DOI: 10.47968/gapgyan.9S3

An Initiative towards Student Research

ANUSHODHAN

ESG (Environmental, Social, and Governance) Practices in Business

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ESG (Environmental, Social, and Governance) Practices in Business

Conveners:
Dr. Rupa Vishal Shah, Dr. Megha Khedekar

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Message by President, RSET and Chairman, Governing Council

Shri. Ashokji Saraf

It gives me immense pleasure to see the continuation of **Anushodhan 2026 – An Initiative towards Student Research**, reflecting our institution's commitment to fostering curiosity, creativity, and academic growth.

In today's rapidly changing world, research and innovation are essential parts of meaningful education. Anushodhan 2026 provides a valuable platform for students, faculty members, and researchers to present their ideas, share knowledge, and explore diverse areas of study.

Such initiatives encourage students to think independently, go beyond conventional learning, and develop a spirit of inquiry and collaboration. They also contribute to creating a vibrant academic and research environment within our institution.

I sincerely appreciate the efforts of the Editorial Team, faculty coordinators, researchers, and student participants whose dedication has contributed to this initiative. I hope Anushodhan 2026 continues to inspire young minds and strengthen our institution's journey towards research and academic excellence.

I extend my best wishes to GSCC and the entire Anushodhan team for continued success.

My best wishes for a successful and inspiring Anushodhan 2026.

Message by Principal

Dr. Preeti Oza

(Ghanshyamdas Saraf College of Arts & Commerce - Autonomous)

It gives me great pleasure to present **Anushodhan 2026 – An Initiative towards Student Research**, reflecting our institution's commitment to academic excellence, innovation, and the development of a research-oriented culture.

Research encourages students to think critically, explore new ideas, and connect their academic learning with real-world challenges. In keeping with the vision of NEP 2020, initiatives like Anushodhan provide students with opportunities to develop creativity, analytical thinking, and a spirit of inquiry.

Anushodhan 2026 offers a platform for students and faculty to share their research, exchange ideas, and explore diverse areas of knowledge. It is also an important step towards encouraging young learners to engage in meaningful research and knowledge creation.

I appreciate the efforts of the Editorial Team, faculty coordinators, and student contributors whose dedication has made this initiative possible. I hope Anushodhan continues to inspire curiosity, innovation, and research among our students.

My best wishes to the entire team for a successful and enriching Anushodhan 2026.

Message by Vice Principal

Dr. Seema Agarwal

(Ghanshyamdas Saraf College of Arts & Commerce - Autonomous)

It gives me great pleasure to see the continuation of **Anushodhan 2026 – An Initiative towards Student Research**, reflecting our institution's commitment to encouraging research, creativity, and academic growth.

In today's evolving academic environment, research plays an important role in developing knowledge and critical thinking. Anushodhan 2026 provides students, faculty members, and researchers with an opportunity to explore new ideas, share their work, and engage in meaningful academic discussions.

Initiatives like these encourage students to look beyond classroom learning, develop analytical skills, and participate actively in research and knowledge creation. They also promote collaboration and strengthen the overall academic environment of the institution.

I sincerely appreciate the efforts of the organizing committee, faculty coordinators, and student volunteers whose dedication has contributed to this initiative. I hope Anushodhan 2026 continues to inspire young researchers and further strengthen the culture of research within our institution.

I extend my best wishes to the entire Anushodhan team for a successful and enriching initiative.

Best wishes for Anushodhan 2026 and its continued success.

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ESG (Environmental, Social, and Governance) Practices in Business

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GEN-Z MANAGEMENT: BRIDGING COMMUNICATION GAPS ACROSS MULTI-GENERATIONAL WORKFORCES

Prof. Shreya Phanse
Mr. Krish Chaudhary
Ghanshyamdas Saraf College of Arts & Commerce

Abstract:
This research investigates the complexities inherent in managing generational diversity within contemporary workplaces, with a focus on identifying and mitigating sources of conflict while fostering intergenerational collaboration. By examining employees spanning The Silent Generation, Baby Boomers, Generation X, Millennials, and Generation Z, the study elucidates the influence of divergent values, expectations, and communication styles on workplace dynamics. The findings suggest that, although managing generational diversity presents considerable challenges, it concurrently offers substantial opportunities for innovation and organizational growth when approached effectively. The study underscores the critical importance of tailored conflict resolution strategies, inclusive communication practices, and targeted training programs designed to bridge generational gaps. This research provides valuable insights for entrepreneurs and business leaders, emphasizing the potential for enhanced productivity and employee satisfaction through improved intergenerational collaboration.

Keywords: *The Silent Generation, Baby Boomers, Generation X, Millennials, Generation Z.*

Introduction:

To Gen-Z Management: Bridging Communication Gaps Across Multi-Generational Workforces

- **The Silent Generation (1928–1945) –** Born between 1928 and 1945, this generation grew up during the Great Depression and World War II. They are generally associated with discipline, loyalty, and respect for authority.
- **Baby Boomers (1946–1964) –** Born between 1946 and 1964, they grew up during the post-war economic boom. They are often characterized by strong work ethics, career commitment, and organizational loyalty.
- **Generation X (1965–1980) –** Born between 1965 and 1980, Gen X experienced major social and technological changes. They are commonly viewed as independent, adaptable, and practical.
- **Millennials / Generation Y (1981–1996) –** Born between 1981 and 1996, Millennials grew up alongside the rise of the internet and digital technology. They tend to value flexibility, collaboration, meaningful work, and work-life balance.

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- **Generation Z (1997–2012) –** Born between 1997 and 2012, Gen Z is the first generation to grow up with smartphones, social media, and widespread digital connectivity. They are generally considered tech-savvy, adaptable, and comfortable with digital communication.

Generational Diversity in the Workplace – Today, organizations may have employees from several of these generations working together. Understanding their different communication styles, expectations, technological familiarity, and approaches to work can help managers reduce communication gaps and create a more inclusive workplace.

Understanding Gen Z Beyond Stereotypes. Gen Z is not "difficult," but distinctly different. They are:

- Highly tech-savvy and digitally fluent
- Purpose-driven and selective about opportunities
- Strongly inclined toward autonomy and boundaries
- Focused on rapid growth and early leadership exposure
- More loyal to personal development than organisational tenure

Unlike previous generations that prioritised stability and security, Gen Z professionals often seek fulfilment, flexibility, and meaning. The "safety net factor" — growing up with greater economic cushioning has influenced career risk appetite and expectations around work–life balance. At the same time, Gen Z employees are task-oriented and efficient, shaped significantly by the COVID-era shift to remote and KPI-driven performance. However, this results-focused mindset sometimes comes at the cost of deeper organisational alignment or long-term perspective.

As four generations increasingly share the workplace, companies face both opportunities and challenges arising from such rich age diversity. While tension may surface due to differing work styles or values, research shows that with intentional collaboration, the strengths of each generation can lead to greater innovation, creativity, and productivity. from Boomers to Generation Z, proven strategies for fostering intergenerational collaboration.

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Key differences emerged regarding preferred communication methods, work-life balance expectations, and attitudes toward hierarchy and technological disruption. Results also revealed a complex interplay between generational stereotypes and actual characteristics. For instance, while popular perception casts Baby Boomers as technophobic traditionalists and Gen Z/Millennials as impatient job-hoppers, reality shows a spectrum within each cohort. Such complexity underscores the need to avoid harmful overgeneralizations that alienate employees of any age. Still, patterns did surface; for example, 60% of employees under 35 preferred to digitally collaborate through informal messaging or virtual whiteboarding rather than email, while over 55% of Boomers and Gen Xers favoured formal meetings and written communication. By recognizing such tendencies without typecasting entire generations, leaders can tailor inclusive policies catering to diverse needs while dissolving divides. The researchers identified four organizational practices that promoted generational integration and boosted enterprise innovation capacity by 12-18%: flexible scheduling/remote work options; reverse mentoring partnering older employees with younger staff to exchange knowledge both ways; intergenerational teaming which improved outcomes on complex tasks by tapping the complementary strengths of different age groups; and social activities facilitating casual bonding across generations. Results advocate dismantling age bias through diversity training focused on unconscious generational stereotyping. This paper contributes timely and actionable insights on building a culture where cross-generational collaboration unlocks creativity, productivity and longevity enhancing purpose and fulfilment for a multigenerational workforce.

Objective of the Study:

The object of this research is the Using communication as a medium to bridge the gap between different generations and the role of GEN Z in it.

Methodology:

The present study is based on secondary and primary data. An extensive literature review of secondary data sources was undertaken as relevant to the stated objectives of the study.

This study has been conducted within a short time frame. Thus, the scope of the study is limited.

Review of Literature:

1) **Nakash, Maayan. "Redefining Workforce Dynamics: The Rise of Generation Z."** ***Critical Aspects in Advanced Human Resource Management*** **(2026): 187-218.**

   This article reviews research around generational differences and examine the causality between these differences and conflicts usually happening at the

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workplace. The conflicts can be defined as value-based, behaviour based, or identity-based.

2) **Burton, Cherise M., et al. "Critical elements for multigenerational teams: a systematic review." *Team Performance Management: An International Journal* 25.7-8 (2019): 369-401.**

The multiple generations present in the workforce today has led to an exponential increase in teams with a multigenerational composition. The individuals in these teams have varying values, goals, and characteristics as well as stereotypes that are perceived by other generations, which leads to many open questions.

3) **Kapoor, Camille, and Nicole Solomon. "Understanding and managing generational differences in the workplace." *Worldwide hospitality and tourism themes* 3.4 (2011): 308-318.**

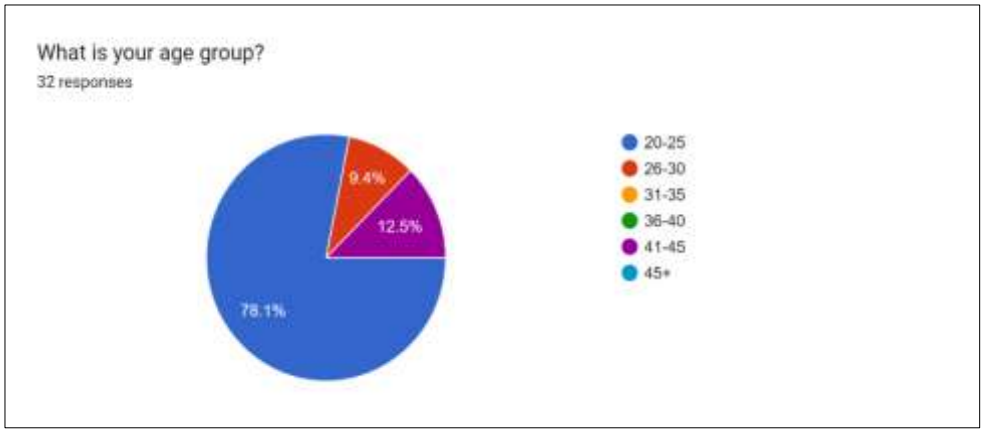
This research shows that employers must identify the separate characteristics of each generation present in their workplace.

4) **Kunaratnam, Praveena, Lilian Anthonysamy, and Mazni binti Alias. "Generational Perceptions of Leadership Styles and Their Effects on Employee Performance: A Systematic Review." *Malaysian Journal of Social Sciences and Humanities (MJSSH)* 11.6 (2026): e004043-e004043.**

The growing occurrence of multigenerational workforces has heightened the levels of academic and practical concern in the ways leadership styles are seen between generations and how these perceptions affect the performance of the employees.

Primary Data:

1. **What is your age group**



The age group in the chart shows most of the peoples are from 20-25 around 78.1%.

2. **Which generation do you belong to?**

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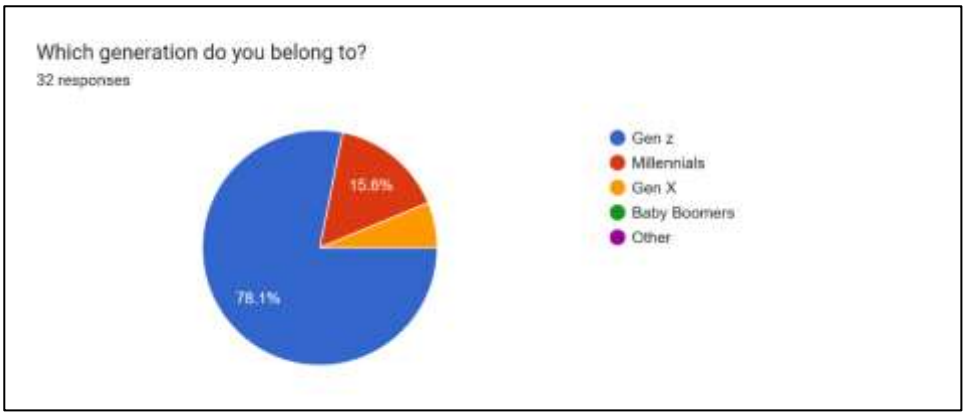
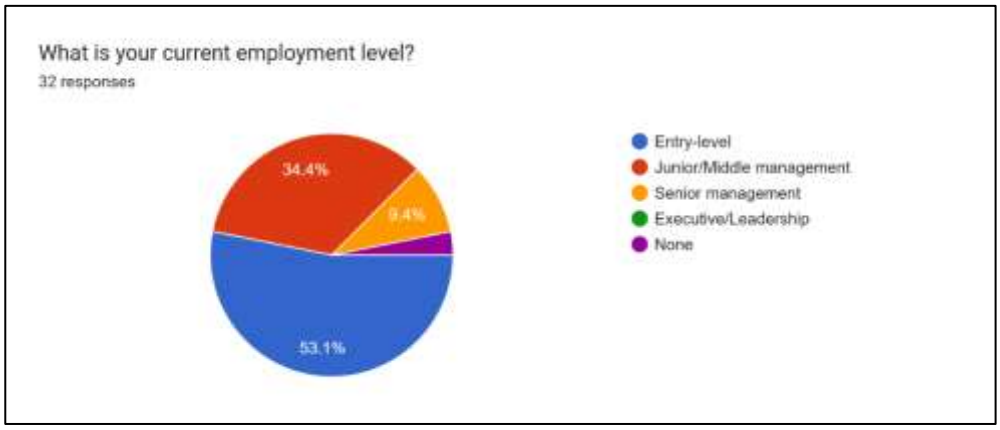


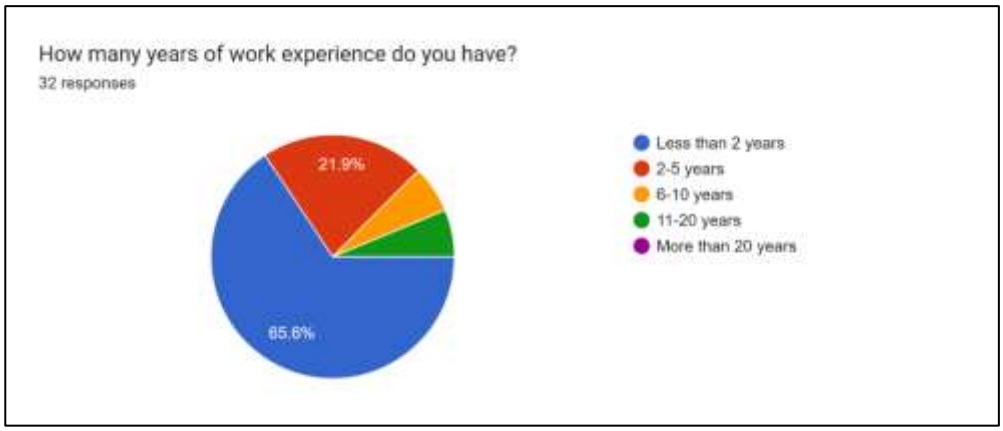
More number of Gen-Z people have answered the question.

3.What is your current employment level?



More number of Entry-level employees as compare to Senior Management employees.

4.How many years of work experience do you have?



It was observed that Entry-level Staff were more keen to answer.

5.How many generations are represented in your immediate team?

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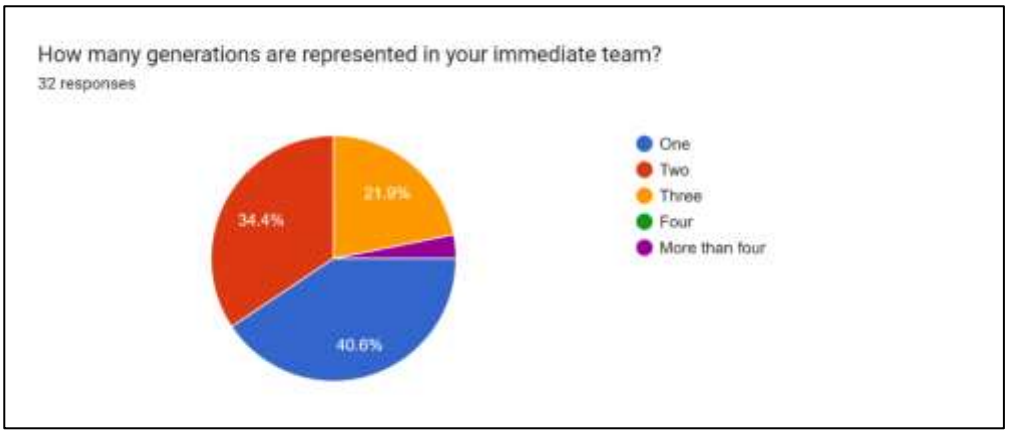
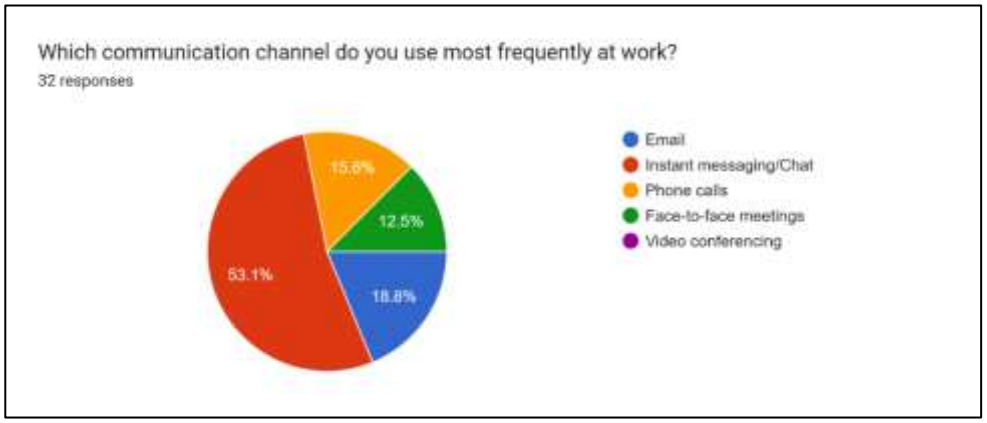
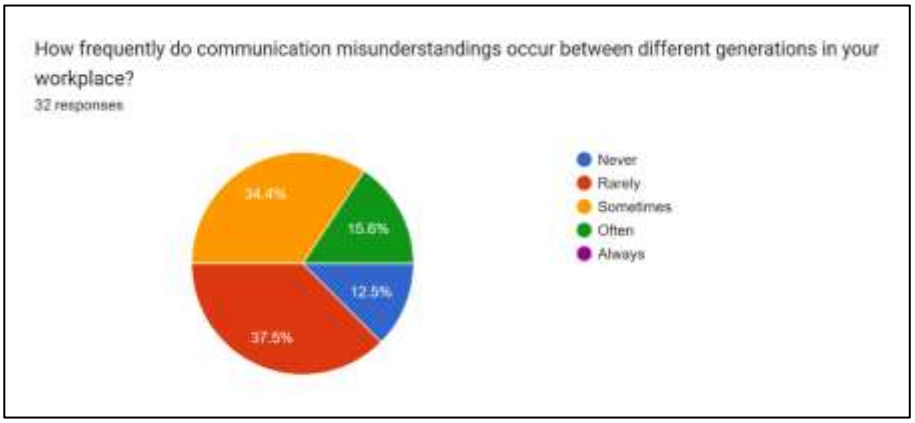


6.Which communication channel do you use most frequently at work?



Instant messaging chat is used to most frequently at work.

7. How frequently do communication misunderstandings occur between different generations in your workplace?



Rarely communication misunderstandings occur between different generations in your workplace.

8.What is the biggest cause of communication gaps between generations?

