
50	Divi's Lab.	66	Strong	13.53	15.35
51	ICICI AMC	64	Strong	70.34	85.8
52	Tata Motors	71	Leadership	6.39	23.18
53	Varun Beverages	64	Strong	12.16	16.21
54	Jio Financial	76	Leadership	1.04	1.19
55	Hyundai Motor I	76	Leadership	19.97	42.18
56	Power Fin.Corpn.	73	Leadership	2.75	21.01
57	Adani Energy Sol	71	Leadership	3.37	13.64
58	DLF	63	Strong	7.3	11.36
59	ABB	76	Leadership	12.83	22.39
60	Tech Mahindra	77	Leadership	9.04	14.62
61	Trent	67	Strong	17.32	30.4
62	Bank of Baroda	66	Strong	1.18	15.53
63	Union Bank (I)	68	Strong	1.24	17.05
64	BSE	71	Leadership	14.03	36.04

65	Tata Capital	57	Adequate	1.72	12.92
66	Muthoot Finance	61	Strong	4.67	19.58
67	Cummins India	71	Leadership	20.85	28.15
68	Pidilite Inds.	71	Leadership	16.22	23.05
69	Torrent Pharma.	70	Strong	13.26	26.52
70	LTM	75	Leadership	15.83	21.53
71	Britannia Inds.	67	Strong	24.52	52.94
72	I R F C	60	Adequate	1.34	12.77
73	Tata Power Co.	64	Strong	3.05	10.97
74	Solar Industries	68	Strong	19.54	32.64
75	B P C L	64	Strong	6.46	17.31
76	Cholaman.Inv.&Fn	71	Leadership	2.38	19.71
77	HDFC Life Insur.	75	Leadership	0.52	11.28
78	Tata Motors PVeh	64	Strong	7.65	28.08
79	Samvardh. Mothe.	68	Strong	4.6	12.16
80	Punjab Natl. Bank	66	Strong	1.07	15.17
81	Siemens Ltd	71	Leadership	7.46	11.81
82	Jindal Steel	59	Adequate	4.33	7.68
83	Canara Bank	70	Strong	1.08	17.75
84	Hitachi Energy	62	Strong	5.77	13.79
85	Indian Bank	64	Strong	1.35	17.09
86	Polycab India	68	Strong	15.15	21.44
87	CG Power & Ind	67	Strong	14.53	27.66
88	HDFC AMC	74	Leadership	30.51	32.93
89	Bajaj Holdings	62	Strong	9.32	11.01
90	Ambuja Cements	65	Strong	7.02	8.73
91	Godrej Consumer	74	Leadership	9.93	15.21
92	Apollo Hospitals	71	Leadership	7.77	18.42
93	Bosch	74	Leadership	10.7	15.55
94	B H E L	59	Adequate	0.81	2.12

95	Tata Consumer	62	Strong	4.26	7.01
96	Indus Towers	70	Strong	16.26	32.5
97	Mazagon Dock	66	Strong	8.28	34.02
98	GAIL (India)	66	Strong	8.23	13.09
99	Lupin	71	Leadership	12.41	20.62
100	Hero Motocorp	75	Leadership	15.62	23.06

