

Statistical Modelling of ESG Investment and Sustainable Development in India's Sports Sector: A Bourdieusian Approach

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Abstract: This study examines how Environmental, Social, and Governance (ESG) investments influenced sustainable development in India's sports sector before 2021. It uses Bourdieu's capital theory and ESG frameworks employed to study the effects of these investments on economic, social, cultural, and symbolic capital in sports. The research relies on secondary data from firms' sustainability reports listed on the National Stock Exchange and on primary survey data. The sample consisted of 200 athletes, physical education teachers, and sports administrators, all selected through purposive sampling. A questionnaire was utilised to assess awareness of ESG (Environmental, Social, and Governance) issues, environmental sensitivity, the development of sustainable sports infrastructure, and levels of sports participation, using a five-point Likert scale. The instrument underwent expert review and was tested for validity. Data analysis was conducted using SPSS, with a focus on correlation and regression methods. The results indicate that ESG investments are a strong predictor of sustainable sports infrastructure development ($\beta = 0.59$, $p < 0.01$) and have a moderate impact on sports participation ($\beta = 0.36$, $p < 0.05$). Additionally, environmental awareness plays a significant role in elucidating the relationship between ESG investments and behaviour. The study highlights the crucial role of Environmental, Social, and Governance (ESG) principles in promoting sustainability within the sports sector. It emphasises the need to integrate these principles into India's sports governance and regulations.

Keywords: ESG Investment; Sustainable Sports Development; Environmental Awareness; Sports Infrastructure; Sports Participation; Bourdieu Theory; India

Introduction: ESG investing has significantly transformed global financial markets, prompting investors to consider sustainability and social responsibility alongside profit (Friede et al., 2015; Eccles et al., 2014). This paradigm shift has altered traditional capital allocation by incorporating environmental, social, and governance factors into financial decision-making (Bush & Friede, 2018). Within this global context, the adoption of ESG principles in India warrants examination. In 2011, the Indian government introduced the National Voluntary Guidelines on Social, Environmental, and Economic Responsibilities of Business (NVEGs), which encouraged responsible business practices and promoted sustainability reporting (Sharma et al., 2020). By 2019, the number of firms adopting ESG principles had increased from 20, driven by evolving regulations and heightened awareness among investors and regulators (Kumar et al., 2016).

The sports sector contributes to socio-economic growth by enhancing public health, fostering social inclusion, and strengthening national identity and economic expansion in emerging markets (Giulianotti, 2015; Grix & Carmichael, 2012). Its importance is reflected in the Sustainable Development Goals (SDGs), which highlight the role of sports in promoting environmental awareness and social equity (United Nations, 2018). However, the relationship between ESG investing and the sports sector remains underexplored, as much ESG research prioritises economic outcomes and often overlooks the social impact within sports (Fatemi et

al., 2018). This study addresses this gap by investigating how ESG investment influences sports infrastructure and participation in India, using data collected prior to 2021. By integrating Bourdieu's theory of capital with ESG and sustainability frameworks, this research provides practical insights into the ways financial capital shapes sports development.

Review of Literature: Over the past two decades, research on ESG investing, sustainability, and sports development has expanded considerably, reflecting increased scholarly and professional interest in the intersection of finance, environment, and society. Historically, ESG investing, formerly referred to as Socially Responsible Investing (SRI), focused on excluding firms with unethical practices. Investment strategies have since evolved to address a broader range of environmental, social, and governance issues (Sparkes, 2017; Friede et al., 2015). Alareeni and Hamdan (2020) demonstrate that ESG disclosures influence multiple dimensions of firm performance; while environmental and community initiatives may incur short-term costs, they often result in stronger long-term valuations, and robust governance enhances performance across several benchmarks.

Babiak and Trendafilova (2011) observe that sports organisations prioritise sustainability for reasons such as cost savings and brand enhancement, with stakeholder expectations and legal requirements frequently driving these decisions. This indicates that sustainability efforts are often aligned with organisational objectives rather than being motivated solely by ethical considerations. Sports organisations also promote environmental awareness within their communities, thereby extending the impact of their Corporate Social Responsibility (CSR) initiatives beyond their immediate operations. Understanding how Environmental, Social, and Governance (ESG) investments can drive social and behavioural change in the sports sector is essential. Research demonstrates that strong ESG performance is often associated with superior financial outcomes. Sustainable companies effectively manage risks, improve operational efficiency, and engage stakeholders in meaningful ways (Eccles et al., 2014; Busch & Friede, 2018).