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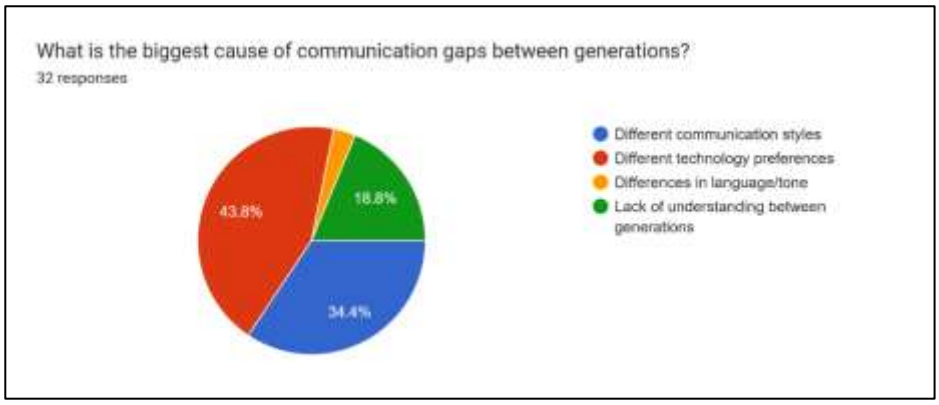
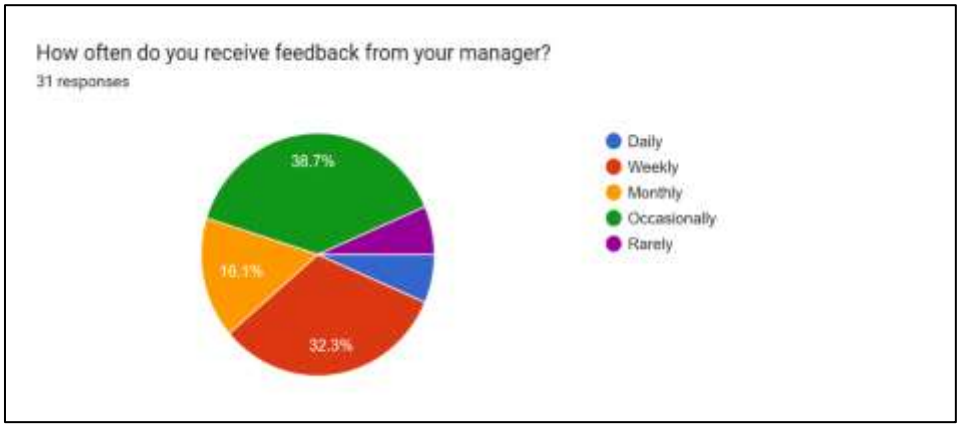


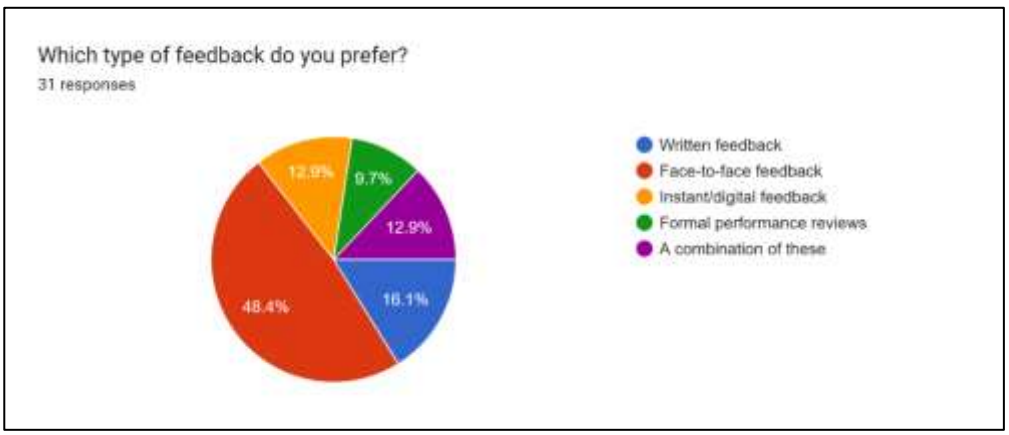
Different Technology Preferences are the biggest cause of communication gap between generations.

9.How often do you receive feedback from your manager?



We receive Occasional feedback from manager.

10.Which type of feedback do you prefer?



We prefer face-to-face feedback.

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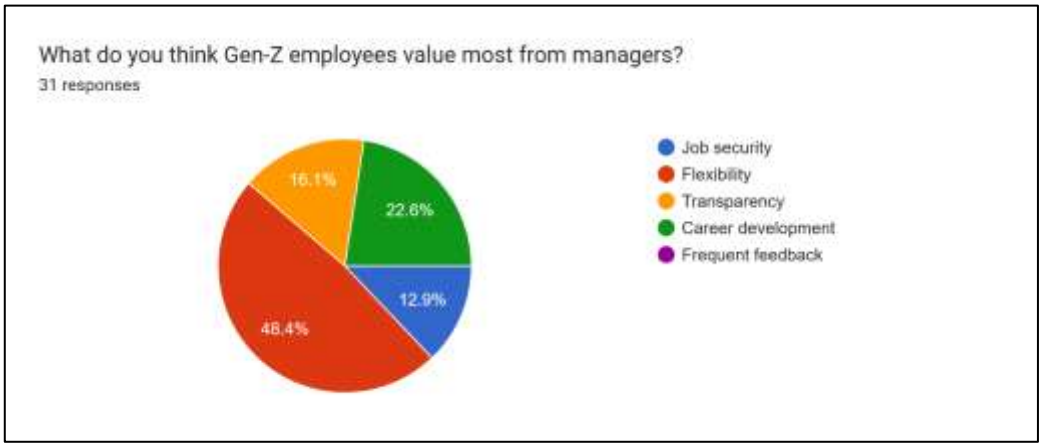
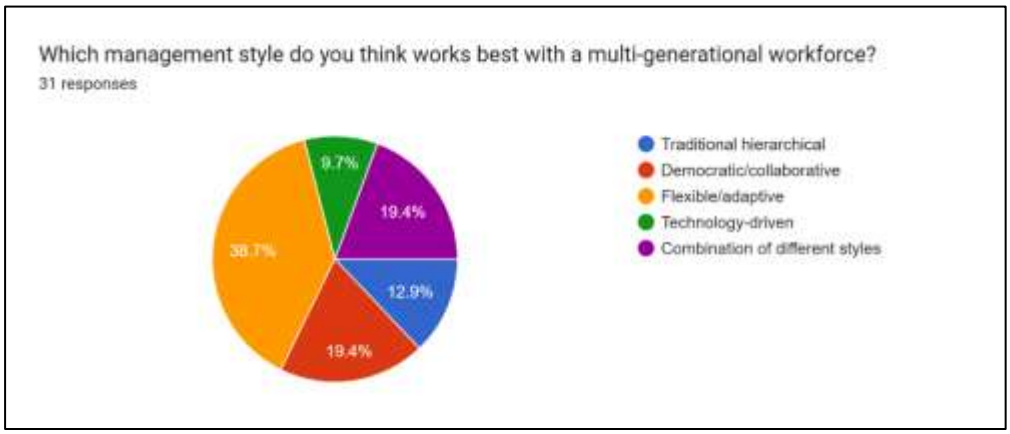
11. What do you think Gen-Z employees value most from managers?



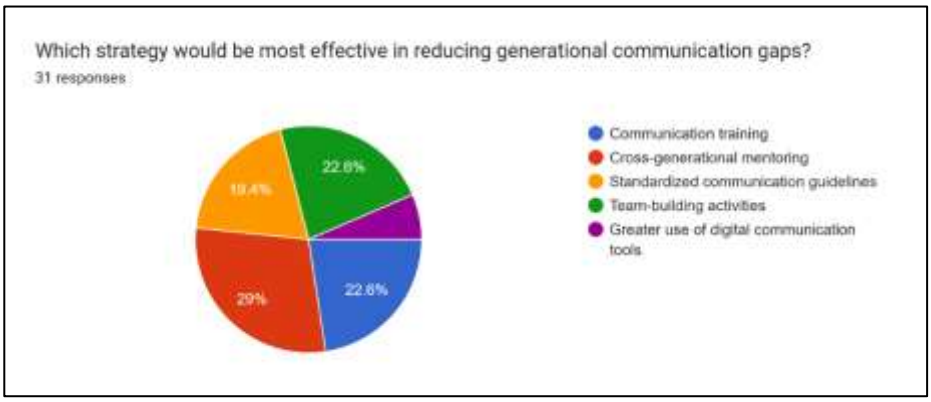
Flexibility from the managers towards employees.

12. Which management style do you think works best with a multi-generational workforce?



Flexible works best with a multi-generational workforce.

13. Which strategy would be most effective in reducing generational communication gaps?



Cross-generational mentoring strategy would be most effective in reducing generational communication gap.

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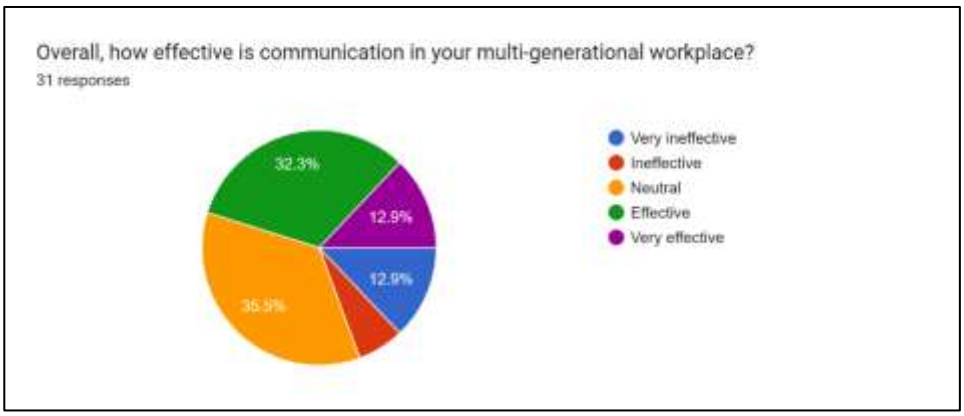
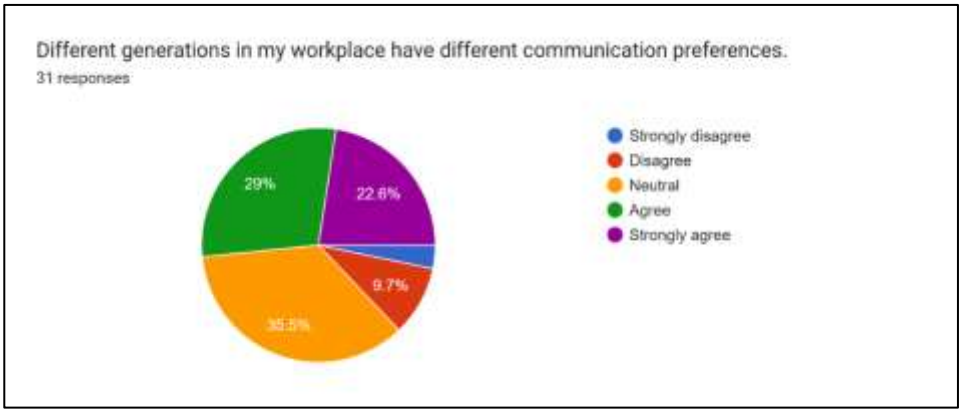
14. Overall, how effective is communication in your multi-generational workplace?



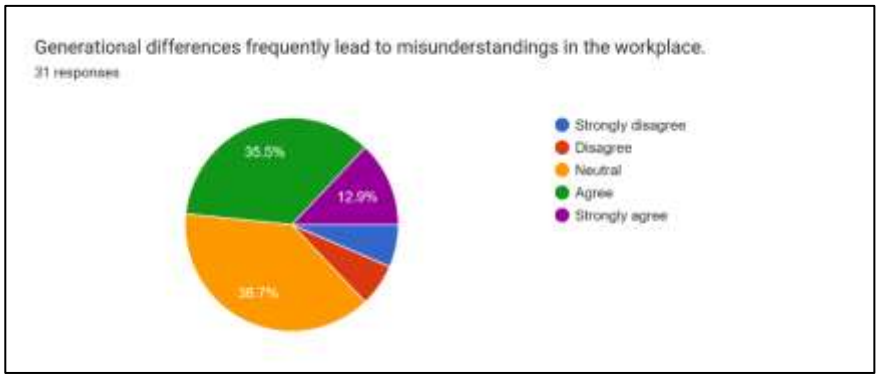
Neutral is communication in your multi-generational workplace.

15. Different generations in my workplace have different communication preferences.



People have neutral opinions on this question.

16. Generational differences frequently lead to misunderstandings in the workplace.



Many people agree that Generational differences frequently lead to misunderstandings in the workplace.

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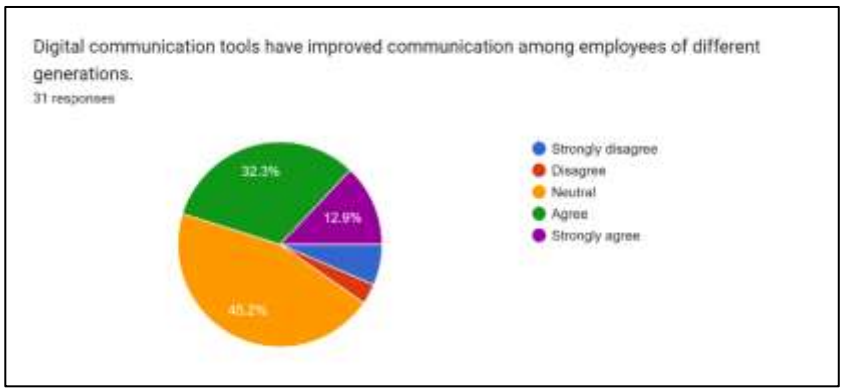
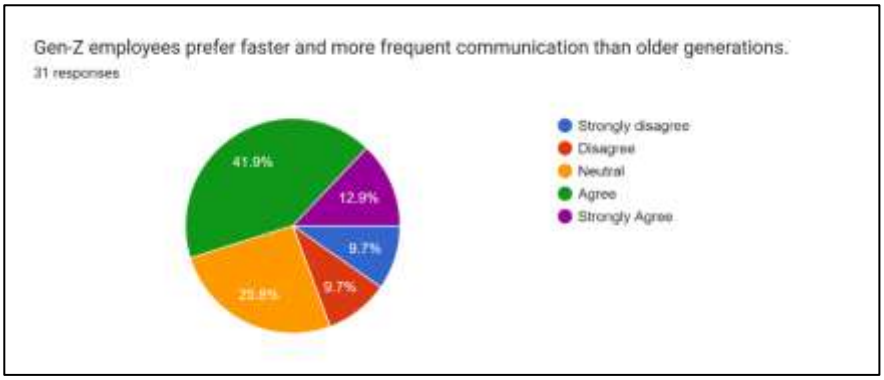
17.Digital communication tools have improved communication among employees of different generations.



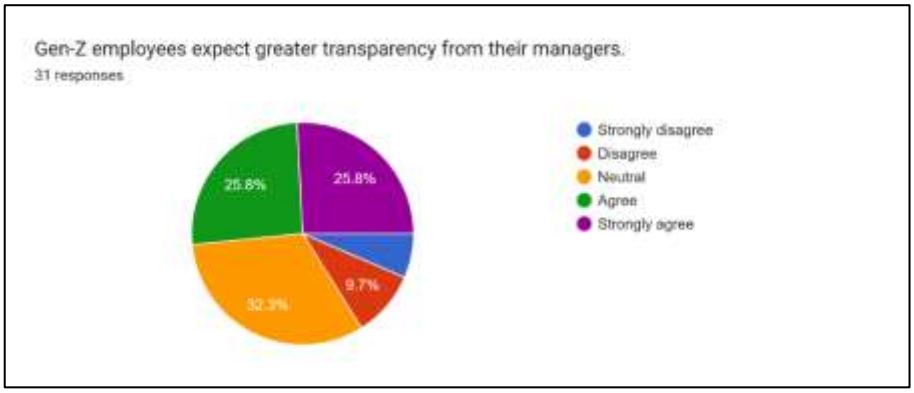
Many people digital communication tools have improved communication among employees of different generations.

18.Gen-Z employees prefer faster and more frequent communication than older generations.



Many people Gen-Z employees prefer faster and more frequent communication than older generations.

19.Gen-Z employees expect greater transparency from their managers.



Many people Gen-Z employees expect greater transparency from their managers.

20.Managers need to adapt their communication style when managing employees from different generations.

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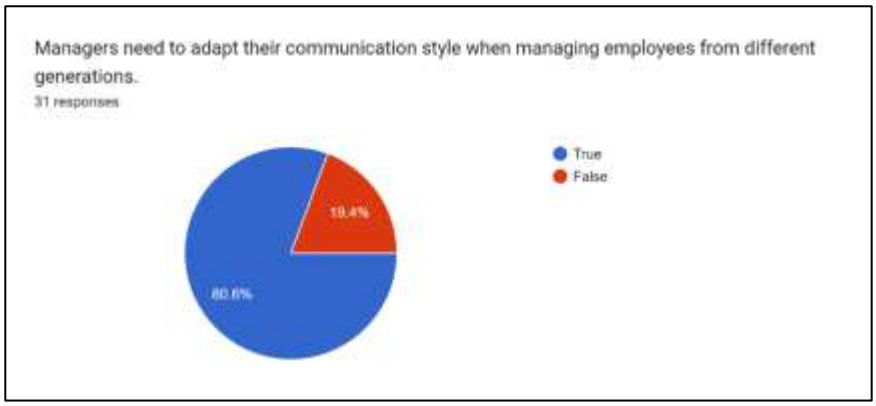
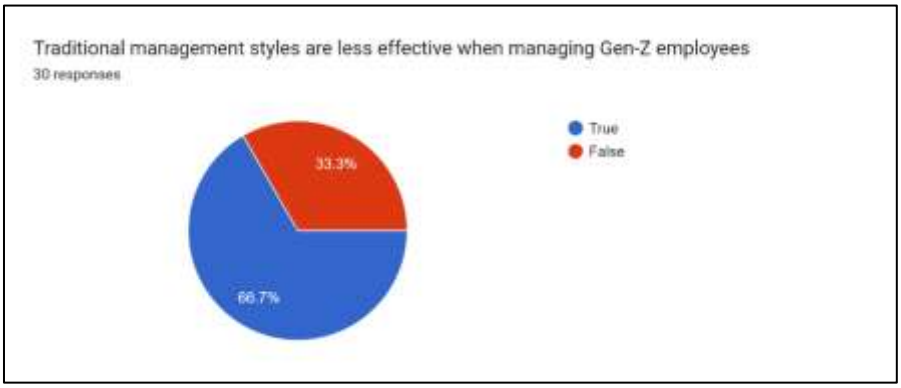


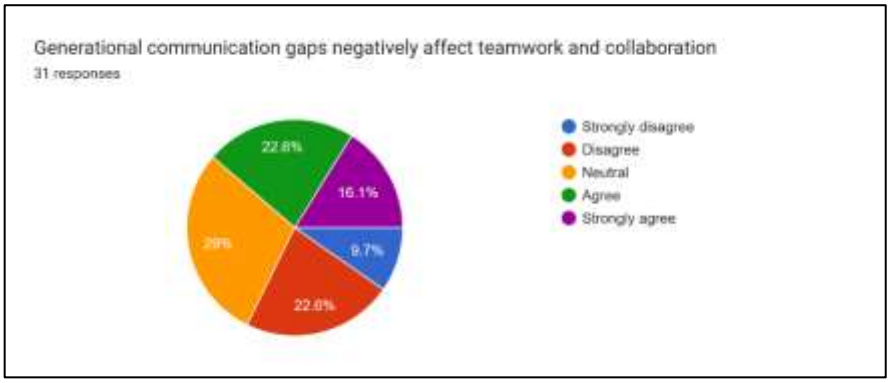
Employees feels its true that Manager need to adapt their communication style when managing employees from different generations.

21. Traditional management styles are less effective when managing Gen-Z employees



Most of the people think it's true that Traditional management styles are less effective when managing Gen-Z employees.

22.Generational communication gaps negatively affect teamwork and collaboration.



Many of the people agree that Generational communication gaps negatively affect teamwork and collaboration.

23.Cross-generational mentoring and communication training can significantly improve workplace.