Sources: - NSE ESG Ratings-2025, Crisil Ratings and Annual Reports of Companies

Link:- https://www.nse-esgrating.com/esg-ratings

https://www.crisilesg.com/en/home/esg-ratings.html

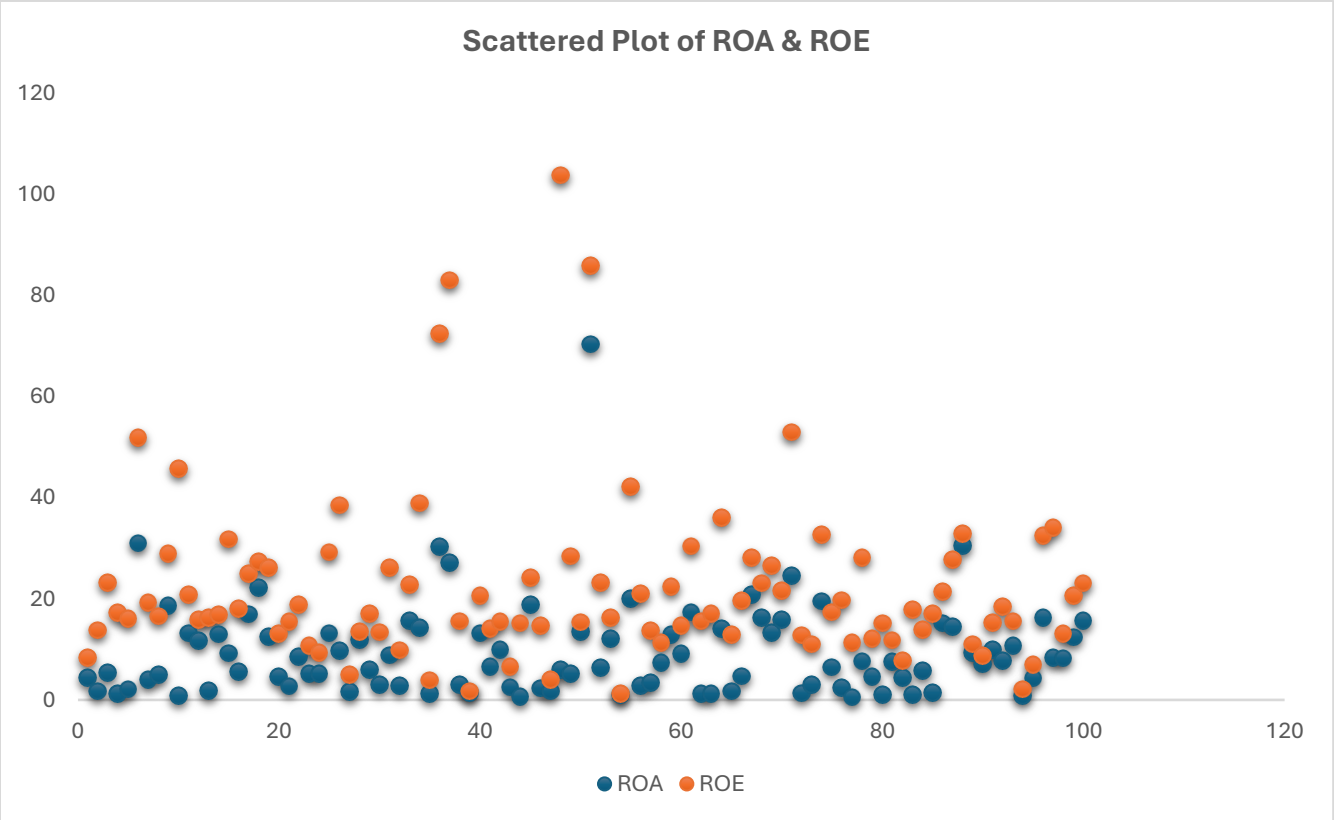
The above tables represent data of top 100 companies as per market capitalization from National Stock Exchange of India. The study evaluates the sustainability and financial performance of selected companies using environmental, social and governance (ESG) score along with data related to financial performance namely return on assets (ROA) and return on equity (ROE). The ESG score has been classified into five categories to facilitate comparative analysis of selected companies.

The category-wise data of selected companies reveals considerable variation in ESG score indicating differing levels of ESG practices, adoption and disclosure practices across sectors. As per ESG score significant proportion of selected companies concentrated to strong and leadership categories, which means leading listed top companies in India are increasingly integrating sustainability, social and governance principles into their operating strategies and planning frameworks. However, as per the data few selected companies belong to adequate category as ESG score which highlights opportunities for improvement in ESG reporting and implementation.