However, the link between ESG performance and financial outcomes may vary across contexts. In emerging markets, where institutional frameworks are less robust, these dynamics can differ (Nollet et al., 2016; Fatemi et al., 2018). Despite the challenges and opportunities in the sports sector, ESG disclosure improves firm performance and increases commercial value. Issues such as standardisation and transparency still persist (Sharma et al., 2020; Kumar et al., 2016). These findings stress the importance of ESG in shaping corporate behaviour and investment, especially in emerging markets.

Additionally, sports promote sustainability by encouraging energy-efficient infrastructure, improving waste management, and reducing emissions (Giulianotti, 2015). They also foster social inclusion (United Nations, 2018). Both ESG practices and the sports sector contribute to sustainability and positive social outcomes. CSR initiatives within sports organisations enhance legitimacy (Walzel et al., 2018). Major sporting events support sustainability initiatives and enhance corporate value (Preuss, 2015). Bourdieu's "Theory of Capital" illustrates how economic and cultural capital influence society and transform into each other. Here, ESG investment is economic capital that public engagement and trust convert into social capital.

Research gap: Despite progress, significant gaps remain. Few studies have examined the connections between ESG investment and sports participation or facilities in India, and the social effects of ESG in sports are still underexplored. This underscores the need for interdisciplinary research. The present study addresses these gaps by investigating the relationship between ESG investment and sports development, which informs its objectives.

RESEARCH OBJECTIVES:

1. Investigate the relationship between ESG investment and the advancement of sustainable sports infrastructure.
2. Evaluate the impact of ESG investment on the levels of sports participation among communities and individuals.
3. Explore how environmental awareness influences the relationship between ESG investment and sports participation.
4. Interpret ESG investment through Bourdieu's theory by analysing the transformation and interplay among economic, social, cultural, and symbolic capital in sports.

RESEARCH METHODOLOGY:

This study employs both quantitative and qualitative data to examine the impact of ESG investments on long-term growth in Indian sports. Data collection and analysis were conducted concurrently, and integrating the results at the conclusion enhances the study's depth and robustness. The research utilises both secondary and primary data sources. Secondary data on ESG investments were obtained from public reports of Indian firms listed on the National Stock Exchange, including sustainability and financial records. Primary data were collected through a standardised questionnaire administered to 200 respondents, comprising athletes, physical education instructors, and sports administrators from Haryana, Punjab, and Chandigarh. This sample was selected for its direct involvement in sports activities and organisational processes, ensuring relevance to the study of ESG practices in the sports sector.

The questionnaire had four parts: demographic information, ESG awareness, views on environmental awareness and sustainable infrastructure, and sports participation behaviour. All questions used a five-point Likert scale from "strongly disagree" to "strongly agree." The questionnaire's content validity was assessed by a panel of three experts from sociology, sports management, and environmental studies, who reviewed all items for clarity, relevance, and correspondence with the research objectives. Based on their feedback, several questions were refined to improve readability and remove ambiguity. A pilot test was conducted with a group of 15 respondents similar to the target population, after which minor modifications were made to the wording and item sequence. Reliability of the final instrument was confirmed using internal consistency measures (Cronbach's alpha > 0.70), following Hair et al. (2014).

The collected data were analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics summarised the data, while correlation analysis examined relationships among variables, and multiple regression analysis assessed the impact of ESG investment and environmental awareness on infrastructure and participation outcomes. The level of significance was set at $p < 0.05$, with stronger significance at $p < 0.01$. Ethical standards were maintained throughout the study, with voluntary participation, informed consent, and confidentiality of responses ensured.

RESULTS AND DISCUSSION:

Table 1: Descriptive Statistics of Key Variables

Variable	Mean	Std. Deviation	Minimum	Maximum
ESG Investment Awareness	3.92	0.81	2.10	5.00
Environmental Awareness	4.08	0.74	2.30	5.00
Sports Participation	3.61	0.89	1.80	5.00
Sustainable Infrastructure Index	3.78	0.85	2.00	5.00

Table 1 presents descriptive statistics for key variables. Environmental awareness has the highest mean ($M = 4.08$), indicating considerable environmental consciousness among stakeholders. ESG investment awareness is also high ($M = 3.92$). Sports participation has a moderate mean ($M = 3.61$), showing moderate engagement. The gap between awareness and participation emphasises an “attitude–behavior gap” in sustainability (United Nations, 2018). Standard deviations reflect moderate variability and consistent responses. These statistics form a solid analytical foundation.