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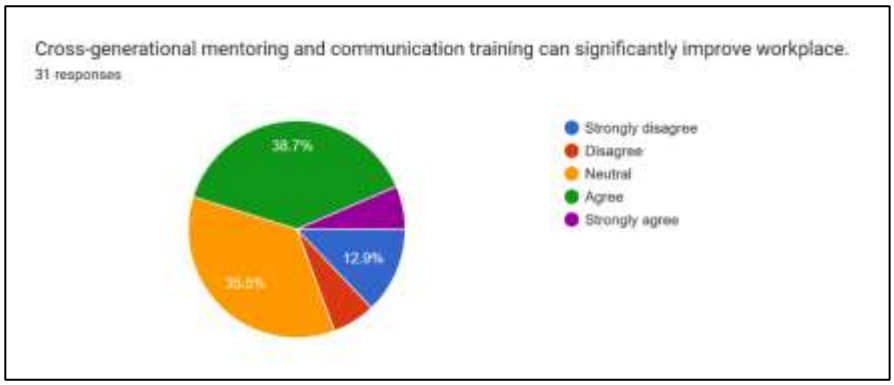
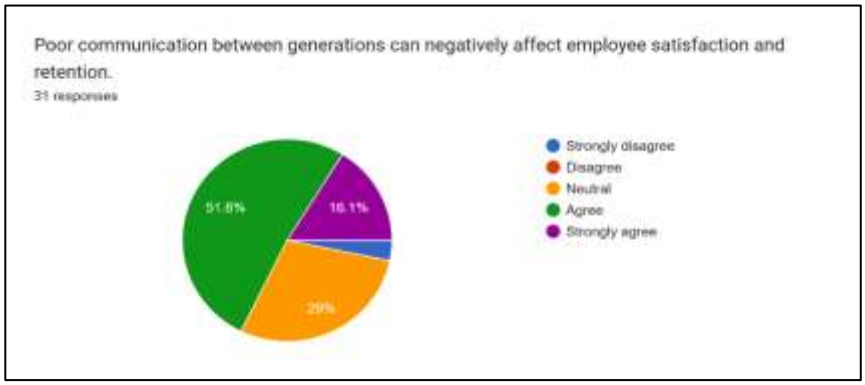


Many of the people agree that Cross-generational mentoring and communication training can significantly improve workplace.

24. Poor communication between generations can negatively affect employee satisfaction and retention.



Many of the people agree that Poor communication between generations can negatively affect employee satisfaction and retention.

Conclusion and Suggestions:

Suggestions:

1. Create a flexible communication framework: Organizations should allow employees to use email, instant messaging, video meetings, and face-to-face discussions according to the urgency, complexity, and sensitivity of the issue rather than age-based preferences.
2. Introduce reverse and two-way mentoring: Senior employees can share industry knowledge, leadership skills, and professional experience, while Gen Z employees can contribute knowledge of digital tools, emerging technologies, and contemporary communication trends. Such reciprocal mentoring can reduce stereotypes and strengthen relationships.

Traditional mentorship typically involves older employees advising younger ones, but flip mentoring flips the script, allowing Gen Z and millennial workers to guide older colleagues about social media trends, digital tools, and emerging technologies. PR firms and corporations, younger employees offer insights into platforms like TikTok and train older generations on modern lingo and marketing strategies. Conversely, seasoned professionals share soft skills like networking and in-person communication

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that younger employees may lack due to growing up in a digital era. This mutual exchange creates opportunities for growth and understanding across age groups. In businesses across industries—from hospitality to healthcare—senior staff gain tech know-how while junior staff refine professional and interpersonal skills.

Conclusion:

The rise of Generation Z in the workplace is transforming how organizations communicate, collaborate, and manage talent. In today's multi-generational workforce, Baby Boomers, Generation X, Millennials, and Generation Z bring different experiences, expectations, communication habits, and approaches to work. These differences can sometimes create misunderstandings, but they can also become a significant source of innovation and organizational strength. Research indicates that older employees often prefer more formal and direct communication such as meetings and phone calls, whereas younger employees are generally more comfortable with instant messaging and shorter, technology-enabled communication.

Organizations must also recognize that Gen-Z management is not simply about managing a particular age group. It represents a broader shift toward human-centered, flexible, transparent, and purpose-driven management. Many of the expectations associated with Gen-Z—such as continuous feedback, psychological safety, flexibility, inclusion, and meaningful career development—are increasingly relevant across generations. Managers who respond to these changing expectations can build workplaces that are more adaptable and engaged overall.

Limitations of the Study:

1. **Limited Sample Size** – The study covers a limited number of respondents. Therefore, the findings may not represent the entire workforce.
2. **Generational Differences** – Employees within the same generation may have different preferences. This makes it difficult to generalize communication patterns.
3. **Response Bias** – The study depends on respondents' personal views and experiences.
   Their opinions may influence the accuracy of the findings.
4. **Industry Differences** – Workplace communication varies across different industries and organizations. Hence, the findings may not apply equally to all sectors.
5. **Changing Trends** – Gen-Z workplace expectations continue to evolve with technology and social trends. Therefore, some findings may change over time.
6. **Limited Generalization** – The study may focus on a specific group, location, or organization.

Scope for future research:

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1) Time constrains resulted into less elaborate study
2) Many other methods of research can be used
3) Further we can study on comparison between Gen-Z workplace expectations across different college and cultures.
4) Future research can track how Gen-Z expectations change over time.

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UNDERSTANDING RESPONSIBLE INVESTMENT DECISIONS: THE ROLE OF BEHAVIOURAL BIASES AND ESG AWARENESS AMONG YOUNG INVESTORS

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Avadhut Dinesh Sadvilkar
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Abstract:
Responsible investing considers not only financial returns but also environmental, social, and governance (ESG) factors. This study examines how ESG awareness and behavioural biases influence responsible investment decisions among young investors aged 18–35 years. Data were collected from 100 young investors using a structured questionnaire and a five-point Likert scale. The findings show moderate ESG awareness and a positive attitude towards responsible investing, but a gap between ESG awareness and actual investment decisions. Confirmation bias was the most noticeable behavioural bias. The study highlights the need for better ESG education, financial literacy, and awareness of behavioural biases to encourage more informed and sustainable investment decisions.
Keywords: *Responsible Investing, ESG Awareness, Behavioural Finance, Behavioural Biases, Young Investors, Sustainable Investing*

Introduction:

Investment decisions have evolved beyond the traditional objective of maximizing financial returns. Today, investors are increasingly considering the broader impact of their investments on society, the environment, and corporate governance. This growing awareness has contributed to the rise of responsible investing, an approach that incorporates Environmental, Social, and Governance (ESG) factors into investment decision-making. ESG factors enable investors to assess how effectively an organization manages environmental risks, fulfills its social responsibilities, and maintains strong governance practices. ESG has become an important consideration in investment decision-making, as it helps investors identify companies that are likely to create long-term value while contributing to sustainable development. By balancing financial performance with sustainability and ethical considerations, responsible investing aims to create long-term value for both investors and society. Responsible Investing involves taking sustainability and governance related factors into consideration in order to protect and enhance long-term value for clients.

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Young investors, particularly Millennials and Generation Z, are becoming an influential segment of the investment community. Growing financial literacy, widespread access to digital investment platforms, and the availability of real-time market information have encouraged greater participation in financial markets. Unlike previous generations, many young investors seek investments that not only generate returns but also reflect their personal values and commitment to sustainable development. However, despite their increasing interest in ESG-related investments their decisions may still be shaped by psychological and behavioural factors.

Behavioural finance suggests that investors do not always make rational decisions. Instead, their choices are often shaped by cognitive and emotional biases such as overconfidence, herding behaviour, loss aversion, anchoring, and confirmation bias. These behavioural biases can affect how investors perceive risk, process information, and select investment opportunities. As a result, even investors who value sustainability may deviate from responsible investment practices due to irrational decision-making.

At the same time, ESG awareness plays a crucial role in encouraging responsible investment behaviour. Investors who understand the environmental, social, and governance performance of companies are more likely to consider long-term sustainability alongside financial returns. Higher levels of ESG awareness can enhance investor's ability to make informed decisions, identify sustainable investment opportunities, and contribute to corporate accountability and responsible business practices.

Although responsible investing has gained considerable attention globally, there is limited empirical evidence on how behavioural biases and ESG awareness jointly influence the responsible investment decisions of young investors, particularly in the Indian context. Understanding this relationship is important for financial institutions, policymakers, educators, and investment professionals seeking to promote sustainable investment practices among the younger generation.

The present study, "Understanding Responsible Investment Decisions: The Role of Behavioural Biases and ESG Awareness among Young Investors," aims to examine the extent to which behavioural biases and ESG awareness influence responsible investment decisions. The study seeks to provide insights into the investment behaviour of young investors and offer recommendations that can support the adoption of more informed, responsible, and sustainable investment practices.

Research Methodology:

1. Research Design

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This study adopts a quantitative research design using a descriptive and analytical approach to examine the influence of behavioural biases and ESG awareness on responsible investment decisions among young investors. Primary data will be collected through a structured questionnaire, while secondary data will be obtained from journals, books, and research reports.

2. Target Population and Sample

The target population comprises young investors aged 18–35 years. A convenience sampling technique will be used to select respondents, with a sample size of 100 young investors.

3. Data Collection Methods

- **Survey:** A structured questionnaire using a five-point Likert scale will be distributed online to collect data on ESG awareness, behavioural biases, and responsible investment decisions.
- **Secondary Data:** Relevant information will be collected from research articles, journals, books, SEBI reports, and other reliable sources.

Review of Literature:

Banerjee and David (2024) examined ESG awareness among Indian investors and found that although awareness of ESG factors is increasing, investment decisions are still largely driven by financial returns. The study emphasized the need for better investor education and improved ESG disclosures to promote responsible investing.

Rani et al. (2024) studied socially responsible investing among Indian retail investors and reported that investors had a positive attitude towards ESG investing. However, limited awareness and insufficient knowledge were identified as key barriers to adopting responsible investment practices.

Makwana (2024) investigated behavioural biases influencing investment decisions and found that overconfidence, herding, anchoring, and loss aversion significantly affect investors' decision-making. The study concluded that psychological biases often lead investors away from rational investment choices.

Deka et al. (2023) analysed the relationship between ESG consciousness and behavioural biases among Indian investors. The findings indicated that greater ESG awareness encourages responsible investment behaviour and helps reduce the negative impact of behavioural biases on investment decisions.

Kraussl, Oladiran, and Stefanova (2024) reviewed recent studies on ESG investing and concluded that investors are increasingly incorporating ESG factors into their investment decisions. However, the authors highlighted the need for more research on the combined influence of ESG awareness and behavioural factors on investment behaviour.

Objectives of the study:

1. To determine the level of ESG awareness among young investors.

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2. To identify the behavioural biases that influence investment decisions.
3. To analyse the influence of ESG awareness on responsible investment decisions.
4. To examine the effect of behavioural biases on responsible investment decisions.
5. To compare the relative influence of behavioural biases and ESG awareness on responsible investment behaviour.
6. To recommend strategies for encouraging responsible and sustainable investment practices among young investors.

Hypothesis:

Hypothesis 1: ESG Awareness and Responsible Investment Decisions

- **(H0):** ESG awareness has no significant influence on responsible investment decisions among young investors.
- **(H1):** ESG awareness has a significant influence on responsible investment decisions among young investors.

Hypothesis 2: Behavioural Biases and Responsible Investment Decisions

- **(H0):** Behavioural biases have no significant influence on responsible investment decisions among young investors.
- **(H1):** Behavioural biases have a significant influence on responsible investment decisions among young investors.

Hypothesis 3: Combined Influence of ESG Awareness and Behavioural Biases

- **(H0):** ESG awareness and behavioural biases do not significantly influence responsible investment decisions among young investors.
- **(H1):** ESG awareness and behavioural biases significantly influence responsible investment decisions among young investors.

Data Analysis and Interpretation:

Age: Most respondents (50%) are aged 18–22 years, showing that the study mainly represents younger investors.

Gender: Female respondents form the majority (60%), while 25% are male and 15% preferred not to disclose their gender.

Occupation: Students constitute the largest group (47%), followed by salaried employees (24%).

Investment Experience: 43% of respondents have less than one year of investment experience, indicating that many participants are relatively new to investing.

ESG Awareness: The responses show a moderate level of ESG awareness. Although many respondents recognize the importance of sustainability, ESG information does not strongly influence all their investment decisions.

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Behavioural Biases: Behavioural biases are present among respondents, with confirmation bias being the most noticeable. This suggests that some investors tend to prefer information that supports their existing views.

Responsible Investment Decisions: Respondents show a generally positive attitude towards responsible investing. However, there is a gap between supporting sustainable investing and actually considering ESG factors while making investment decisions.

Hypothesis	Observation from Responses	Result
H01: ESG awareness has no significant influence on responsible investment decisions among young investors.	Respondents show awareness of ESG and a positive attitude towards sustainable investing, but ESG information has a limited influence on actual investment choices.	H0 Partially Rejected
H02: Behavioural biases have no significant influence on responsible investment decisions among young investors.	A considerable number of respondents report behavioural tendencies, particularly confirmation bias, which may affect their investment choices.	H0 Rejected
H03: ESG awareness and behavioural biases do not jointly influence responsible investment decisions among young investors.	The responses indicate that both ESG awareness and behavioural tendencies are relevant to how young investors approach responsible investing.	H0 Rejected

Findings of the Study:

1. The majority of respondents are young investors aged 18–22 years (50%).
2. 47% of respondents are students, indicating strong representation from the younger academic population.
3. 43% have less than one year of investment experience, showing that many respondents are relatively new to investing.
4. ESG awareness among respondents is moderate, with many remaining neutral about their familiarity with ESG investing.
5. Although respondents recognize the importance of ESG and sustainability, ESG information does not strongly influence actual investment decisions.
6. Confirmation bias is the most noticeable behavioural bias, with 50% of respondents agreeing or strongly agreeing with the related statement.
7. Responsible investment behaviour is generally positive, with 48% recognizing the long-term financial and social benefits of responsible investing.

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8. There is a noticeable gap between awareness and action, as respondents show interest in responsible investing but fewer actively consider ESG factors while selecting investments.
9. The findings suggest that improving ESG education and increasing awareness of behavioural biases could encourage more responsible investment practices among young investors.

Strategies for Promoting Responsible and Sustainable Investment Practices Among Young Investors:

- **Enhance ESG Awareness:** Conduct workshops, seminars, and awareness programmes to educate young investors about ESG investing and sustainable finance.
- **Improve Financial Literacy:** Encourage financial education initiatives that help young investors understand investment risks, behavioural biases, and the benefits of long-term investing.
- **Increase Access to ESG Information:** Companies and investment platforms should provide simple, transparent, and reliable ESG information to support informed investment decisions.
- **Reduce Behavioural Biases:** Educate investors about common behavioural biases and encourage rational, research-based investment decisions instead of emotional investing.
- **Leverage Digital Platforms:** Use social media, investment apps, webinars, and online campaigns to promote responsible investing among young investors.
- **Strengthen Regulatory Support:** Continue promoting ESG disclosure standards and investor awareness initiatives through regulators such as SEBI.
- **Promote Sustainable Investment Products:** Financial institutions should offer more ESG-focused investment options, such as sustainable mutual funds and green bonds, to encourage responsible investing.

Conclusion:

The study shows that young investors have a generally positive attitude towards responsible and sustainable investing. However, their overall ESG awareness is moderate, and many respondents do not regularly use ESG information when making investment decisions. Behavioural factors also play an important role, with confirmation bias being the most noticeable among the biases studied. Overall, the findings highlight a clear gap between awareness and actual investment behaviour. This suggests that greater ESG awareness, financial literacy, and understanding of behavioural biases can help young investors make more informed, responsible, and sustainable investment decisions.

Suggestions:

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1. **Increase ESG awareness:** Conduct workshops and awareness programmes on ESG and responsible investing.
2. **Improve financial literacy:** Educate young investors about risk, long-term investing, and sustainable investment options.
3. **Create bias awareness:** Help investors understand and control behavioural biases such as confirmation bias and overconfidence.
4. **Provide simple ESG information:** Investment platforms should make ESG information clear and easy to understand.
5. **Promote long-term investing:** Encourage young investors to focus on long-term sustainable returns rather than short-term market trends.

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A STUDY ON ESG FRAMEWORK AND GLOBAL STANDARDS (ESG: A PARADIGM SHIFT)

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Abstract:
This study examines the growing importance of Environmental, Social, and Governance (ESG) disclosures in business and finance. It reviews global reporting standards—GRI, SASB, TCFD, and IIRC—and analyses their convergence under the International Sustainability Standards Board (ISSB) through IFRS S1 and IFRS S2. The paper evaluates how companies use these standards to build stakeholder trust and align sustainability metrics with financial performance.
Using descriptive and analytical methods, the study draws secondary data from academic journals, ESG reports, SEBI guidelines, and IFRS/ISSB publications. Primary data was collected through a structured questionnaire and hypothesis testing from 77 individual investors to assess ESG awareness. The study also analyses CRISIL ESG Scores of India's Top 10 companies (FY 2025–26), highlighting how top ESG performers serve as benchmarks and demonstrate ESG as a strategic opportunity, encouraging voluntary adoption by other firms.
The study recommends standardized reporting, strategic integration, and stronger stakeholder collaboration to advance sustainable practices—linking corporate ESG reporting to India's national goals under Viksit Bharat 2047, Panchamrit 2030, and net-zero emissions by 2070.
Keywords: *ESG disclosures, sustainability reporting standards, ISSB, IFRS S1 and S2, CRISIL ESG scores, stakeholder trust, investor awareness, net-zero emissions, Viksit Bharat 2047*

Introduction:

1. Understanding ESG

Environmental, Social and Governance (ESG) refers to three broad categories of non-financial factors used to assess the sustainability and ethical impact of an organisation's operations, alongside its traditional financial performance:

- Environmental – how a company treats nature (energy use, waste, emissions).
- Social – how it treats people (workers, customers, communities).
- Governance – how it is managed (fair rules, transparency, absence of corruption).

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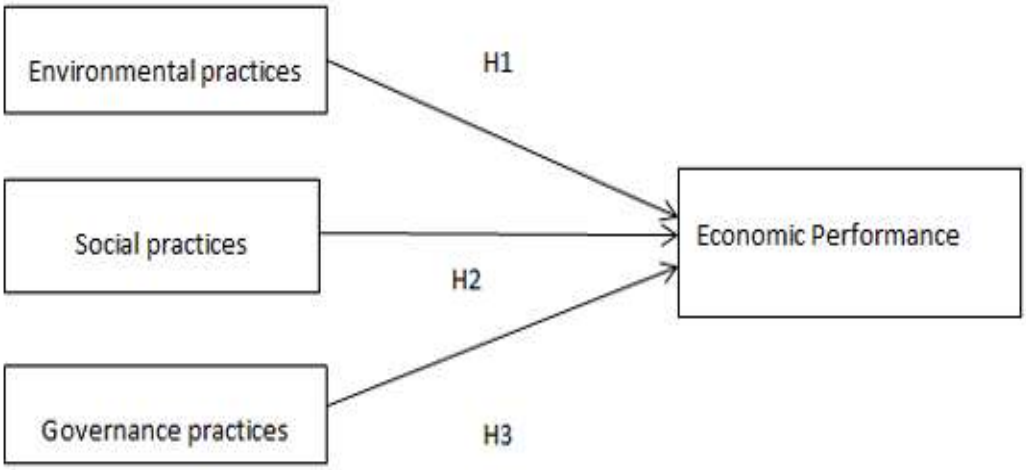

The Conceptual ESG Framework

The overall objective of the diagram is to evaluate how adopting sustainability initiatives influences financial success by measuring the distinct impacts of Environmental, Social, and Governance (ESG) practices on a firm's Economic Performance. ESG provides a common vocabulary and measurable indicators for this assessment. While concepts such as corporate social responsibility existed earlier, the term "ESG" was popularised by the United Nations Global Compact's 2004 report, Who Cares Wins. What is new, is the shift of ESG from a voluntary, reputational exercise to a core input into financial analysis, credit ratings, investment decisions, and statutory reporting — a shift that justifies systematic study from an investor's perspective, and one increasingly described as a paradigm shift in corporate reporting.

Several forces drive the adoption of ESG practices: changing customer preferences toward sustainable products; growing investor scrutiny of environmental impact, employee welfare and governance; tightening government regulation; and the reputational value of responsible conduct. In India, SEBI's Business Responsibility and Sustainability Report (BRSR) framework makes ESG disclosure mandatory for the top 1,000 listed companies by market capitalisation, with third-party assurance required — placing India among the few emerging economies where ESG disclosure is both mandatory and externally verified.