According to the results of financial performance, the outcome shows a significant variation in all the categories of selected companies as ESG score. The data on Return on Assets shows the significant variation in operational efficiency and utilization of assets while data on Return on Equity shows different significant levels of shareholders' return across all categories of companies. As per the insight of this data related to all companies; data shows that companies which classified under higher ESG categories generally have good financial performance in terms of profitability

in comparison to companies with lower ESG categories this is also reflecting higher average of return on assets with efficient utilization of assets with sustainable corporate practices.

Similarly, higher ROE values show among several companies in strong & leadership suggest that enhanced ESG practices may contribute positively to shareholder wealth creation and investor confidence. In contrast, companies related to adequate ESG category exhibit comparatively lower or inconsistent financial performance indicators, suggesting that limited sustainability engagement may affect financial performance, market perception or long-term financial resilience. As per overall observations of top 100 companies shows a positive association between ESG practices and financial performance. The observed pattern suggests that organizations with stronger ESG scores tend to demonstrate better profitability and stronger financial positioning, thereby supporting the strategic importance of sustainability practices in enhancing financial performance and long-term sustainability with value creation.



Interpretation: - The above scatter diagram shows the relationship between returns on assets and returns on equity of top 100 listed companies. This graphical representation provides a visual

understanding of the association between assets utilization efficiency and shareholder profitability among the selected companies. The scatter plot shows positive upward trend between ROA and ROE, indicating that companies with higher Return on assets generally tend to report higher Return on equity. This pattern implies that selected companies utilizing their assets efficiently are also able to generate good returns for the shareholders, reflecting effective financial performance and operational efficiency. According to the data of ROA and ROE, most of selected companies appear clustered within the moderate values related to financial performance and operational efficiency in terms of ROA & ROE.

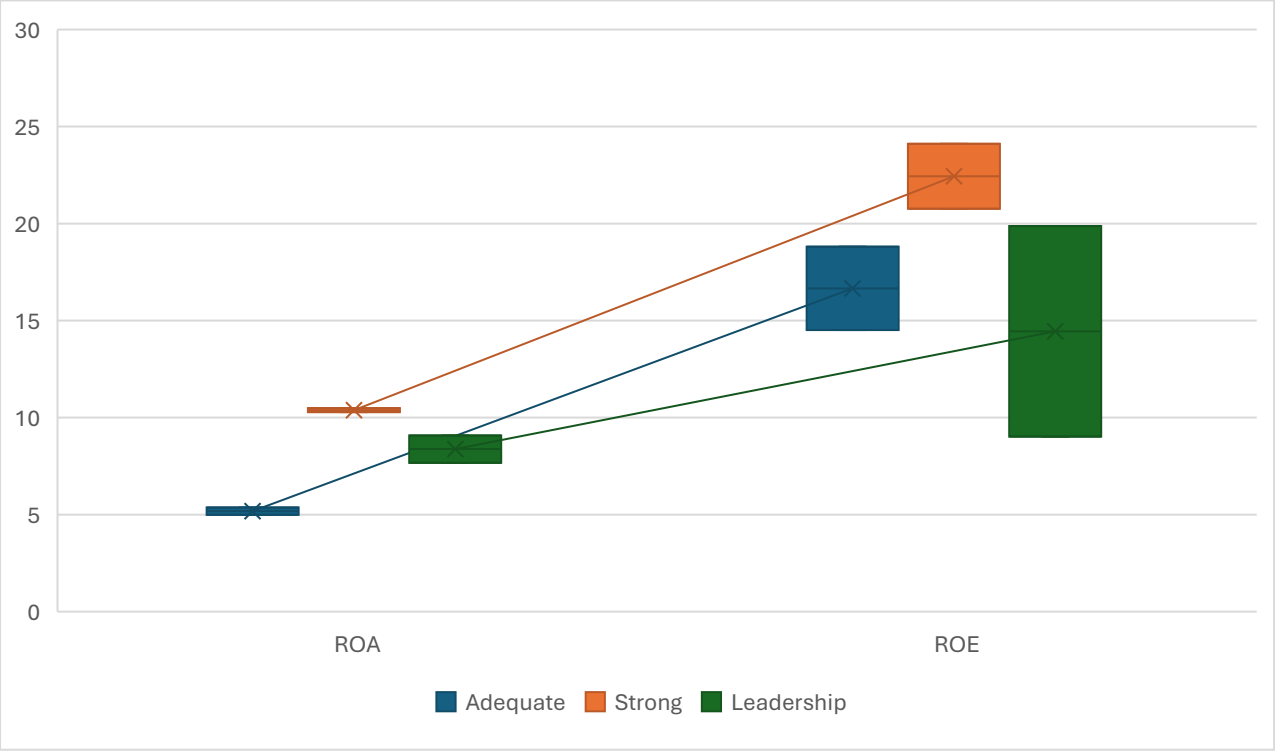
However, a few selected companies located away from the main cluster, representing outlier with exceptionally high or low financial and operational efficiency levels. This type of differences in financial and operational efficiency may be attributed to differences in industry characteristics, capital structure, operational strategies and market positioning. The dispersion of points also suggests that although a positive relationship exists, the strength of association may differ across category of companies. Some companies with relatively moderate ROA exhibit higher ROE, which may be influenced by financial leverage, equity structure or capital management practices opted by companies. Similarly, a few selected companies with strong operational performance may show comparatively lower ROE due to conservative financing policies.