Table 2: Correlation Matrix

Variable	ESG Investment	Environmental Awareness	Sports Participation	Infrastructure
ESG Investment	1	0.62	0.45	0.68
Environmental Awareness	0.62	1	0.51	0.57
Sports Participation	0.45	0.51	1	0.49
Infrastructure	0.68	0.57	0.49	1

Note: $p < 0.01$

Table 2 shows strong positive correlations. ESG investment is closely linked to sustainable infrastructure ($r = 0.68, p < 0.01$), indicating that greater ESG investment is associated with

better infrastructure. Environmental awareness also has positive links with both infrastructure ($r = 0.57$) and participation ($r = 0.51$), showing its key role.

Environmental awareness mediates the relationship between ESG investment, sustainable infrastructure, and sports participation. To clarify the mediation analysis, the study followed the steps recommended by Baron and Kenny (1986). First, we established that ESG investment is significantly associated with sports participation. Second, we confirmed that ESG investment is also related to environmental awareness. Third, we analysed whether environmental awareness predicts sports participation when controlling for ESG investment. Finally, we assessed whether the direct relationship between ESG investment and sports participation reduces when environmental awareness is included in the model. To formally test the mediation, we applied the Sobel test (Huo et al., 2017). The Sobel test supported the significance of the mediation effect, confirming that environmental awareness serves as a key intermediary variable that channels the indirect effects of ESG investment on individual and community sports participation. This suggests that ESG influences participation both directly and, more importantly, indirectly by raising environmental awareness, which in turn drives behavioural changes. This pattern of mediation is consistent with previous research on the role of awareness in the implementation of sustainability initiatives, such as infrastructure development, before affecting individual behaviour.

Table 3: Model Summary (Infrastructure Model)

Model	R	R ²	Adjusted R ²	Std. Error of Estimate
1	0.73	0.53	0.51	0.62

Table 3 summarises the regression analysis predicting sustainable sports infrastructure. The R value (0.73) indicates a strong link between predictors (ESG investment, environmental awareness) and the outcome. The R² value (0.53) indicates that the model explains 53% of the variance in infrastructure, a substantial figure for the social sciences (Hair et al., 2014). The adjusted R² (0.51) indicates that the model explains a substantial amount of variance even after accounting for the predictors. ESG investment and environmental awareness remain strong factors for infrastructure, with a clear difference seen. ESG investment and environmental awareness together better predict sustainable infrastructure than models that exclude them. Low residual variance indicates that the model captures the main relationships well, supporting the reliability of the regression results.

Table 4: Coefficients (Infrastructure Model)

Variable	B	Std. Error	Beta (β)	t-value	Sig.
Constant	1.12	0.28	—	4.00	0.000
ESG Investment	0.59	0.07	0.59	7.89	0.000
Environmental Awareness	0.31	0.09	0.31	3.45	0.001

Table 4 shows that ESG investment is the strongest predictor of sustainable sports

infrastructure ($\beta = 0.59, p < 0.001$), indicating that financial capital has a strong effect on infrastructure development ($\beta = 0.31, p < 0.01$), amplifying investment impact.

According to Bourdieu’s theory, economic capital (ESG investment) can be converted into social and cultural capital, as seen in infrastructure and participation (Bourdieu, 1986).

Table 5: Regression Model (Sports Participation)

Model	R	R ²	Adjusted R ²	Std. Error
1	0.69	0.47	0.45	0.66

The model summary for sports participation shows that ESG investment and environmental awareness explain 47% of the variation in participation, indicating moderate explanatory power. The regression results indicated that when environmental awareness was included as a mediator, the direct effect of ESG investment on participation was reduced and became less significant. This result indicates that although financial investment helps participation, other social and cultural elements also affect behaviour.