2. ESG Global Reporting Standards

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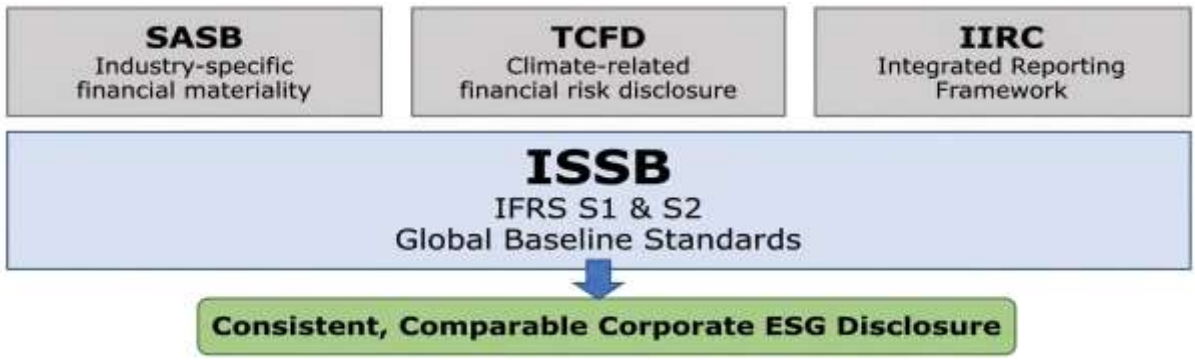
Standard / Framework	Focus
GRI (Global Reporting Initiative)	Broad stakeholder-focused sustainability reporting (impact materiality)
SASB (Sustainability Accounting Standards Board)	Industry-specific, financially material ESG metrics
TCFD (Task Force on Climate-related Financial Disclosures)	Climate-related risk and opportunity disclosure
IIRC — Integrated Reporting <IR> Framework	Links financial and non-financial capital in a single report

The Convergence of ESG Global Standards — A Paradigm Shift

For years, companies faced a confusing "alphabet soup" of overlapping ESG frameworks (GRI, SASB, TCFD, IIRC and others), each built by a different body for a different audience, making cross-company comparison difficult. To address this, the IFRS Foundation created the International Sustainability Standards Board (ISSB) in November 2021 at COP26, consolidating the Value Reporting Foundation (which housed SASB and the IIRC) and building on TCFD to create a single global baseline for sustainability disclosure alongside IFRS Accounting Standards — widely regarded as the defining paradigm shift in ESG reporting. Its two baseline standards are IFRS S1 (general disclosure of material sustainability risks and opportunities) and IFRS S2 (climate-related disclosures, including Scope 1, 2 and 3 GHG emissions).



Even after convergence, three rule-sets remain relevant: the ISSB standards, serving investors' financial-materiality needs; GRI, serving the impact-materiality needs of communities and stakeholders; and local regulation such as the EU's CSRD or India's BRSR, mandating region-specific metrics.

Adoption still faces real obstacles — limited understanding of ESG concepts, high investment costs, resistance to organisational change, gaps between standards,

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greenwashing risk, and short-term shareholder pressure. Addressing these is essential to embedding sustainable practice across business sectors.

Statement of Problem:

Decision-makers often view ESG initiatives as a short-term financial sacrifice, overlooking their strategic value — delaying investment, raising compliance risk, and eroding long-term competitiveness. This research examines how companies can overcome this bias and integrate ESG metrics into their financial and operational frameworks, using case studies of leading Indian companies with strong sustainability practices.

Importance of the Study:

- **Investor Awareness:** Gauges how aware individuals are of ESG's impact in business.
- **Perception Analysis:** Measures trust and belief that ESG improves long-term performance.
- **Bridging Research Gaps:** Adds value, as limited Indian research exists on this topic.
- **Industry Relevance:** Studies sustainability practices of leading Indian successful companies to motivate and voluntarily adopt ESG practices.

Review of Literature:

1. Chopra et al. (2024) argue current ESG frameworks are too company-centric, missing firms' broader societal impact — a "double-materiality gap" — and flag the risk of greenwashing.
2. Senadheera et al. (2021) find the Environmental pillar weakest in measurement consistency, as agencies' differing metrics make cross-sector comparison unreliable and disadvantage carbon-heavy industries.
3. Friede et al. (2015), reviewing over 2,000 empirical studies, find about 90 percent show a non-negative ESG–financial performance relationship.

Objectives of the Study:

- To assess awareness of ESG practices among individuals.
- To evaluate investor perception of ESG's effect on long-term performance.
- To analyze the association between demographic variables and ESG awareness.
- To study leading Indian companies with strong sustainability practices.

Research Methodology:

Research Design:

Descriptive and exploratory.

Data Sources

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(ISSN – 2581-5830)
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Primary Data: Structured questionnaire circulated via Google Forms (sample size: 77); convenience sampling.

Secondary Data: Academic journals, ESG reports of companies, SEBI guidelines, IFRS/ISSB publications, books, and online research articles.

Hypotheses:

No.	Null Hypothesis (H0)
H01	No significant relationship between educational qualification and awareness of ESG practices in business.
H02	No significant relationship between occupation and the belief that ESG improves a company's long-term business performance.

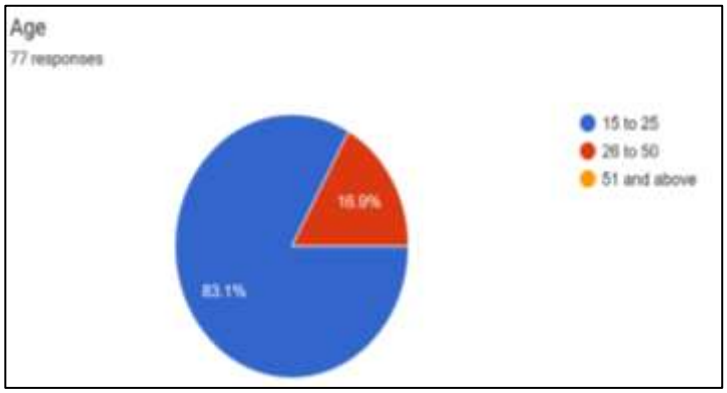
Limitations

Time and word constraints.

Respondent bias.

Data Analysis and Interpretation:

Key Survey Observations:



Majority respondents (83.1%) belonged to the 15–25 age group, who are typically early-stage investors.

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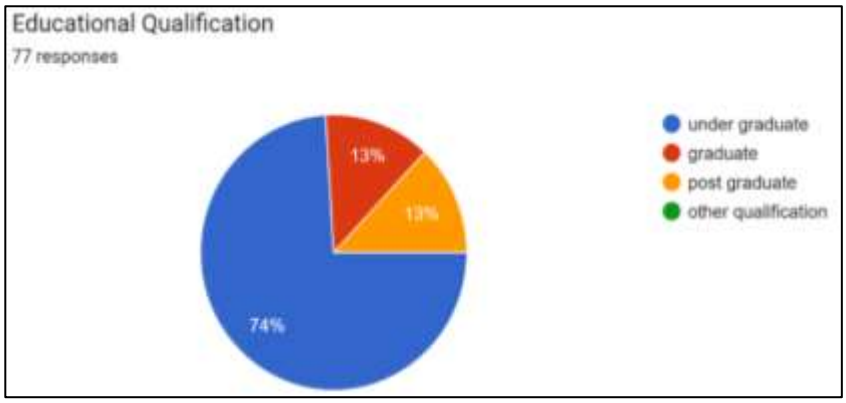
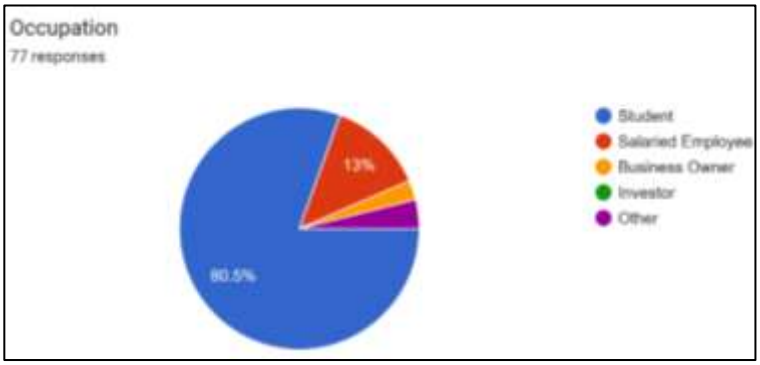
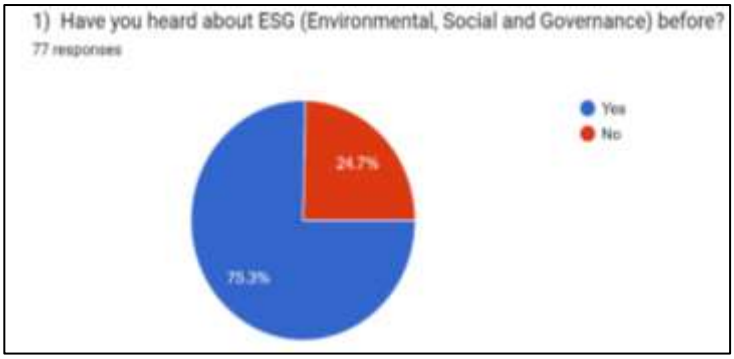


Most respondents (74%) were undergraduate



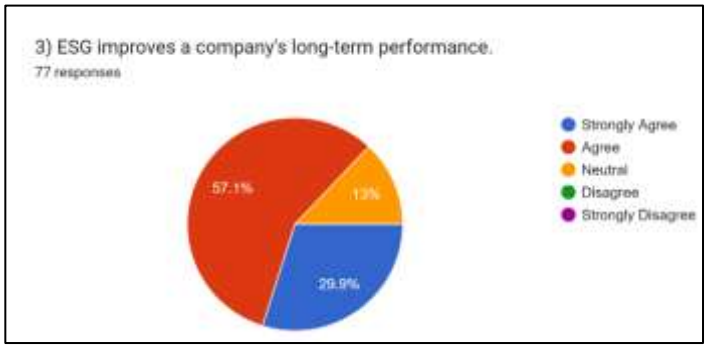
Most respondents (80.5%) were students

ESG Awareness:



75.3% respondents are aware about ESG

Opinions on ESG:



57.1% Agree and 29.9% strongly Agree that ESG improves company's long term performance.

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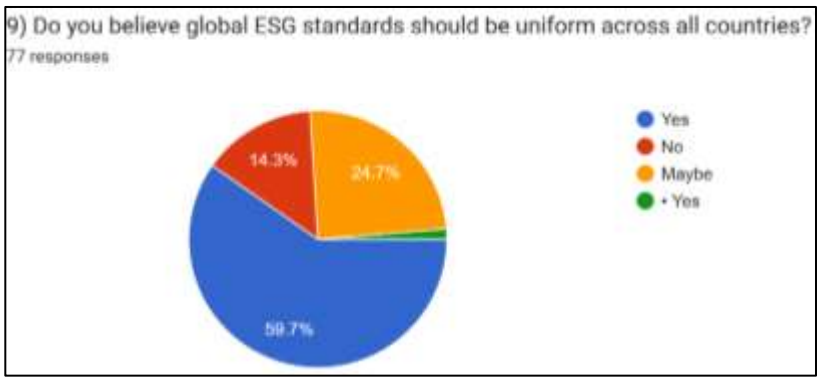
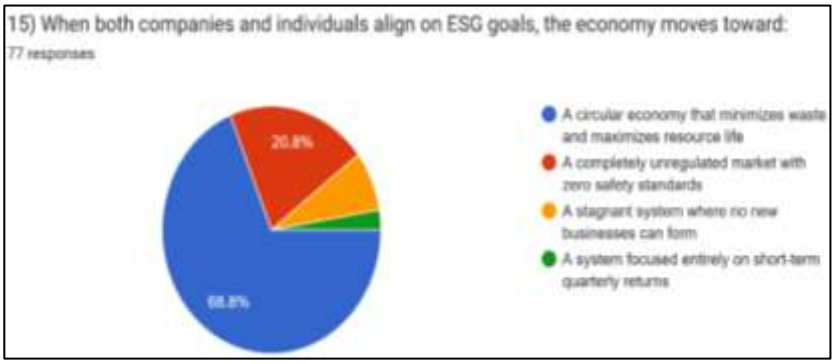
ESG Framework and Global Standards:



59.7% believe ESG standards should be uniform across all countries

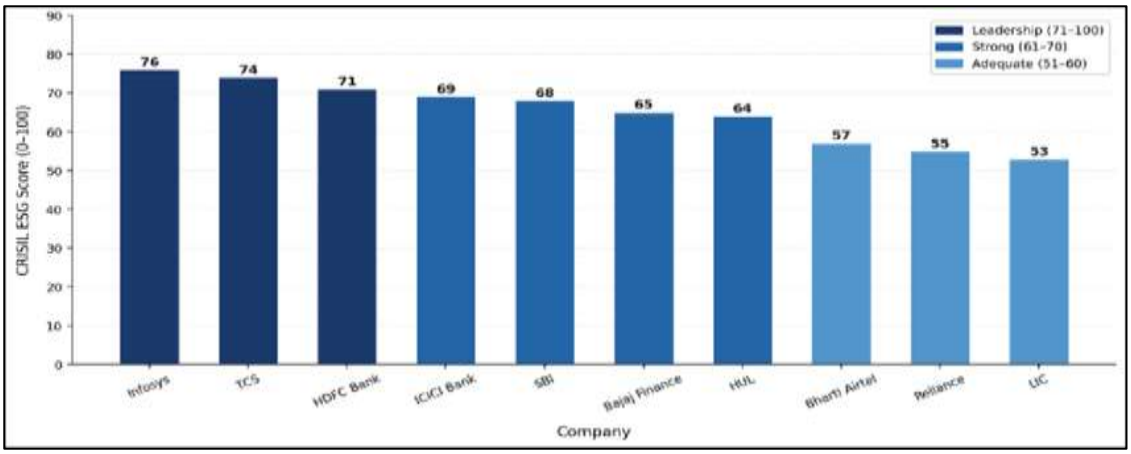
Economic Impacts:



68.8% cited that economy moves towards a circular economy that minimizes waste and maximizes resources life.

Case Studies of Leading Indian Successful Companies with Strong Sustainability Practices:

Company-wise CRISIL ESG Scores — Top 10 Indian Companies (FY 2025–26)



CRISIL ESG Scores — Leadership (71+), Strong (61–70), Adequate (51–60)

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Analysis and Interpretation:

IT firms lead ESG performance, with Infosys (76) and TCS (74) topping the list, reflecting low environmental footprint and strong governance.

Banking is mixed: HDFC Bank (71) reaches "Leadership," while ICICI Bank (69) and SBI (68) stay "Strong."

Asset-heavy firms like Reliance (55) and Bharti Airtel (57) fall into "Adequate," reflecting higher environmental intensity.

Service-based businesses clearly outperform capital-intensive ones.

Selected Companies ESG Practices to motivate and encourage voluntary adoption by other companies-

- **Infosys:** carbon-neutral (ISO 14068-1) operations; TRUE Zero Waste at 46% of campuses; 430+ million litres of rainwater storage; 84% of office area green-certified; 45% women in the workforce.

  Infosys is known as carbon neutral 7 years in a row, Global top employer 2026 and World's most ethical company
- **Tata Power:** targeting carbon net-zero before 2045 via clean energy, solar manufacturing and EV infrastructure; 3.4 lakh+ people trained via TPSDI; governed by the Tata Code of Conduct with mandatory vendor ISO/SA 8000 certification.
- **HUL:** targets recyclable packaging and water-neutral operations.
- **HDFC Bank:** is expanding green financing.
- **Tata Steel:** tracks carbon intensity toward India's 2070 net-zero target.

Above companies ESG practices clearly state that ESG is an investment and not cost to company. Decision-makers need to change their mindset. ESG investment gives indirect immediate benefit and assures long term growth and success. Sustainability can be integrated into core business operations for successful implementation. Let us study this example:

A company installs solar panels on its factory roof-Benefits

ESG Dimension	Key Outcome
Environmental Dimension	Reduced carbon emissions
Economic Dimension	Lower electricity costs
Social Dimension	Positive community image

This example demonstrates how one initiative can create multiple benefits.

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Hypothesis Testing (Chi-Square Test)

Hypothesis	Variables	X^2 (Calc.)	df	Table Value (5%)	p-value	Result
H01	Education × ESG Awareness	4.622	2	5.991	0.099	H0 Accepted
H02	Occupation × Long-term Performance Belief	4.900	6	12.592	0.557	H0 Accepted

Interpretation:

Across both hypotheses, the null hypothesis (H0) was accepted, indicating that educational qualification and occupation do not show a statistically significant relationship with respondents' awareness or perception of ESG practices and long term performance in business.

Findings:

ESG reporting benefits companies through cheaper capital access, earlier risk detection, and stronger brand trust; it benefits investors through clearer risk profiles, standardised comparability, and greater resilience to market shocks.

- Youth aged 15–25 are the most engaged demographic.
- Investors trust government/SEBI verification over company claims, and are ready to invest once rules and education improve.
- Awareness of ESG is widespread but shallow — most respondents have heard of ESG without understanding how it works.
- Lack of awareness and high implementation cost remain the principal concerns for companies.

These findings sit within India's Viksit Bharat 2047 vision and its Panchamrit climate commitments at COP26.

Research Gaps:

- limited Indian academic work exists on ESG framework and standards adoption by companies.
- Lack of long-term studies comparing short term profit and ESG long term investment conflict.
- Ethical implications largely unexplored.

Suggestions:

- Conduct workshops and campaigns to build ESG literacy, especially among young and semi-urban/rural investors.

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- Expand official government/SEBI certification of ESG-linked investments to reduce greenwashing fears.
- Use digital tools and AI to verify green projects and track investment impact.
- Introduce incentives (tax breaks, subsidies) for strong ESG performers alongside mandatory disclosure.

Conclusion:

Protecting the environment is a collective responsibility shared by governments, businesses, and civil society, with multinational organisations playing a critical role in advancing sustainable development across their value chains.

The ESG paradigm marks a significant shift in corporate reporting: companies are no longer judged on profitability alone but also on environmental impact, social responsibility, and governance quality. Effective disclosure improves transparency, reduces risk, and strengthens investor confidence. Despite challenges such as implementation costs, government support and global standards are accelerating adoption, making sustainability integration essential for long-term competitiveness.

Ultimately, ESG practices drive economic sustainability by guiding companies toward clean energy, fair labour treatment, and honest governance — while encouraging individuals toward greener choices that support a circular economy.

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ESG REPORTING IN INDIA: REGULATORY FRAMEWORK, CORPORATE PRACTICES AND AWARENESS AMONG UNDERGRADUATE STUDENTS

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Niti Goyal
Ghanshyamdas Saraf College of Arts & Commerce

Abstract:
Environmental, Social and Governance (ESG) reporting has become an important component of corporate governance, transparency and sustainable business practices in India. This study examines ESG reporting in India with a focus on the regulatory framework, particularly the Business Responsibility and Sustainability Reporting (BRSR) framework, corporate ESG practices, challenges, and awareness among undergraduate students. The study adopts a mixed-method approach using secondary data from regulatory bodies, corporate reports, research studies and international reporting frameworks, along with primary data collected through a structured questionnaire from 120 undergraduate students in Mumbai. The study finds that students demonstrate moderate awareness of ESG reporting and recognise its importance and career relevance, while awareness of the BRSR framework remains comparatively limited. The major challenges identified include lack of awareness, data collection difficulties, lack of standardisation, high compliance costs and greenwashing. A Chi-Square Test of Independence reveals a significant association between students' awareness of ESG reporting and their awareness of BRSR ($\chi^2 = 6.389$, $df = 1$, $p = 0.0115$), leading to the rejection of the null hypothesis. The study concludes that strengthening ESG education, practical training, corporate transparency and collaboration among regulators, companies and educational institutions can improve ESG awareness and reporting practices in India.

Introduction:

ESG (Environmental, Social and Governance) has become an important measure of business performance beyond financial profitability. ESG reporting helps companies disclose their environmental, social and governance practices, improving transparency, accountability, investor confidence and sustainable development.

In India, ESG-related practices evolved through CSR guidelines (2009), National Voluntary Guidelines (2011) and Business Responsibility Reports (BRR) introduced by SEBI in 2012. BRR was later replaced by BRSR, which became mandatory from FY 2022–23 for the top 1,000 listed companies by market capitalisation.

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Despite this progress, challenges such as lack of standardisation, high compliance costs, limited awareness and greenwashing remain. There is also limited awareness among undergraduate students about ESG regulations, BRSR and its growing career importance.

Students demonstrate a moderate level of awareness and generally positive perceptions towards ESG reporting, but awareness of the specific regulatory framework, particularly BRSR, remains limited.

Statement of Problem:

There is considerable literature on ESG reporting, regulatory developments and corporate disclosures in India; however, there is comparatively less focus on the awareness and perception of future business professionals regarding ESG reporting and the BRSR framework.

Objectives of Research Paper:

1. To study the regulatory framework governing ESG reporting in India, particularly the BRSR framework.
2. To examine ESG reporting practices adopted by selected Indian companies.
3. To identify the major challenges associated with ESG reporting in India.
4. To assess the awareness and perception of ESG reporting and BRSR among undergraduate students.
5. To suggest measures for strengthening ESG reporting practices and ESG awareness among future business professionals.