Descriptive Statistics of Selected Companies Company as Groups by ESG Category: -

For better understanding of collected data of NSE 100 companies, the data group in three categories with the name of Adequate, Strong and Leadership according to their ESG score. The data shows that only 6 companies belong to adequate group and remaining 53 companies are related to strong group and 41 companies related to leadership group.

Category of Companies as per ESG Score	Mean		SD	
	ROA	ROE	ROA	ROE
Adequate	5.37	18.81	4.99	14.51
Strong	10.28	24.11	10.49	20.76
Leadership	9.08	19.87	7.67	9.02

Interpretation: - The data of NSE 100 companies has a high level of variability in ESG score of selected companies. According to the data collected we find that mean of ESG score is relatively more consistent but standard deviation (SD) shows the more spread out from average ESG score. As per the analysis we find that SD 4.99 shows the less spread out from average in adequate group of companies, but SD 10.49 for ROA shows high level of dispersion in the ESG score of companies of strong group. This is mainly due to few extremely high ESG scores in the data set which significantly increase the variability of strong group, and we can say that SD value not mostly clustered around the mean, showing inconsistency or volatility in the observed values. Similarly, SD for ROE for strong group is 20.76, showing a high level of dispersion in the dataset due to the influenced by high extreme values in ESG score. The SD for the leadership group of companies is 7.67 shows the moderate level of dispersion in the dataset and although most of values in this category are clustered around the average value with reasonable consistency with slight fluctuations.



As per this figure we find that there is significant difference between descriptive statistics for all groups of companies as per their ESG score. The result shows that the mean value for return of

Assets (ROA) having the high difference between adequate group to leadership category of companies which means the ESG score has the positive impact on financial performance which is reflected in the form of return of assets. Similarly, ESG score shows the significant positive impact of return of equity also because companies having good ESG score in the category of strong in comparison to companies related to adequate group.

The data of ESG score shows that companies classified under different categories as per ESG score showing the noticeable difference between in their financial performance in terms of return of assets and return of equity. Firms in the group of 'Strong' exhibit the highest average of profitability, with both return of equity and return of assets outperforming the other groups. This suggests that companies with high ESG practices and scores tend to achieve better financial outcomes. Companies in the category of 'leadership' also show relatively high performance, though slightly lower than the 'Strong' category of companies. However, their variability, especially in ROE, appears more controlled, showing more stability compared to other categories of companies. And the companies categorized as 'Adequate' record the lowest average returns, implying comparatively weaker financial performance in terms of return on assets and return on equity. So, as per outcomes find that there is a positive relation between high ESG score and financial performance with some variation in stability across all categories. Overall, high ESG scores and improved practices appear to play a vital in enhancing financial performance while required effective management for stability.