Table 6: Coefficients (Sports Participation Model)

Variable	B	Std. Error	Beta (β)	t-value	Sig.
Constant	0.98	0.25	—	3.92	0.000
ESG Investment	0.36	0.08	0.36	4.12	0.001
Environmental Awareness	0.41	0.07	0.41	4.89	0.000

Table 7 demonstrates that ESG investment exerts a moderate but significant effect on sports participation ($\beta = 0.36, p < 0.01$). Environmental awareness has a slightly stronger effect ($\beta = 0.41, p < 0.001$), showing that behavioural and intellectual factors are important for turning infrastructure into real participation. This study finds that ESG investment plays a key role in the sustainable development of India’s sports sector. Data from before 2021 show that ESG investment greatly improves sustainable sports infrastructure and has a moderate effect on sports participation. From a sociological view, the study shows that ESG investment helps turn economic capital into social and cultural capital in sports. This change boosts institutional legitimacy, participation, and sustainability.

Despite these important findings, there are some limitations. The study uses only data from before 2021, so it may not reflect changes in ESG and sports behaviour after the pandemic. Also, because the study is cross-sectional, it mainly shows associations and not clear cause-and-effect relationships. The use of purposive sampling, although effective for reaching athletes, physical education teachers, and sports administrators directly involved in the sector, may introduce sample bias and limit the extent to which the results can be generalised (Dharampal & Ani, 2019). Since participants were chosen based on their expertise and involvement, the sample could not capture the full diversity of perspectives across the wider population, including recreational participants, grassroots organisations, or less-represented regions. This specific composition might overestimate ESG awareness or the effectiveness of eco-friendly practices compared to the general population. Therefore, caution should be taken

when extending these outcomes to other groups or geographical contexts, and subsequent studies should consider more representative sampling strategies intended to enhance external validity.

Future Research (Post-2021 Developments): Subsequent research should use data from after 2021, especially given that ESG regulations, digital changes in sports governance, and the focus on sustainability have increased since events like COVID-19. New policies, such as stronger disclosure rules and green financing, could change how ESG works in sports. Long-term studies and longitudinal data analysis could help us better understand changes over time and their causes. Comparing different regions or countries would also help us see how ESG adoption varies in the sports sector.

Contribution to Theory: This study makes important theoretical contributions through integrating ESG investing with the sociology of sport. First, this study builds on Bourdieu's theory of capital by showing how financial capital (ESG investment) can be converted into other forms of capital in the sports sector (Hu & Kang, 2017). The study provides real-world evidence for this change, which was largely theoretical before, and highlights its effects on development and social outcomes. While this research draws on Bourdieu's ideas, other sociological theories present useful perspectives as well. For instance, network theory analyses the influence of relationships and social connections on the diffusion and adoption of ESG investments within sports organisations, suggesting that networks may facilitate or limit the flow of resources and practices.

In contrast, institutional theory would interpret the findings by focusing on how formal rules, norms, and cultural expectations within the sports sector influence the uptake and impact of ESG investments. Where Bourdieu's theory emphasises the transformation and accumulation of different forms of capital, institutional theory highlights the role of organisational legitimacy and conformity to established standards in shaping outcomes. Critical theorists, meanwhile, might argue that ESG investments could, in some cases, maintain existing social stratifications rather than dismantle them, especially if such investments primarily benefit already privileged groups. By briefly comparing these perspectives, the study demonstrates theoretical rigour and promotes further critical engagement with how ESG investment and sports development interact across contexts. Third, it combines sustainability theory with sociological analysis, showing how awareness and behavioural change are key to achieving sustainable outcomes.

Contribution to Practice: The study presents practical advice for people in the sports sector. Sports organisations should use ESG principles to boost sustainability and legitimacy. Schools should include environmental awareness in physical education. Companies should align their ESG investments with sports development projects. The data show that combining infrastructure development with awareness programs can greatly boost sports participation. (Khelo India Scheme, 2016)

Policy Implications: The study furnishes multiple key policy implications:

1. **ESG-Based Sports Funding Framework:** Governments should integrate ESG criteria into sports funding policies, making sure that investments prioritise sustainability and social impact.
2. **Environmentally Friendly Infrastructure Development:** Public investment should focus on eco-friendly sports infrastructure, including green stadiums and power-saving facilities.
3. **Awareness and Behavioural Programs:** Policies should emphasise environmental education and awareness, attempting to bridge the gap between infrastructure and participation.

4. CSR Coordination with Sports: Corporate social responsibility (CSR) initiatives should align with sports development, particularly by promoting sustainability and inclusion.
5. Institutional Governance: Sports federations should adopt ESG reporting standards to boost clarity and accountability.

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