Scope of the Study:

The scope of this study is limited to examining ESG reporting practices and the regulatory framework in India. The study focuses on:

- Understanding the concept and importance of Environmental, Social, and Governance (ESG) reporting.
- Studying the ESG reporting framework introduced by SEBI, particularly the Business Responsibility and Sustainability Report (BRSR).
- Analysing the best ESG reporting practices adopted by leading Indian companies.
- Identifying the major challenges faced by organisations in implementing ESG reporting.
- Comparing India's ESG reporting framework with selected international reporting standards such as GRI, ISSB, and TCFD.
- Assessing the awareness and perception of undergraduate students in Mumbai regarding ESG reporting through a primary survey.
- Suggesting recommendations to improve ESG reporting practices and strengthen ESG education in institutions.

Significance of this Study:

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This study is significant as ESG reporting has become an essential component of corporate governance, sustainability, and responsible business practices. The research contributes to understanding the current status of ESG reporting in India and highlights the impact of recent regulatory reforms introduced by SEBI.

The study is beneficial to:

- **Students:** It enhances awareness and understanding of ESG concepts, regulatory requirements, and career opportunities in sustainability.
- **Educational Institutions:** It provides insights into the need for incorporating ESG-related subjects into commerce and curricula.
- **Companies:** It identifies key implementation challenges and offers practical recommendations for improving ESG reporting quality and transparency.
- **Regulators and Policymakers:** It supports ongoing efforts to strengthen ESG disclosure standards and promote responsible business conduct.
- **Researchers:** It serves as a useful reference for future studies on ESG reporting, corporate sustainability, and stakeholder awareness in India.

Overall, the study helps bridge the gap between ESG regulations and stakeholder awareness while promoting sustainable business practices and responsible corporate governance in India.

Literature Review:

Several studies have highlighted the growing importance of ESG reporting in improving corporate transparency, sustainability and investor confidence.

1. **Securities and Exchange Board of India (SEBI) – Business Responsibility and Sustainability Report (BRSR) Framework (2021; Mandatory from FY 2022–23)**
   SEBI introduced the BRSR framework in **2021**, and it became mandatory for the top 1,000 listed companies from **FY 2022–23**.
2. **Ministry of Corporate Affairs (MCA) – National Guidelines on Responsible Business Conduct (NGRBC) (2019)**
   The MCA released the National Guidelines on Responsible Business Conduct in **2019**.
3. **Indian Institute of Management (IIM) Ahmedabad (2023)**
   The study found that ESG disclosures by Indian companies improved after the implementation of BRSR while highlighting reporting inconsistencies and data quality challenges.
4. **Indian Institute of Management (IIM) Bangalore (2023)**
   Research observed increasing adoption of ESG reporting among Indian companies but identified challenges in ESG data collection and strategy integration.

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5. **PwC India (2024)**
   PwC reported that leading Indian companies have increased climate-related and greenhouse gas emissions disclosures, though reporting practices differ across sectors.
6. **KPMG India (2023)**
   KPMG highlighted that evolving regulations and disclosure requirements have made ESG reporting more comprehensive while increasing compliance and assurance challenges.
7. **Global Reporting Initiative (GRI) (1997; GRI Standards launched in 2016)**
   GRI was established in **1997**, while the **GRI Standards** currently used for sustainability reporting were introduced in **2016**.
8. **International Sustainability Standards Board (ISSB) (2021)**
   ISSB was established by the IFRS Foundation in **2021**.
9. **Task Force on Climate-related Financial Disclosures (TCFD) (2015)**
   TCFD was established by the Financial Stability Board in **2015**, with its recommendations published in **2017**.

Research Methodology:

Research Design:

The present study adopts a **descriptive** and **analytical** approaches. The descriptive approach helps in understanding the existing ESG reporting framework in India, while the analytical approach examines students' awareness and perception of ESG reporting.

Nature of Data:

The study is based on both **primary** and **secondary data**.

Primary Data:

Primary data was collected through a structured questionnaire using **Google Forms**. The questionnaire assessed students' awareness, knowledge and perception regarding ESG reporting and awareness about BRSR.

Secondary Data:

Secondary data will be collected from:

- Securities and Exchange Board of India (SEBI)
- Ministry of Corporate Affairs (MCA)
- Business Responsibility and Sustainability Report (BRSR) Framework
- Annual Reports and Sustainability Reports of Indian companies
- Global Reporting Initiative (GRI)
- International Sustainability Standards Board (ISSB)
- Research papers
- Books
- Journals

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- Government publications
- Websites of PwC, KPMG, EY and Deloitte

Sampling Design:

Particular	Details
Population	Undergraduate Students
Sampling Technique	Convenience Sampling
Sample Size	120 Students
Area of Study	Mumbai
Research Instrument	Structured Questionnaire (Google Form)

Hypothesis:

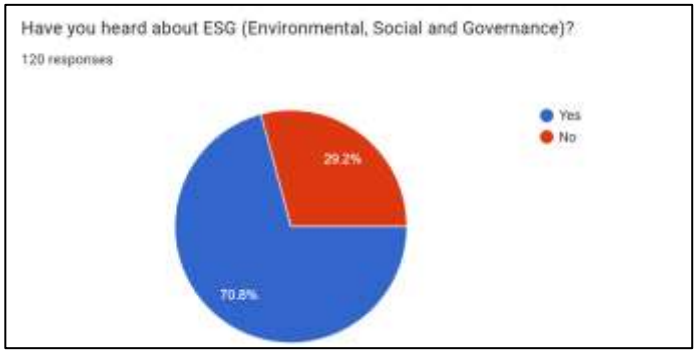
Null Hypothesis (H_0):

There is no significant association between students' awareness of ESG reporting and their awareness of BRSR.

Alternative Hypothesis (H_1):

There is a significant association between students' awareness of ESG reporting and their awareness of BRSR.

Data Analysis and Interpretation:



Data Analysis:

Out of 120 respondents, 85 (70.8%) answered Yes, while 35 (29.2%) answered No.

Interpretation:

Most students are aware of ESG, but awareness needs improvement.

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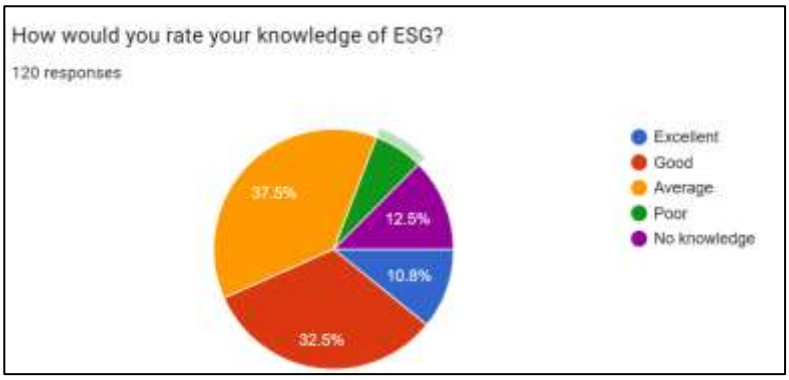


Data Analysis:

Average – 45 (37.5%)

Good – 39 (32.5%)

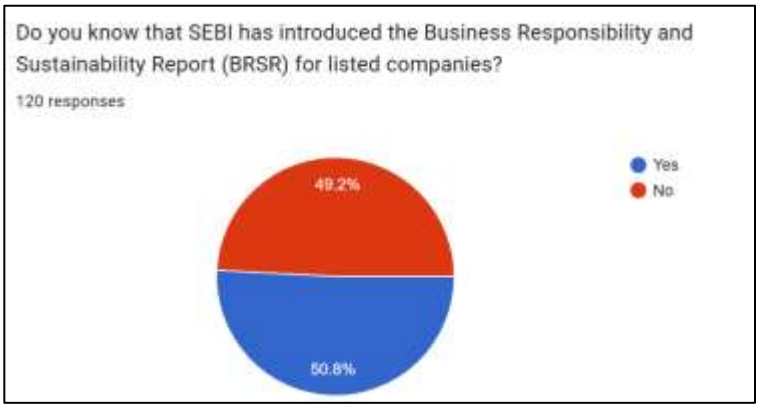
No knowledge – 15 (12.5%)

Excellent – 13 (10.8%)

Poor – 8 (6.7%)

Interpretation:

Most students have average or good ESG knowledge but need greater understanding.



Data Analysis:

Yes – 61 (50.8%)

No – 59 (49.2%)

Interpretation:

Awareness of SEBI's BRSR framework is moderate, indicating the need for greater knowledge.

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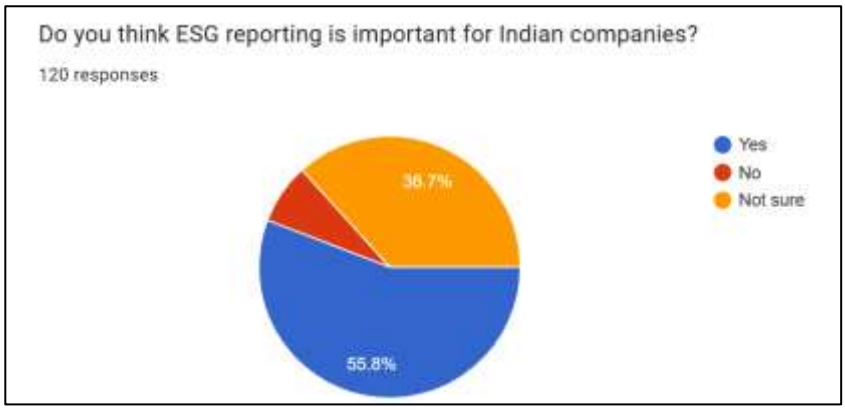


Data Analysis:

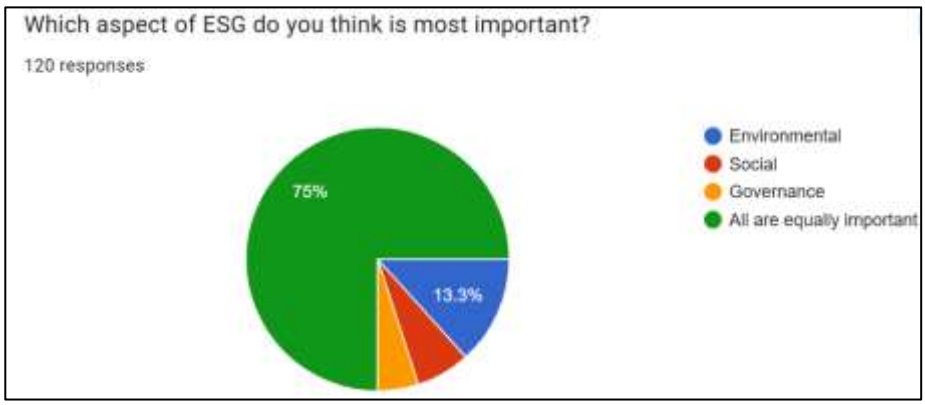
Yes – 67 (55.8%)

Not sure – 44 (36.7%)

No – 9 (7.5%)

Interpretation:

Most respondents consider ESG reporting important, while many remain uncertain about its significance.



Data Analysis:

All are equally important – 90 (75.0%)

Environmental – 16 (13.3%)

Social – 8 (6.7%)

Governance – 6 (5.0%)

Interpretation:

Most respondents believe all three ESG pillars are equally important for sustainable business.

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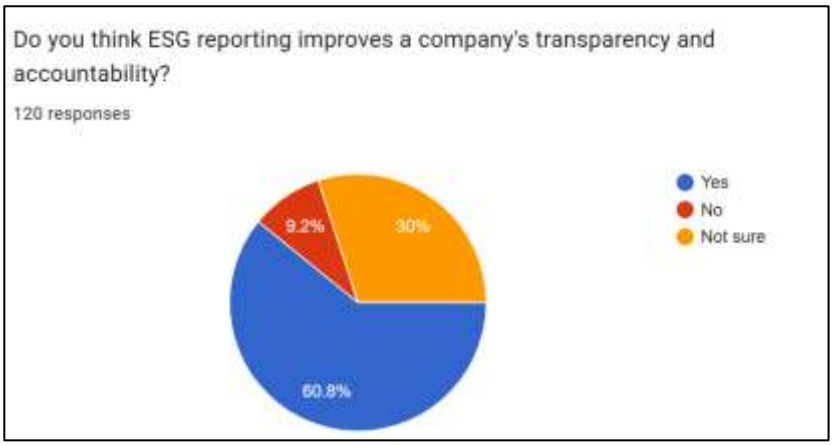


Data Analysis:

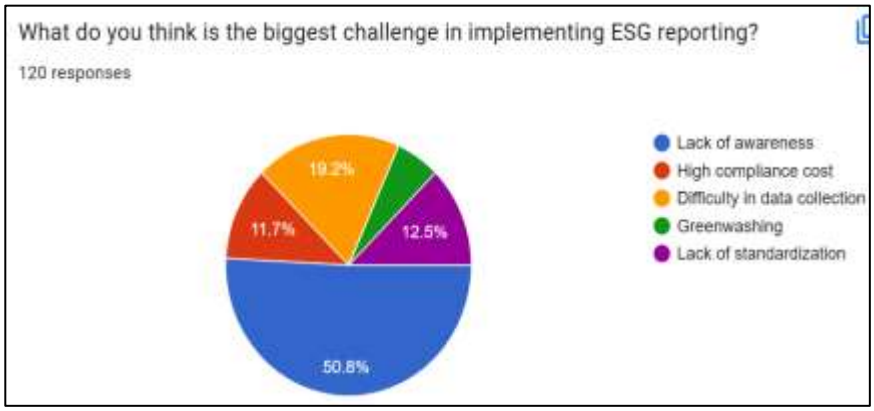
Yes – 73 (60.8%)

Not sure – 36 (30.0%)

No – 11 (9.2%)

Interpretation:

Most respondents believe ESG reporting improves transparency and accountability.



Data Analysis:

Lack of awareness – 61 (50.8%)

Difficulty in data collection – 23 (19.2%)

Lack of standardization – 15 (12.5%)

High compliance cost – 14 (11.7%)

Greenwashing – 7 (5.8%)

Interpretation:

Lack of awareness is the biggest challenge in ESG reporting.

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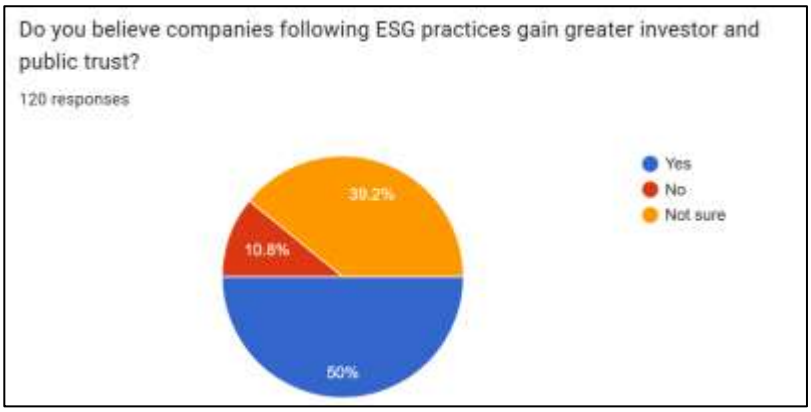


Data Analysis:

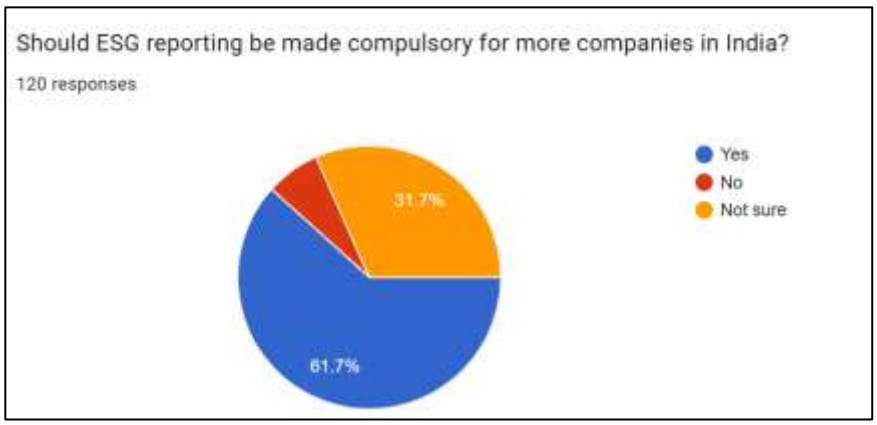
Yes – 60 (50.0%)

Not sure – 47 (39.2%)

No – 13 (10.8%)

Interpretation:

Half of the respondents believe ESG practices improve investor and public trust, while many remain uncertain.



Data Analysis:

Yes – 74 (61.7%)

Not sure – 38 (31.7%)

No – 8 (6.6%)

Interpretation:

Most respondents support making ESG reporting compulsory for more companies.

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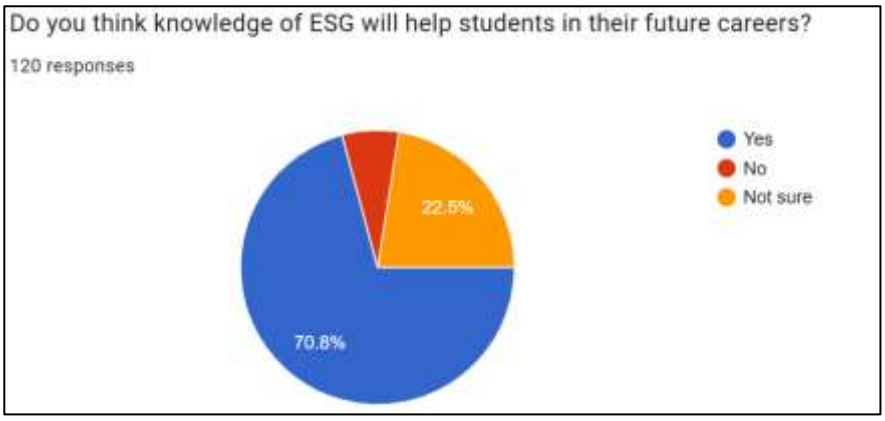


Data Analysis:

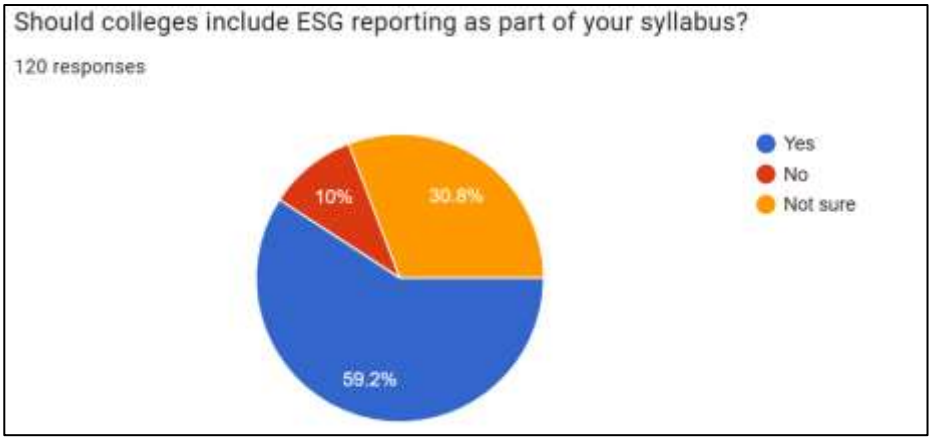
Yes – 85 (70.8%)

Not sure – 27 (22.5%)

No – 8 (6.7%)

Interpretation:

Most respondents believe ESG knowledge will benefit their future careers.



Data Analysis:

Yes – 71 (59.2%)

Not sure – 37 (30.8%)

No – 12 (10.0%)

Interpretation:

Most respondents support including ESG reporting in the college curriculum.

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Data Analysis:

Yes – 69 (57.5%)

Not sure – 37 (30.8%)

No – 14 (11.7%)

Interpretation:

Most respondents are interested in ESG-related workshops and training programmes.

Evolution of ESG Reporting:

Year	Development
2009	MCA introduced CSR Guidelines.
2011	National Voluntary Guidelines (NVGs) issued.
2012	SEBI introduced Business Responsibility Report (BRR).
2021	Business Responsibility and Sustainability Report (BRSR) replaced BRR.
FY 2022–23	BRSR became mandatory for the top 1,000 listed companies.
2023	SEBI introduced BRSR Core with 49 ESG KPIs.