Comparing Operational Efficiency (Return of Assets) as per ESG score:

Groups	**Count**	**Sum**	**Average**	**Variance**		
Adequate	6	32.22	5.37	29.9306		
Strong	53	544.8	10.27925	120.7395		
Leadership	41	372.46	9.08439	60.43967		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	141.6035	2	70.80176	0.776397	0.462898	3.090187
Within Groups	8845.692	97	91.1927			

Total	8987.295	99				

Interpretation: -

The ESG reporting practices has a good environment for doing operating activities of organization that creates positive impact on the financial performance of the organization. A one-way analysis of variances (ANOVA) conducted to examine whether financial performance differs significantly across ESG score categories. The purpose of this analysis is to assess whether variations in ESG practices are associated with differences in companies' financial performance and assets utilization efficiency. The ANOVA results ($p>0.05$) indicate the mean ROA values differ across categories of companies as ESG score, suggesting that companies with different level of environmental, social and governance practices may exhibit different financial results for selected companies in this presented research. The significance value ($p>0.05$) shows that the difference between mean ROA across all ESG categories are not statistically significant. This suggests that although selected companies may differ in their ESG scores, such differences do not translate into substantial differences in assets-based profitability within all selected companies. In as per the result, we find that the null hypothesis is accepted, showing that ESG classification alone may not be sufficient determinant of ROA, and other companies related factors such as their capital structure, company size, industry nature, operational efficiency, market positioning and market conditions may play a dominant role in influencing profitability.

Comparing Financial Performance (Return of Equity) as per ESG score;

Groups	**Count**	**Sum**	**Average**	**Variance**		
Adequate	6	112.86	18.81	252.7444		
Strong	53	1277.76	24.10868	429.9981		
Leadership	41	814.69	19.87049	86.5145		
ANOVA						
Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Between Groups	482.3683	2	241.1842	0.863783	0.424781	3.090187
Within Groups	27084.21	97	279.2186			

Total	27566.57	99				

Interpretation: -

According to the ANOVA analysis for return on equity and ESG score shows that different categories of companies as per ESG score have different levels of ROE. The ANOVA results ($p>0.05$) shows that the mean ROE values of selected companies differ across different categories of companies as ESG level, which directly showing that ESG practices do not have significant impact on financial performance. The significance value of this analysis ($p>0.05$) reflects the difference between ROE and ESG score across all categories of selected companies, but their impact is not significance. This shows that ESG scores cannot individually be able to create variations in financial performance of selected companies because of profitability dependence on many factors such as capital structure, market conditions, market share, company's size and industry characteristics; these all having more significant impact on financial performance. As per the outcomes of analysis; the results show that p-value exceeds 0.05, that's why null hypothesis is accepted which indicates that ESG score has not had significant impact on return on assets and return on equity of selected companies.

Major Findings and Conclusion:

Under the present study the ESG score and their relationship with financial performance of top 100 companies of NSE as per market capitalization is tested and the results shows outcomes beyond the general assumption about the practices of ESG by the companies, compliance by government regarding reporting related to environmental, social and governance related activities has the high significant impact on profitability as well operational efficiency. As per the findings we find that ESG score varied considerably among the top 100 NSE companies, which is showing the different levels of practices opted by the companies regarding sustainability practices. The data shows that companies categorized under the category of leadership and strong groups mostly show relatively high financial performance in comparison to companies related to adequate category. The data analysis suggests that effective implementation of ESG related activities can contribute to improved corporate goodwill, high confidence in stakeholders and long-term value creation for organizations and these initiatives also help companies to strengthen their relationships with stakeholders and reduce operational risks. With strong reporting practices related to governance,

companies can create a good environment for decision-making, transparency, integrity and accountability. As per the data we find that ESG scores do not have significant impact on financial performance but outcomes of analysis of this study show the growing importance of ESG reporting in influencing financial performance and operational efficiency which also can reduce the fraud and greenwashing activities from organizations.

According to the increasing reporting of ESG practices, regulatory compliance and stakeholders' awareness has motivated to Indian companies to incorporate different type of activities related to environmental protection practices, social contribution and good governance with their regular business activities. Consequently, companies with high ESG scores certainly experience high levels of confidence in stakeholders, low financial cost, long term value creation, high reputation, and operational efficiency in the organization.

In this present study examined the relationship between ESG score and financial performance of top 100 companies of NSE as per market capitalization using ESG score, category, ROA and ROE as variables of ESG and financial indicators. As per the present study of ESG and their impact on financial performance we can say that ESG reporting practices are becoming increasingly significant in determining business success in today's rapidly changing business environment. Companies demonstrating high ESG scores generally exhibit better governance practices, improved stakeholders' relationship and enhanced risk management capabilities and these factors significantly contribute to sustainability and financial performance. The present research paper reinforces the high significance of integrating environmental, social and governance considerations into business strategy to achieve long-term value creation for organization. As per the outcomes we can say that ESG practices in no longer merely a compliance requirement but has emerged as a strategic business imperative capable of influencing both financial and operational efficiency.

Recommendations for Policy Implications: -

As per the present research we find that ESG score has significant impact on financial and operational performance and in the coming years with more regulatory compliance it will be more significant for companies. The findings show that the impact of ESG score on profitability in under the beyond the significance level which shows less impact on financial performance but to achieve sustainable economic growth organizations are required to adhere to guidelines of SDG-8 to ensure

that fraud less, greenwashing less financial information. The present research suggests the following suggestion to improve more financial transparency, sustainable economic growth, sustainable environmental practices, social practice and high level of governance practices.

- Companies should focus on strict regulatory compliance with ESG reporting to achieve the target of SDG-8 that will also improve transparency and stakeholders' confidence.
- Companies should incorporate ESG practices in their planning, performance evaluation system and long-term strategy for sustainable economic growth.
- As per the outcomes, companies should focus on standardized governance practices to control fraud and greenwashing practices to control manipulation in reporting, this can strengthen the confidence of stakeholders. The strengthened corporate governance system continuously ensures accountability and ethical business practices in organizations.
- Companies should increase the environmentally friendly practices with the help of different initiatives. Including carbon reduction, waste management, tree plantation and resource management.
- To facilitate the areas related to social aspects, companies should focus on more inclusive development, employee welfare, diversity management, training and skills development programmes and community development programmes to enhance higher productivity of employees and good brand value of company.
- In India, regulatory authorities also should encourage a systematic and standardized framework related to ESG practices to improve comparability across different types of industries.

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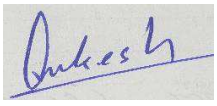
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Corresponding Author

Dr. Mukesh Kumar Kumawat

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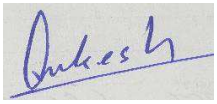


Corresponding Author

Dr. Mukesh Kumar Kumawat

Consent for Publication

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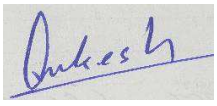


Corresponding Author

Dr. Mukesh Kumar Kumawat

Ethics Declaration

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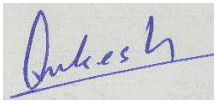


Corresponding Author

Dr. Mukesh Kumar Kumawat

Consent to Participate

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Corresponding Author

Dr. Mukesh Kumar Kumawat

Data Availability Statement

All data supporting the findings of this study are available within the paper and its Supplementary Information. The following are the links of sources of data:

Link: - https://www.nse-esgrating.com/esg-ratings

https://www.crisilesg.com/en/home/esg-ratings.html

Financial data (ROA & ROE) from Annual reports from official websites of selected companies under this research.



Corresponding Author

Dr. Mukesh Kumar Kumawat