ESG Reporting Framework:

SEBI regulates ESG reporting in India under **Regulation 34(2)(f)** of the SEBI (LODR) Regulations, 2015. The top 1,000 listed companies must include a **Business Responsibility and Sustainability Report (BRSR)** in their Annual Report. The framework is based on the **National Guidelines on Responsible Business Conduct (NGRBC)** and promotes disclosure on environmental, social, governance, and sustainability practices. BRSR Core strengthens reporting through measurable ESG indicators and phased assurance.

BRR, BRSR & BRSR CORE:

BRR	BRSR	BRSR Core

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Introduced in 2012	Introduced in 2021	Introduced in 2023
Top Listed Companies	Top 1,000 Listed Companies	Top 1,000 Listed Companies (Phased)
Qualitative reporting	Qualitative & quantitative reporting	Detailed Quantitative Reporting

Leading ESG Practices:

COMPANY	ESG PRACTICES	REPORTING/ DISCLOSURE AREA
Tata Steel	Renewable energy and responsible mining	**Environmental**
Infosys	Carbon neutrality and transparent reporting	**Environmental**
Mahindra & Mahindra	Electric mobility and diversity initiatives	**Environmental + Social**
ITC	Carbon positive and water positive operations	**Environmental**
HUL	Sustainable sourcing and plastic waste management	**Environmental + Social**
Reliance Industries	Renewable energy and green hydrogen investments	**Environmental**

These companies demonstrate how ESG initiatives and disclosures can extend beyond regulatory compliance and form part of broader corporate sustainability strategies.

Hypothesis Testing and Results:

1. Method used

Use the Chi-Square Test of Independence because your two variables are categorical:

- Awareness of ESG
- Awareness of BRSR

2. The Actual result

From your 120 responses:

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ESG awareness	BRSR: Yes	BRSR: No
Yes	50	35
No	11	24
Total	61	59

Chi-square value = 6.389 df = 1 p-value = 0.0115

Since $p < 0.05$, the result is statistically significant.

3. Decision

Since the p-value (0.0115) is less than the significance level of 0.05, the null hypothesis is rejected. Therefore, there is a statistically significant association between students' awareness of ESG reporting and their awareness of BRSR.

Therefore, there is a significant association between ESG awareness and awareness of BRSR among the surveyed students.

Challenges in ESG Reporting:

1. Lack of Standardisation

Different frameworks make ESG performance difficult to compare.

2. High Compliance Cost

ESG reporting requires investment in technology, data collection and verification.

3. Greenwashing

Some companies exaggerate environmental achievements, reducing ESG credibility.

4. Data Collection Challenges

Collecting reliable ESG data across departments and supply chains is difficult.

5. Lack of Awareness

Many businesses, especially SMEs, have limited understanding of ESG requirements.

6. Limited Skilled Professionals

There is a shortage of professionals trained in ESG and sustainability reporting.

Recommendations and Suggestions:

For SEBI

- Strengthen ESG reporting standards and align them with global practices.
- Improve transparency through regular monitoring and guidance.

For Companies

- Improve the quality, accuracy and transparency of ESG disclosures.
- Prevent greenwashing and conduct ESG awareness programmes.

For Educational Institutions

- Include ESG in commerce and undergraduate curricula.
- Organise ESG workshops, seminars, projects and internships.

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For Students

- Develop knowledge of ESG and sustainability practices.
- Pursue ESG certifications and stay updated with regulations.

For Government

- Promote awareness of sustainable business practices.
- Encourage industry–academic collaboration to improve ESG literacy.

Conclusion:

Environmental, Social and Governance (ESG) reporting has become an essential component of modern corporate governance and sustainable business practices. In India, the introduction of the Business Responsibility and Sustainability Report (BRSR) by SEBI has improved transparency and accountability among listed companies. Despite significant progress in developing a structured ESG reporting framework, challenges such as high compliance costs, lack of standardisation, greenwashing, and limited awareness continue to exist. The study indicates that although a majority of students possess average to good awareness of ESG, their awareness of the BRSR framework remains comparatively limited. It concludes that integrating ESG concepts into academic curricula, providing practical training, and encouraging industry engagement can improve awareness. Collaboration among regulators, companies, educational institutions, and students is essential for effective ESG implementation and sustainable business growth in India.

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A STUDY ON GREEN FINANCE AND ITS ROLE IN SUSTAINABLE ECONOMIC DEVELOPMENT

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Abstract:
Green Finance has become an important part of sustainable economic development across the world. It focuses on providing financial support to projects and businesses that protect the environment, reduce pollution, and promote the efficient use of natural resources. In recent years, governments, banks, investors, and financial institutions have started encouraging green investments to address environmental challenges such as climate change, carbon emissions, and resource depletion. This study aims to understand the concept of Green Finance, its importance, benefits, challenges, and its contribution towards sustainable economic growth. The research also examines the awareness of people regarding green financial products and the role of government policies in promoting environmentally responsible investments. Both primary and secondary data have been considered for the study. Primary data is collected through a structured questionnaire, while secondary data has been collected from journals, research papers, books, government reports, and reliable online sources.

Keywords: *Green Finance, Sustainable Development, Green Investment, Climate Change, ESG, Renewable Energy, Sustainable Banking, Green Bonds.*

Introduction:

Green Finance has become an important part of sustainable economic development in recent years. It refers to financial activities that support environmentally friendly projects such as renewable energy, green buildings, pollution control, sustainable agriculture, and clean transportation. The main objective of Green Finance is to encourage economic growth while protecting the environment.

With the increasing problems of climate change, pollution, and depletion of natural resources, governments, financial institutions, and businesses are giving more importance to sustainable investments. Green financial instruments such as green bonds, green loans, and ESG (Environmental, Social, and Governance) investments help fund projects that reduce environmental impact and promote responsible use of resources.

In India, initiatives taken by the Government, the Reserve Bank of India (RBI), and the Securities and Exchange Board of India (SEBI) have encouraged the growth of

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Green Finance. However, challenges such as limited public awareness, lack of financial knowledge, and high initial investment costs continue to affect its adoption. This study aims to understand the concept of Green Finance, examine its role in sustainable economic development, identify its benefits and challenges, and analyse people's awareness and perception towards green financial practices.

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Literature Review:

Several researchers have highlighted the growing importance of Green Finance in promoting sustainable development and environmental protection. Their studies show that financial institutions, governments, and investors play a key role in supporting environmentally responsible projects.

1. Taghizadeh-Hesary and Yoshino (2019) explained that Green Finance helps mobilize financial resources for renewable energy, clean technology, and sustainable infrastructure. Their study found that proper financial support can reduce environmental risks while promoting long-term economic growth.
2. Sachs et al. (2019) emphasized that Green Finance is an essential tool for achieving the United Nations Sustainable Development Goals (SDGs). According to the study, sustainable investments improve environmental quality and contribute to inclusive economic development.
3. International Finance Corporation (IFC, 2021) reported that developing countries have significant opportunities for green investments in sectors such as renewable energy, electric vehicles, and green buildings. The report also highlighted the need for stronger financial policies to encourage private investment.
4. Climate Bonds Initiative (2022) stated that the global Green Bond market has grown rapidly over the last few years. Green bonds have become an effective source of finance for projects related to clean energy, water conservation, and sustainable transport.
6. Reserve Bank of India (RBI, 2023) emphasized the importance of sustainable banking practices in India. The report suggested that banks should integrate environmental risk assessment into their lending decisions and encourage financing for environmentally friendly projects.
7. SEBI (2023) introduced new guidelines for ESG (Environmental, Social, and Governance) reporting to improve transparency among listed companies. The study highlighted that better disclosure helps investors make informed and sustainable investment decisions.
8. United Nations Environment Programme Finance Initiative (UNEP FI, 2022) concluded that financial institutions can significantly reduce climate-related risks

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by promoting green lending, sustainable investments, and responsible financial management.

Research Gap:

Most previous studies have focused on the role of Green Finance in developed economies or on financial institutions. Limited research has examined the level of public awareness, investment behaviour, and perception of Green Finance in the Indian context, particularly among students and young investors. Therefore, this study attempts to understand the awareness, importance, benefits, and challenges of Green Finance while examining its contribution to sustainable economic development.

Objectives of the Study:

The study aims to understand the role of Green Finance in promoting sustainable economic development. The specific objectives are:

- To understand the concept and importance of Green Finance.
- To examine the level of awareness regarding Green Finance among individuals.
- To analyse the role of Green Finance in supporting sustainable economic development.
- To identify the major benefits and challenges associated with Green Finance.
- To suggest measures for improving the adoption of Green Finance in India.

Research Methodology:

Research Design:

The study follows a descriptive research design to understand the awareness, importance, benefits, and challenges of Green Finance. It focuses on collecting opinions and analysing responses to understand people's perception of sustainable financial practices.

Data Collection:

The research is based on both primary and secondary data.

Primary Data: Collected through a structured questionnaire using Google Forms. The questionnaire consists of close-ended questions related to awareness, investment behaviour, and opinions on Green Finance.

Secondary Data: Collected from research papers, journals, books, government reports, RBI publications, SEBI reports, and reliable online sources related to Green Finance and sustainable development.

Sampling Method: The study uses Convenience Sampling because respondents are selected based on their availability and willingness to participate in the survey.

Sample Size: A total of 100 respondents participated in the survey.

Data Analysis Techniques:

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The collected data is analysed using simple statistical tools such as:
Percentage Analysis
Tables
Bar Charts
Pie Charts
These methods help present the survey findings in a simple and understandable manner.

Scope of the Study:

The study focuses on understanding the awareness and perception of Green Finance among individuals. It examines how Green Finance contributes to sustainable economic development and encourages environmentally responsible investments. The study mainly covers concepts such as green investments, renewable energy financing, green banking, ESG investments, and government initiatives. The geographical scope of the study is limited to respondents from India, and the findings are based on the responses collected during the survey.

Significance of the Study:

Green Finance has become an important tool for achieving sustainable development while protecting the environment. This study helps in understanding how financial institutions, governments, businesses, and individuals can contribute towards environmental sustainability through responsible financial decisions. It also highlights the importance of increasing public awareness about green financial products and sustainable investment opportunities. The findings of this study may be useful for students, researchers, policymakers, investors, and financial institutions interested in promoting sustainable economic growth.

Data Analysis and Interpretation:

Sample Size: 100 Respondents
Section A: Demographic Information

1.Age Group

Age group	Respondents
Below 18 years	8
18-25 years	58
26-35 years	22
36-45 years	8
Above 45 years	4
Total	**100**

Interpretation:

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The majority of respondents (58%) belong to the 18–25 age group. This indicates that young adults are more represented in the study and are likely to have greater awareness of sustainable finance and environmental issues.

- **Table 2: Gender of Respondents**

Gender	Respondents
Male	54
Female	46
Total	**100**

Interpretation:

The survey includes a balanced participation of both male and female respondents, providing a broader understanding of public awareness regarding Green Finance.

- **Occupation**

Occupation	Respondents
Student	48
Private Employee	24
Government employee	8
Business/self-employed	12
Others	8
Total	**100**

Interpretation:

Nearly half of the respondents are students, followed by private-sector employees. This suggests that the study mainly reflects the opinions of young and economically active individuals.

Section B: Awareness of Green Finance

- Are you aware of the concept of Green Finance?

Response	Respondents
Yes	68
No	32
Total	**100**

Interpretation:

Most respondents (68%) are aware of Green Finance, while 32% have limited or no knowledge. This indicates that awareness is increasing but still needs improvement.

- Which Green Finance initiative are you most familiar with?

Initiative	Respondents
Green Bonds	18

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Renewable Energy Investment	36
ESG Investing	22
Green Banking	24
Total	**100**

Interpretation:

Renewable energy investment is the most recognized Green Finance initiative among respondents, followed by Green Banking and ESG investing.

- Do you believe Green Finance supports sustainable economic development?

Response	Respondents
Strongly Agree	38
Agree	42
Neutral	12
Disagree	6
Strongly Disagree	2
Total	**100**

Interpretation:

A large majority (80%) agree that Green Finance contributes to sustainable economic development. This reflects a positive perception of environmentally responsible financial practices.

Remaining Data Analysis, Findings, Conclusion, Suggestions and References

- Would you be willing to invest in Green Finance products in the future?

Response	Respondents
Yes	72
No	10
Maybe	18
Total	**100**

Interpretation:

The majority of respondents (72%) expressed their willingness to invest in Green Finance products in the future. This indicates a positive attitude towards sustainable investments and growing confidence in environmentally responsible financial practices.

- What is the biggest challenge in promoting Green Finance?

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Challenge	Respondents
Lack of awareness	40
High Investment Cost	28
Limited Government Support	18
Lack of Financial Knowledge	14
Total	**100**

Interpretation:

Most respondents believe that the lack of public awareness is the biggest obstacle to the growth of Green Finance. High investment costs and limited policy support are also considered important challenges.

Major Findings:

The study reveals that awareness of Green Finance is gradually increasing, especially among young people. Most respondents believe that Green Finance contributes to environmental protection and sustainable economic development. Renewable energy investment and green banking are among the most recognised forms of Green Finance. The survey also shows that many respondents are willing to invest in sustainable financial products in the future. However, lack of awareness, high initial investment costs, and limited financial knowledge continue to restrict the wider adoption of Green Finance in India.

Conclusion:

Green Finance has emerged as an important financial approach for achieving sustainable economic development. It encourages investments in environmentally friendly projects while supporting long-term economic growth. The findings of this study indicate that people have a positive perception of Green Finance and recognise its role in reducing environmental challenges.

Although awareness has improved, several barriers such as limited knowledge, inadequate policy support, and higher investment costs continue to slow its growth. Increasing public awareness, improving financial literacy, and strengthening government initiatives can encourage greater participation in Green Finance. Overall, Green Finance can play a significant role in creating a cleaner environment and a more sustainable economy if supported by effective policies and responsible financial practices.

Suggestions:

Encourage banks and financial institutions to introduce more Green Finance products.
Strengthen government policies and incentives for sustainable investments.
Promote investment in renewable energy and environmentally friendly projects.
Improve transparency and ESG reporting to build investor confidence.
Encourage young investors and students to participate in sustainable investment initiatives.

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Limitation:

The study is limited to a sample of 100 respondents selected through convenience sampling, which may not represent the entire population. The research is based mainly on respondents' opinions and is restricted to India. Time constraints and limited availability of secondary data may also affect the overall findings.

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CIRCULAR ECONOMY ADOPTION AND ESG REPORTING: EVIDENCE FROM INDIA

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Abstract:
India's circular economy transition is regulation- and disclosure-driven, but what do citizens know and do? This study measures public awareness and behavior, identifies barriers and channels for awareness-raising, tests the association between educational qualification and awareness, and reviews India's ESG disclosure landscape. A descriptive research design with mixed methods was used. Data were collected from 100 respondents using convenience sampling and an 11-question Google Form, and were analysed using percentage and frequency distribution and a Chi-Square Test of Independence at the 5% significance level. Secondary research was done using published reports, journal articles, and other relevant resources. The study finds that 59% of respondents are aware of the concept of a circular economy and 64% are aware of Extended Producer Responsibility (EPR) regulations, but only 29% segregate waste at home while 65% repair or reuse items instead of throwing them away. The main Barrier to adoption is lack of awareness (57%) with social media being the most preferred channel for awareness-raising (76%). Educational qualification is not associated with circular economy awareness ($\chi^2 = 2.048$, $p = 0.727$). Overall, the study finds that awareness exceeds practice, and this gap is evident across education levels, and recommends targeted action for each segment as well as more nuanced ESG disclosure.

Keywords: *Circular Economy; ESG Reporting; BRSR; Extended Producer Responsibility; Sustainability; India*

Introduction:

The circular economy has emerged as a viable alternative to the traditional linear economy. With rising environmental concerns and regulatory pressures, India has begun to adopt circular economy practices, primarily through Extended Producer Responsibility (EPR) regulations and Business Responsibility and Sustainability Reporting (BRSR) standards. However, little is known about public awareness and attitude towards the circular economy. This study aims to fill this gap.

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1. What Is a Circular Economy?

A circular economy is an economic system where resources are used repeatedly to create goods, as opposed to a linear economy where resources are extracted, used, and disposed of.

Definition: *"A circular economy is a model of production and consumption that involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products for as long as possible, thereby extending the life cycle of resources and minimising waste."*

2. Why ESG Matters to the Circular Economy

- **Environmental:** Reduces raw material extraction, cuts emissions, minimises landfill waste
- **Social:** Supports a 'just transition' for workers in new circular supply chains
- **Governance:** Transparent disclosure that promotes ESG goals without greenwashing.

3. The Rise of Circular Economy Regulation in India

- **EPR Rules:** Make producers legally responsible for e-waste/plastic waste after consumer use
- **BRSR Framework:** Mandates structured ESG disclosure for top 1,000 listed companies
- **Implementation Gap:** ~4 million informal waste pickers still handle 90%+ of waste outside formal systems

4. Why This Study Matters

While regulation and disclosure have advanced, little is known about how citizens actually understand and practise circularity — the gap this study addresses.

Objectives:

1. To assess awareness of the Circular Economy concept and EPR regulations among respondents.
2. To examine self-reported behavior on waste segregation, packaging choice, and repair/reuse.
3. To evaluate respondent attitudes toward corporate ESG and recycling disclosure.
4. To identify the biggest perceived barriers and the most effective awareness channels.
5. To analyse the association between educational qualification and Circular Economy awareness.

Importance:

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1. **Understanding the Awareness-Practice Gap:** Highlights how far citizen behavior has kept pace with regulation
2. **Citizen Awareness Assessment:** Measures actual knowledge of CE and EPR
3. **Perception Analysis:** Evaluates trust in corporate ESG disclosure.

Literature Review:

Ellen MacArthur Foundation (2013):

Introduced the foundational circular economy framework built on three principles. Eliminating waste and pollution by design, circulating materials at highest value, and regenerating nature.

ICAI Sustainability Reporting Standards Board (2024):

Traced India's shift from voluntary reporting to mandatory BRSR disclosure. Found BRSR introduced structured, principle-based disclosure for the top 1,000 listed companies from FY 2022-23.

Zaidi, A. A. & Chandra, R. (2025):

Studied willingness of 667 Indian consumers to participate in circular fashion. Found adoption was shaped significantly by age, education, income, and gender.

Circular Economy and Sustainability, Springer (2026), using a qualitative secondary-research approach, projected that India's circular economy market may grow from approximately USD 149.86 billion in 2024 to USD 355–380 billion by 2030, while cautioning that policy ambition continues to outpace ground-level implementation and community participation. This projection supports the present study's framing of circular economy as a rapidly growing but unevenly adopted area in India.

Kapoor, N., Prasad, R., Roy, J. S., Prasad, S. P., and Mathur, A. (2026), examined the psychological, economic, and infrastructural drivers of circular consumption willingness among Indian youth, providing a consumer-centric framework linking individual decision-making to circular practice adoption. This study supports the present research's use of survey-based primary data to capture individual-level awareness and behaviour.

Research Methodology:

Research Design: Descriptive and mixed-method.

Data Sources:

- **Primary Data:** Structured questionnaire circulated via Google Forms (Sample size: 100).
- **Sampling Method:** Convenience sampling.
- **Secondary Data:** Regulatory publications (SEBI's BRSR, ICAI), academic journals, industry reports.

Hypotheses:

H0 – No association between Educational Qualification and Awareness of Circular

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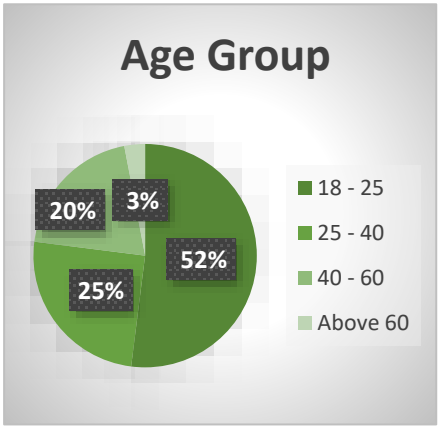
Economy.

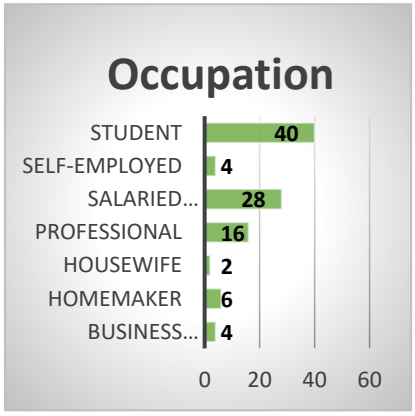
H1 – Educational Qualification and Awareness of Circular Economy are associated.

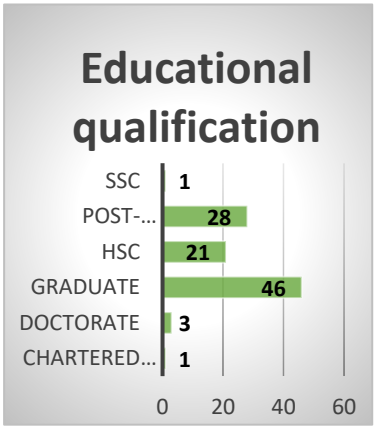
Limitations:

1. Small sample size of 100 restricts statistical generalisability[BP1].
2. Convenience sampling introduces bias as the sample cannot be assumed to represent the population.
3. Self-reported behavioural data is subject to memory and honesty bias.
4. Cross-sectional design does not allow assessment of changes over time.
5. Educational qualification was the only predictor tested for association with awareness; other variables (income, occupation, geography) were not controlled.
6. Secondary research relies on projections that may not materialize.
7. BRSR/ESG disclosure review is based on published literature rather than actual company filings.
8. 11-question survey limits depth of qualitative analysis.

Data Analysis and Interpretation:







- 52% are 18–25; sample skews young.
- 40% students, 28% salaried; mirrors the youth skew.
- 74% graduate or above; very few in lower bands.

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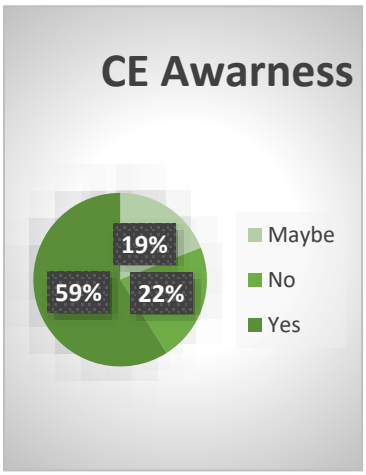
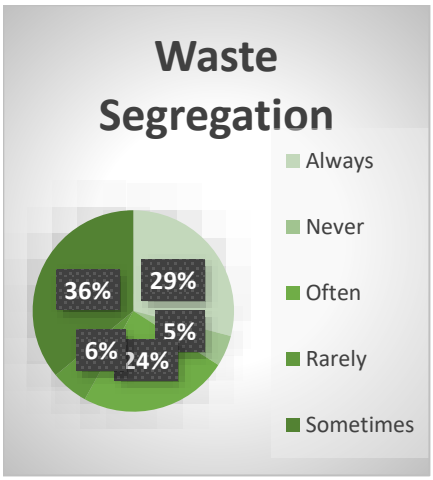
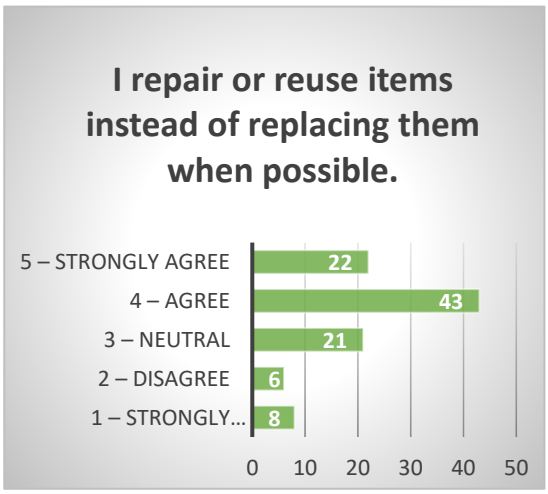




- 59% Yes, 22% No, 19% Maybe — awareness isn't universal despite high education.
- 64% Yes, 19% No, 17% Maybe — slightly higher than CE awareness, likely because it's tied to a specific rule rather than an abstract concept.
- Only 29% "Always" segregate; 36% only "Sometimes" — the clearest awareness-practice gap in the survey.



- 47% Agree/Strongly Agree they prefer recyclable packaging; 37% neutral — price sensitivity likely tempers stronger commitment.
- 65% Agree/Strongly Agree they repair or reuse — the strongest pro-circular behaviour recorded, well ahead of segregation or packaging habits.

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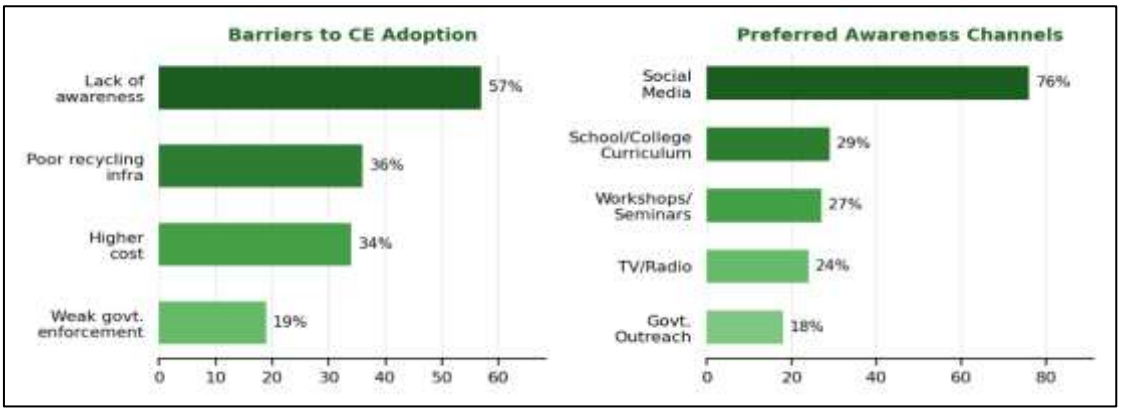

'Lack of awareness' is the most-cited barrier (57%), ahead of poor recycling infrastructure (36%) and higher cost (34%). Social media dominates as the preferred awareness channel (76%), well ahead of school/college curricula (29%) — consistent with the sample's youth skew.

Overall Interpretation: Awareness (58–65%) consistently outpaces consistent practice (29% waste segregation), showing that knowing about circular economy doesn't automatically translate into daily habit — except for repair/reuse, which succeeds because it's driven by convenience and cost-saving, not environmental awareness.

Hypothesis Testing:

Statistical Tool Used: Chi-Square (χ^2) Test of Independence, at the 5% level of significance, testing:

H_0 – No association between Educational Qualification and Awareness of Circular Economy.

H_1 – Educational Qualification and Awareness of Circular Economy are associated.

Educational qualification was originally recorded in six categories, several of which had very small counts (Doctorate, SSC, Chartered Accountant). Cells with very low expected frequencies violate the assumptions of the Chi-Square test, so these were regrouped into three statistically valid categories: **'Up to HSC'**, **'Graduate'**, and **'PG & above'**. Awareness was kept in its original three categories: Yes, Maybe, No.

Observed Frequency Table (O)				
Education	**Yes**	**Maybe**	**No**	**Total**
Up to HSC	12	5	5	22
Graduate	25	10	11	46
PG & above	22	4	6	32
Total	**59**	**19**	**22**	**100**

Expected Frequency Table €			
E = (Row Total × Column Total) / Grand Total			
Education	**Yes**	**Maybe**	**No**

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Up to HSC	12.98	4.18	4.84
Graduate	27.14	8.74	10.12
PG & above	18.88	6.08	7.04

All expected cell frequencies exceed 4 (Cochran's rule satisfied) — the test is validly applied.

Calculation of $\chi^2 = \Sigma[(O - E)^2 / E]$			
O	**E**	**$(O-E)^2$**	**$(O-E)^2/E$**
12	12.98	0.96	0.074
5	4.18	0.67	0.161
5	4.84	0.03	0.005
25	27.14	4.58	0.169
10	8.74	1.59	0.182
11	10.12	0.77	0.077
22	18.88	9.73	0.516
4	6.08	4.33	0.712
6	7.04	1.08	0.154
		χ^2 (calculated)	**2.048**

Degrees of Freedom, Critical Value and Decision

- Degrees of freedom = $(r - 1)(c - 1) = (3 - 1)(3 - 1) =$ **4**
- Critical value of χ^2 at 4 d.f., 5% significance = **9.488**
- Calculated χ^2 = **2.048**; p-value = **0.727**

Since the calculated χ^2 (2.048) is less than the critical value (9.488), and p = 0.727 $\gg$ 0.05, **H_0 is accepted and H_1 is rejected**.

Interpretation: Educational qualification has no statistically significant association with Circular Economy awareness. Awareness is fairly evenly spread across education levels — PG & above (68.75% aware), Graduate (54.3%), and Up to HSC (54.5%) — confirming that the awareness gap identified in this study cuts across education levels rather than concentrating in less-educated segments, and that outreach efforts should therefore be broad-based rather than targeted by qualification.

Findings:

General Findings:

- Circular economy awareness is moderate, but consistent practice lags behind.
- Regulatory awareness (EPR) is higher than conceptual awareness (Circular Economy).
- Repair/reuse behaviour is strong; waste segregation is weak.
- Trust in corporate disclosure is comparatively high.

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- Youth and graduates dominate the sample, yet education has no bearing on awareness.

Specific Findings:

- **59%** aware of the Circular Economy concept — 64% aware of EPR rules.
- **Only 29%** always segregate waste at home, despite majority awareness.
- **65%** repair or reuse items instead of replacing them — the strongest pro-circular behaviour recorded.
- **57%** cite "lack of awareness" as the biggest barrier to adoption.
- **76%** prefer social media as the most effective awareness channel.
- **No significant association** between education and awareness ($\chi^2 = 2.048$, $p = 0.727$) — the gap cuts across all education levels equally.

Research Gaps:

- Limited Indian research linking citizen-level awareness with ESG disclosure.
- Insufficient empirical testing of demographic drivers of circular economy awareness.
- Lack of studies combining behavioural data with regulatory disclosure review.
- Long-term, longitudinal tracking of awareness-practice gap remains unexplored.

Suggestions:

1. **Broad-based awareness campaigns:** target all education levels via mass/social media.
2. **Granular BRSR disclosure:** push regulators for detailed environmental value-chain reporting.
3. **Public disclosure by businesses:** communicate recycling practices to build consumer trust.
4. **Curriculum integration:** embed circular economy concepts in school/college education.
5. **Practice-oriented messaging:** shift from conceptual awareness campaigns to habit-formation nudges.

Conclusions:

Awareness of circular economy principles in India is moderate and evenly spread across education levels, but consistently outpaces actual practice — most visibly in waste segregation. Since education does not predict awareness, India's challenge is not educational but communicational: closing the gap requires coordinated, practice-focused action from policymakers, regulators, businesses, and educational institutions alike.

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Recommendations:

1. **Broad-based awareness campaigns:** Run mass and social media campaigns targeting all education levels, since awareness has no significant link to education ($\chi^2 = 2.048$, $p = 0.727$).
2. **Granular BRSR disclosure:** Regulators (SEBI/ICAI) should push for more detailed, standardised reporting of environmental value-chain metrics, not just principle-level disclosure.
3. **Public disclosure by businesses:** Companies should proactively communicate recycling/waste-management practices — 58% of respondents say this builds trust.
4. **Curriculum integration:** Embed circular economy concepts into school and college syllabi, given its cited effectiveness (29%) as an awareness channel.
5. **Practice-oriented messaging:** Shift communication from conceptual awareness ("what is a circular economy") to practice-focused nudges — convenience, defaults, and incentives — to close the gap between knowing and doing.
6. **Leverage social media specifically:** Since 76% prefer this channel, prioritize short-form, high-reach content (reels, infographics) over traditional formats like TV/radio or government outreach programs.
7. **Target habit formation, not just information:** Since repair/reuse (65%) succeeds mainly due to cost-saving rather than awareness, design incentives (discounts, rebates) around waste segregation and packaging choices to make sustainable behaviour equally convenient.

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THE ROLE OF UPI AND CASHLESS PAYMENT SYSTEMS IN PROMOTING ENVIRONMENTAL SUSTAINABILITY: AN EMPIRICAL STUDY

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Abstract:
The rapid growth of Unified Payments Interface (UPI) and other cashless payment systems has significantly transformed India's digital payment ecosystem by promoting secure, convenient and efficient financial transactions. Beyond their economic and technological advantages, digital payment systems have the potential to contribute to environmental sustainability by reducing dependence on paper currency, printed receipts and cash-handling processes that consume natural resources and energy. However, limited empirical research has examined consumers' perceptions of the environmental benefits associated with UPI and cashless payment systems. This study aims to investigate the role of UPI and cashless payment systems in promoting environmental sustainability from the perspective of urban consumers. The study adopts a descriptive research design and proposes the collection of primary data through a structured questionnaire using a five-point Likert scale from UPI users in the Mumbai Suburban region. Convenience sampling will be employed, and the collected data will be analysed using descriptive statistics, Cronbach's Alpha, Chi-square test, correlation analysis, and exploratory factor analysis. The study examines consumers' awareness of the environmental benefits of digital payments, identify factors influencing UPI adoption, and assess the relationship between digital payment usage and perceptions of environmental sustainability. The findings are expected to demonstrate that increased adoption of UPI and cashless payment systems positively supports environmentally sustainable practices by reducing paper consumption, encouraging paperless transactions and promoting resource efficiency.

Keywords: *UPI, Cashless Payment Systems, Digital Payments, Environmental Sustainability, ESG, Consumer Perception, Green Finance*

Introduction:

The rapid advancement of digital technology has transformed the global financial landscape, leading to significant changes in the way individuals and businesses conduct financial transactions. The emergence of digital payment systems has reduced dependence on traditional cash-based transactions by providing faster,

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safer, and more convenient payment solutions. In India, the Government's vision of a digitally empowered economy, supported by initiatives such as Digital India, the introduction of the Unified Payments Interface (UPI), and increasing smartphone penetration, has accelerated the adoption of cashless payment systems across urban and rural areas.

Digital payment systems offer numerous economic and social benefits, including enhanced financial inclusion, improved transaction efficiency, reduced operational costs, and greater transparency in financial transactions. However, their contribution extends beyond financial convenience. The growing adoption of UPI and other cashless payment systems has the potential to support environmental sustainability by reducing the consumption of paper currency, minimising the use of printed receipts, decreasing transportation requirements for cash distribution, and lowering the environmental costs associated with cash management.

Environmental sustainability has become a key priority for governments, businesses, financial institutions, and consumers worldwide. Climate change, resource depletion, deforestation, and increasing carbon emissions have intensified the need for sustainable business practices that minimise environmental impact. The financial sector has also embraced sustainability by promoting digital innovation that reduces the ecological footprint of financial operations.

The present study seeks to examine the role of UPI and cashless payment systems in promoting environmental sustainability from the perspective of urban consumers. Specifically, the study aims to assess consumers' awareness of the environmental benefits associated with digital payments, identify the factors influencing UPI adoption and analyse the relationship between the use of cashless payment systems and perceptions of environmental sustainability.

Review of Literature:

1. **Mahesh A. and Bhat, G. (2021)**, examined the growth and significance of the Unified Payments Interface (UPI) in India's digital payment ecosystem. The study concluded that UPI has transformed the payment landscape by providing a secure, fast, and cost-effective platform for digital transactions. It also highlighted that government initiatives and increasing smartphone penetration have significantly accelerated the adoption of UPI across the country.
2. **Bhavsar and Samanta (2021)**, investigated the sustainability of digital payments in India and found that digital payment systems contribute to economic development and support the achievement of Sustainable Development Goals (SDGs). The study emphasised that a robust digital payment ecosystem can reduce dependence on traditional cash transactions and promote sustainable financial practices.

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3. **Reserve Bank of India (2024)**, reported that UPI has revolutionised India's retail payment ecosystem through secure, interoperable, and real-time payment services. The report highlighted that continuous innovations in digital payment infrastructure have improved financial inclusion, transaction efficiency, and reduced dependence on cash-based transactions.
4. **National Payments Corporation of India (NPCI) (2024)**, highlighted the organisation's commitment to Environmental, Social and Governance (ESG) practices. The report stated that initiatives such as green-certified data centres, renewable energy adoption, paperless operations, and digital payment innovations have reduced dependence on physical cash and supported environmentally sustainable payment systems.

Research Gap:

1. Existing studies have mainly focused on the adoption, convenience, and security of UPI and digital payment systems.
2. The role of UPI in supporting the Environmental dimension of the ESG framework remains underexplored.
3. This study addresses these gaps by examining the role of UPI and cashless payment systems in promoting environmental sustainability among urban consumers.

Statement of the Problem:

While UPI and cashless payment systems may reduce paper use, printed receipts, cash logistics and physical travel, consumers may not fully recognise these environmental benefits. Existing research has focused mainly on convenience, security, adoption and financial inclusion. Hence, empirical evidence on consumers' environmental awareness and the relationship between UPI usage and perceived sustainability is needed.

Objectives of the Study:

- To examine consumers' awareness of the role of UPI and cashless payment systems in promoting environmental sustainability.
- To identify the factors influencing the adoption of UPI and cashless payment systems among urban consumers.
- To analyse the relationship between UPI/cashless payment usage and perceived environmental sustainability.

Research Hypotheses:

H_0: There is no significant level of awareness among consumers regarding the role of UPI and cashless payment systems in promoting environmental sustainability.

H_1: There is a significant level of awareness among consumers regarding the role of UPI and cashless payment systems in promoting environmental sustainability.

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H₀: There is no significant influence of the identified factors on the adoption of UPI and cashless payment systems among urban consumers.

H₁: There is a significant influence of the identified factors on the adoption of UPI and cashless payment systems among urban consumers.

H₀: There is no significant relationship between UPI/cashless payment usage and consumers' perceived environmental sustainability.

H₁: There is a significant relationship between UPI/cashless payment usage and consumers' perceived environmental sustainability.

Research Methodology:

The study adopted a descriptive research design and quantitative approach. Primary data were collected through a structured questionnaire containing demographic items and five-point Likert-scale statements (1=Strongly Disagree to 5=Strongly Agree). Secondary information was obtained from research articles, books, RBI and NPCI reports, and relevant online sources. Convenience sampling was used to obtain responses from 125 UPI users residing in the Mumbai Suburban region. Data were analysed using IBM SPSS Statistics. Frequency, percentage, mean and standard deviation were used for descriptive analysis; Chi-square tested the association between UPI frequency and environmental awareness, and Pearson's correlation examined the relationship between UPI usage intensity and perceived environmental sustainability.

Data Analysis and Interpretation:

1. Demographic Profile

The sample comprised 68 males (54.4%), 55 females (44.0%) and 2 respondents (1.6%) who selected other/prefer not to say. Respondents aged 18–35 constituted 72.0% of the sample. UPI use was frequent: 70 respondents (56.0%) used it daily and 35 (28.0%) weekly, so 84.0% used UPI at least weekly.

Variable	Category	n	%
Gender	Male	68	54.4
	Female	55	44.0
	Other / Prefer not to say	2	1.6
Age	18–25	42	33.6
	26–35	48	38.4
	36–45	22	17.6
	46+	13	10.4
UPI frequency	Daily	70	56.0
	Weekly	35	28.0
	Monthly	15	12.0
	Rarely	5	4.0

2. Objective 1: Awareness of Environmental Benefits

Awareness statement	Mean	SD
UPI reduces reliance on paper currency	4.12	0.68

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Cashless payments reduce paper receipts/passbooks	3.98	0.75
Digital payments lower carbon impacts of cash logistics	3.45	0.89
UPI reduces physical bank/ATM visits	4.05	0.71
Overall awareness that UPI supports sustainability	3.86	0.80

Awareness was highest for reduced reliance on paper currency (M=4.12) and fewer bank/ATM visits (M=4.05). Awareness of reduced carbon impacts from cash logistics was comparatively moderate (M=3.45). Overall, 44.0% showed high awareness and 41.6% moderate awareness, giving 85.6% high-to-moderate awareness. Thus, respondents recognise visible environmental benefits more readily than indirect carbon-footprint effects.

3. Objective 2: Factors Influencing Adoption

Factor	Mean	Rank
Convenience and ease of use	4.35	1
Speed of transaction	4.21	2
Safety and security	3.95	3
Cashback / rewards	3.88	4
Government promotion	3.72	5
Peer / social influence	3.40	6
Environmental concern	3.15	7

Convenience and ease of use (M=4.35) and transaction speed (M=4.21) were the strongest adoption drivers, followed by safety/security (M=3.95) and cashback/rewards (M=3.88). Government promotion scored 3.72. Environmental concern ranked last (M=3.15), indicating that UPI adoption is currently driven more by functional and economic benefits than ecological motivation.

4. Objective 3: Relationship with Environmental Sustainability

Test	Statistic	df / N	p-value	Result
Chi-square: UPI frequency × awareness	$\chi^2=18.742$	df=6	0.005	Significant
Pearson correlation: usage intensity × perceived sustainability	r=0.548	N=125	<0.01	Significant

The Chi-square result was significant ($\chi^2=18.742$, df=6, p=0.005), indicating an association between UPI usage frequency and environmental awareness. Daily users were proportionately more represented in the high-awareness category, while less frequent users were more dispersed across moderate and low awareness.

Pearson's correlation was positive and statistically significant (r=0.548, p<0.01, N=125), indicating a moderate relationship between UPI usage intensity and perceived environmental sustainability. Greater engagement with UPI is therefore

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associated with stronger perceptions of its environmental value, although other adoption factors also influence behaviour.

Key Findings:

- 85.6% of respondents had high-to-moderate awareness of the environmental benefits of UPI.
- Paper reduction and fewer physical bank/ATM visits were the most clearly recognised benefits; indirect carbon-footprint benefits were less understood.
- Convenience, transaction speed and security were the leading adoption factors; environmental concern was the weakest.
- UPI frequency was significantly associated with environmental awareness ($\chi^2=18.742$, $p<0.01$).
- UPI usage intensity had a significant moderate positive correlation with perceived environmental sustainability ($r=0.548$, $p<0.01$).

Recommendations:

- RBI, NPCI and banks should communicate less-visible environmental benefits such as reduced paper use, cash logistics and ATM energy consumption.
- Policymakers and financial institutions can connect digital payment growth with ESG reporting and resource-efficiency indicators.
- Frequent UPI users can be used as sustainability ambassadors through practical awareness campaigns.

Conclusion:

This study set out to examine consumers' awareness of the role of UPI and cashless payment systems in promoting environmental sustainability, to identify the factors influencing their adoption among urban consumers, and to analyse the relationship between UPI usage and perceived environmental sustainability. The findings suggest that urban consumers in the Mumbai Region are, on the whole, aware that UPI and cashless payment systems contribute to environmental sustainability, though this awareness is stronger for direct, visible benefits than for indirect ecological outcomes such as reduced carbon emissions. Adoption of UPI continues to be driven primarily by functional considerations convenience, speed and security rather than environmental concern, indicating that sustainability is, at present, a secondary rather than primary motivator. Nevertheless, the significant association between frequency of usage and environmental awareness, along with the moderate positive correlation between usage intensity and perceived sustainability, confirms that greater engagement with digital payment systems is linked with a stronger perception of their environmental value. The study concludes that while UPI and cashless payment systems hold genuine promise as instruments of environmental sustainability, realising this potential fully will require deliberate awareness-building

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efforts by regulators, banks, and fintech providers to shift environmental concern from a peripheral to a central driver of digital payment adoption.

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ESG REGULATIONS IN INDIA AND GLOBAL MARKETS: A COMPARATIVE ANALYSIS OF EMERGING REGULATORY FRAMEWORKS, DISCLOSURE STANDARDS AND CORPORATE IMPLICATIONS

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Abstract:
Environmental, Social and Governance (ESG) considerations have evolved from voluntary corporate sustainability initiatives into an increasingly regulated component of capital markets. Governments, securities regulators, stock exchanges and international standard-setting bodies are introducing disclosure frameworks to improve transparency, comparability and accountability in corporate sustainability performance. India has emerged as an important market in this transition through the Securities and Exchange Board of India's (SEBI) Business Responsibility and Sustainability Reporting (BRSR) framework and the development of BRSR Core, assurance/assessment requirements and value-chain disclosures. Globally, regulatory approaches differ considerably. The European Union has developed an extensive sustainability reporting regime through the Corporate Sustainability Reporting Directive (CSRD) and European Sustainability Reporting Standards (ESRS), while the International Sustainability Standards Board (ISSB) has established IFRS S1 and IFRS S2 as a global baseline for sustainability-related financial disclosures. The United Kingdom is moving from its TCFD-aligned framework towards UK Sustainability Reporting Standards, while the United States has experienced a more uncertain regulatory trajectory concerning mandatory climate disclosures.

This paper examines the evolution of ESG regulation in India and selected global markets, compares major regulatory frameworks, identifies implementation challenges and evaluates their implications for corporations, investors and other stakeholders. The paper argues that ESG regulation is moving towards greater standardisation, assurance and integration with financial decision-making. However, differences in materiality concepts, reporting boundaries, regulatory scope and implementation costs continue to create challenges for multinational companies. India has an opportunity to position its ESG reporting architecture as a globally compatible yet context-sensitive framework.

Keywords: *ESG, BRSR, SEBI, Sustainability Reporting, CSRD, ESRS, ISSB, IFRS S1, IFRS S2, Greenwashing, Sustainable Finance*

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Introduction:

Environmental, Social and Governance (ESG) has become a significant element of contemporary corporate governance and investment decision-making. Traditionally, environmental and social initiatives were largely associated with corporate social responsibility (CSR), philanthropy and voluntary sustainability programmes. However, the increasing financial consequences of climate change, resource scarcity, social inequalities, supply-chain disruptions and governance failures have transformed ESG into a matter of strategic and financial importance.

Investors increasingly require information regarding how companies manage sustainability-related risks and opportunities. Reliable ESG information can influence investment decisions, cost of capital, corporate reputation, access to finance and long-term business resilience. Consequently, regulators across jurisdictions are shifting from voluntary sustainability reporting towards mandatory or semi-mandatory disclosure regimes.

The regulatory landscape, however, remains fragmented. India has developed the BRSR framework under SEBI, while the European Union has introduced CSRD and ESRS. At the global level, the ISSB's IFRS S1 and IFRS S2 seek to establish a common baseline for sustainability-related financial disclosures. The United Kingdom is transitioning towards ISSB-aligned UK Sustainability Reporting Standards, whereas the United States has taken a more cautious and contested approach to mandatory climate disclosure.

The regulatory debate therefore extends beyond whether ESG should be disclosed. The central questions concern what should be disclosed, to whom, according to which standards, with what degree of assurance, and how the information should influence corporate and investment decisions.

Objectives of the Study:

The study has the following objectives:

1. To examine the evolution of ESG regulations in India.
2. To analyse the major ESG and sustainability disclosure frameworks in global markets.
3. To compare India's BRSR framework with international approaches such as CSRD/ESRS and ISSB.
4. To examine emerging regulatory trends concerning assurance, value-chain reporting and greenwashing.
5. To identify the challenges faced by companies in implementing ESG regulations.
6. To suggest measures for strengthening India's ESG regulatory ecosystem.

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Research Methodology:

The paper adopts a descriptive and comparative research methodology. It is primarily based on secondary data collected from regulatory authorities, international standard-setting institutions, government publications and official sustainability-reporting documents. Major sources include SEBI, the European Commission, the IFRS Foundation/ISSB, the UK Financial Conduct Authority (FCA) and the U.S. Securities and Exchange Commission (SEC).

The analysis focuses on regulatory developments and reporting frameworks rather than measuring the ESG performance of individual companies.

ESG Regulatory Framework in India:

1. Emergence of BRSR

India's ESG reporting journey has developed progressively through SEBI's regulatory framework. The earlier Business Responsibility Report evolved into the **Business Responsibility and Sustainability Report (BRSR)**, reflecting a transition from broad corporate responsibility disclosures towards more structured sustainability reporting.

BRSR is particularly significant because it brings ESG information into the mainstream corporate reporting architecture. It requires disclosures covering environmental performance, social responsibility and governance-related indicators.

The framework is aligned with the **National Guidelines on Responsible Business Conduct (NGRBC)** and is intended to improve the availability of standardised information for investors and stakeholders.

The BRSR framework is therefore important not merely as a reporting requirement but as a mechanism for integrating sustainability considerations into corporate governance and investor communication.

2. BRSR Core

A major development in India's ESG regulatory architecture is the introduction of **BRSR Core**, which focuses on a selected set of key ESG indicators. The objective is to make sustainability disclosures more focused, measurable and reliable.

The emphasis on core indicators reflects an important regulatory shift: ESG reporting is moving from narrative statements towards **quantitative and verifiable metrics**.

This is particularly important because investors often face difficulties in comparing ESG performance across companies when disclosures are predominantly qualitative. BRSR Core seeks to improve comparability and reduce the possibility of selective reporting.

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3. ESG Assurance and Assessment

Another important development is the movement towards independent assurance or assessment of ESG information. As ESG data increasingly influences investment decisions, concerns regarding reliability, accuracy and greenwashing have increased.

SEBI's March 2025 circular introduced measures relating to the framework for assurance or assessment, ESG disclosures for the value chain and voluntary disclosure concerning green credits.

The regulatory focus on assurance is significant because ESG information increasingly resembles financial information in its importance to capital markets. Companies therefore need appropriate systems, internal controls, documentation and data governance mechanisms to support sustainability disclosures.

4. Value-Chain ESG Disclosures

ESG risks do not necessarily originate within a company's direct operations. Environmental emissions, labour conditions, human rights concerns, responsible sourcing and supply-chain governance can arise throughout the value chain.

Consequently, India's ESG regulatory framework is increasingly recognising the importance of value-chain information. SEBI's 2025 measures addressed ESG disclosures relating to the value chain, while also seeking to facilitate ease of doing business.

This development is particularly relevant for Indian companies participating in global supply chains. International customers and investors increasingly expect information concerning suppliers, emissions, labour practices and responsible sourcing.

5. ESG Regulations in Global Markets

1. International Sustainability Standards Board (ISSB)

One of the most significant global developments is the creation of the **International Sustainability Standards Board (ISSB)** under the IFRS Foundation.

In June 2023, the ISSB issued **IFRS S1 – General Requirements for Disclosure of Sustainability-related Financial Information** and **IFRS S2 – Climate-related Disclosures**. The standards are designed to establish a global baseline for sustainability-related financial information useful to investors.

IFRS S1 focuses on sustainability-related risks and opportunities that could reasonably be expected to affect an entity's cash flows, access to finance or cost of capital over the short, medium or long term. IFRS S2 specifically addresses climate-related risks and opportunities.

The ISSB approach is therefore strongly connected to **financial materiality**

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and investor decision-making.

The importance of ISSB is evident in its growing international adoption. By February 2026, the IFRS Foundation reported that nearly 40 jurisdictions had taken steps towards adopting or otherwise using ISSB Standards, with requirements already in effect in 19 jurisdictions.

This suggests that ISSB is increasingly becoming an international reference point for sustainability reporting.

6. EUROPEAN UNION: CSRD AND ESRS

The European Union has established one of the world's most comprehensive sustainability reporting frameworks through the **Corporate Sustainability Reporting Directive (CSRD)** and **European Sustainability Reporting Standards (ESRS)**.

The CSRD requires companies within its scope to report information relating to sustainability risks and opportunities and the impacts of their activities on people and the environment. Companies subject to CSRD report according to ESRS.

The European approach is distinctive because it places considerable emphasis on both:

1. The impact of sustainability issues on the company; and
2. The company's impact on people and the environment.

This broader approach is associated with the concept of **double materiality**.

In July 2026, the European Commission adopted revised ESRS intended to simplify reporting and reduce administrative burdens while maintaining high-quality disclosures. The revised standards cover issues including climate change, biodiversity and human rights.

The EU experience demonstrates that ESG regulation is not static. Regulators are attempting to balance two competing objectives: **high-quality sustainability information and proportional compliance costs**.

7. United Kingdom: TCFD, ISSB and Sustainability Disclosure Requirements

The United Kingdom has developed a multi-layered sustainability reporting framework.

The Financial Conduct Authority introduced TCFD-aligned disclosure requirements for listed companies and financial institutions. The UK is now moving towards greater alignment with ISSB standards.

In January 2026, the FCA consulted on proposals to replace existing TCFD-aligned rules for listed companies with requirements aligned with UK Sustainability Reporting Standards (UK SRS). The proposed approach aims to improve comparability while taking account of implementation readiness.

8. United States: Regulatory Uncertainty

The United States presents a contrasting approach to ESG regulation.

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The U.S. Securities and Exchange Commission adopted climate-related disclosure rules in March 2024. However, implementation was subsequently stayed amid legal challenges. In March 2025, the SEC voted to end its defence of the rules.

In May 2026, the SEC proposed rescinding the climate-related disclosure rules entirely, arguing that they exceeded the Commission's statutory authority and imposed costs that were not justified by the expected informational benefits.

9. Comparative Analysis of ESG Regulatory Frameworks

Dimension	India	European Union	ISSB	United Kingdom	United States
Major Framework	BRSR/BRSR Core	CSRD/ESRS	IFRS S1/S2	UK SRS/SDR	SEC climate disclosure framework
Primary Focus	ESG reporting and corporate responsibility	Sustainability impacts and financial risks	Investor-focused sustainability information	Sustainability and investment-product transparency	Financially material climate information
Materiality	ESG and sustainability indicators	Double materiality	Financial materiality	Increasing ISSB alignment	Financial materiality
Value Chain	Increasingly recognised	Significant relevance	Relevant where material	Relevant depending on requirements	More limited
Assurance	Increasing emphasis	Strong assurance orientation	Jurisdiction-dependent	Increasing attention	Subject to applicable rules
Greenwashing	Emerging regulatory concern	Strong policy concern	Disclosure-oriented	Explicit anti-greenwashing rules	Regulatory approach differs
Global Alignment	Increasing	Region-specific but influential	Global baseline	Strong ISSB orientation	More domestically focused

The comparison reveals that **there is no single global ESG regulatory model**. Instead, convergence is occurring around certain common principles such as materiality, governance, risk management, metrics, targets and climate-related information.

10. MAJOR CHALLENGES IN ESG REGULATION

1. Lack of Global Harmonisation

Different jurisdictions use different definitions, reporting boundaries and materiality concepts. This creates difficulties for multinational companies operating across markets.

A company may therefore have to prepare different sustainability disclosures for India, the EU, the UK and other jurisdictions.

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2. Data Quality and Reliability

ESG data is often generated from multiple internal and external sources. Unlike traditional accounting information, ESG metrics can involve estimates, assumptions and complex supply-chain data.

Companies need robust systems for data collection, verification, storage and reporting.

3. Cost of Compliance

ESG compliance can involve substantial costs related to technology, consultants, assurance providers, employee training and data systems.

Smaller companies may find these requirements particularly challenging. The EU's recent simplification of ESRS reflects the growing recognition that sustainability reporting must be proportionate to corporate capacity.

4. Greenwashing

Greenwashing occurs when a company or financial product presents itself as more environmentally or socially responsible than its actual performance suggests.

Increasing regulatory attention to greenwashing indicates a transition from merely requiring disclosure to ensuring that sustainability claims are **credible, evidence-based and transparent**.

The UK's anti-greenwashing framework is an example of this trend.

5. Supply-Chain Complexity

Scope 3 emissions, labour conditions, human rights, responsible sourcing and supplier governance can be difficult to measure.

For Indian businesses integrated into global value chains, this challenge is particularly important because overseas customers may require sustainability information beyond the minimum requirements of Indian regulations.

11. Implications for Indian Companies

ESG regulation presents both challenges and strategic opportunities for Indian businesses.

First, companies need to move from a **compliance-oriented approach to a strategic ESG approach**. Sustainability information should be integrated into corporate strategy, risk management, capital allocation and board-level decision-making.

Second, companies should develop strong internal ESG data systems. ESG information should be subjected to internal controls similar to those applied to financial information.

Third, boards need to strengthen their understanding of climate risks, social issues, human rights, cybersecurity, employee welfare, business ethics and stakeholder relationships.

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Fourth, Indian companies should anticipate increasing global convergence with ISSB standards. This is particularly important for companies seeking foreign capital or participating in international supply chains.

Finally, ESG performance can become a source of competitive advantage. Companies demonstrating credible sustainability practices may strengthen investor confidence, improve stakeholder relationships, attract talent and enhance long-term resilience.

12. Recommendations:

The following measures may strengthen ESG regulation and implementation in India:

1. Greater alignment with ISSB

India should progressively align its sustainability reporting architecture with internationally recognised ISSB standards while retaining India-specific requirements where necessary.

2. Strengthening assurance mechanisms

Independent assurance or assessment of critical ESG metrics should be strengthened progressively to improve reliability.

3. Development of ESG data infrastructure

Companies should invest in integrated ESG information systems capable of collecting environmental, social and governance data across business units and supply chains.

4. Capacity building

SEBI, industry bodies, professional institutions and educational institutions should undertake training programmes for directors, finance professionals, auditors, sustainability officers and researchers.

5. Support for SMEs

A proportionate ESG framework should be developed for smaller enterprises so that compliance costs do not become disproportionately burdensome.

6. Stronger greenwashing controls

Companies and investment products making ESG claims should be required to provide measurable evidence supporting those claims.

7. Greater stakeholder engagement

ESG reporting should not become a purely investor-focused activity. Employees, customers, communities, suppliers and regulators are also important stakeholders.

Conclusion:

ESG regulation has entered a new phase in which sustainability is increasingly regarded as a component of corporate governance, financial risk management and capital-market transparency. India has made considerable progress through the

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BRSR framework, BRSR Core, ESG assurance and value-chain disclosures. These initiatives have helped move sustainability reporting from a largely voluntary activity towards a more structured regulatory process.

Internationally, the regulatory landscape remains diverse. The European Union has adopted an extensive sustainability reporting architecture through CSRD and ESRS, while the ISSB has developed IFRS S1 and IFRS S2 as a global baseline. The United Kingdom is moving towards ISSB-aligned sustainability reporting while simultaneously regulating sustainability claims in investment products through its SDR framework. The United States, in contrast, has experienced substantial uncertainty surrounding mandatory climate disclosure, with the SEC proposing in 2026 to rescind its 2024 climate disclosure rules.

The emerging regulatory environment suggests that the future of ESG reporting will be characterised by **greater standardisation, stronger assurance, enhanced supply-chain transparency, increasing attention to greenwashing and closer integration with financial decision-making**.

For India, the key challenge is to achieve a balance between global comparability and domestic relevance. Excessive regulatory complexity may increase compliance costs, whereas weak disclosure requirements may undermine investor confidence. A proportionate, transparent and internationally compatible ESG framework can enable Indian companies to meet global expectations while strengthening sustainable economic development.

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(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
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BALANCING ETHICAL PRIORITIES AND FINANCIAL PERFORMANCE: RESPONSIBLE INVESTING

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Abstract:
Responsible investing includes environmental, social, governance (ESG) factors along with traditional measures of return, risk, liquidity, and valuation. This study looks at whether ethical priorities lead to lower financial performance and explores practical ways to balance both goals. It combines existing evidence with a structured questionnaire answered by six participants. The findings show that responsible investing doesn't have to mean weaker long-term risk-adjusted results when ESG issues are financially important and assessed through careful portfolio analysis. Survey responses indicate strong support for ethical and governance factors, but participants are wary of giving up returns. A lack of awareness was identified as the main obstacle to broader adoption. The study concludes that clear ESG disclosures, investor education, diversification, and a long-term perspective are vital for balancing responsible goals with smart financial choices.

Keywords: *Responsible investing, ESG integration, ethical investing, corporate governance, sustainable finance, financial performance*.

Introduction:

Investment decisions have generally been based on expected returns, risk, liquidity, and market value. Today, investors care about how companies affect the

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environment, their employees, customers, and communities. They also want to know if these effects influence long-term value. Responsible investing involves environmental, social, and governance (ESG) factors in investment analysis, ownership practices, and building portfolios.

Environmental issues include climate exposure, resource use, pollution, and waste. Social issues include labour conditions, product responsibility, diversity, and human rights. Governance issues focus on board oversight, transparency, shareholder rights, and anti-corruption efforts. These factors can show an investor's values, but they can also affect financial performance. Regulatory penalties, supply-chain disruptions, governance failures, workplace conflicts, and reputational damage can all impact cash flows and risk.

The main question is not whether ethics and finance share the same goals, but whether they can be managed together. Excluding entire sectors might reduce diversification and lead to short-term deviations from a broad benchmark. On the flip side, integrating ESG factors could help find long-term risks and opportunities. This paper looks into that balance through existing literature and a small survey of investor opinions.

Beyond ethical and financial factors, the integration of ESG considerations is increasingly supported by technology and regulation. Developments in big data, artificial intelligence, and blockchain allow investors to access more reliable and detailed information on corporate practices. This includes data on carbon emissions, water usage, supply-chain transparency, and workforce diversity.

Literature Review:

1. Friede, Busch, and Bassen (2015) reviewed over 2,000 studies. Most of these studies found a positive relationship between ESG and corporate financial performance. Their review supports the notion that sustainability information can be important for financial analysis. However, it does not guarantee better returns in every period or market.
2. The CFA Institute Research Foundation (2022) states that evaluating ESG strategies needs careful thought about benchmark choice, factor exposures, active decisions, and attribution. It warns against assuming that a fund label alone shows sustainability quality or financial benefit.
3. The Principles for Responsible Investment (PRI, 2023) defines responsible investment as an approach that considers ESG factors in investment decisions and ownership. The framework emphasises that methods should reflect the investor's goals, mandate, and evidence of financial importance.

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4. Khan, Serafeim, and Yoon (2016) found that companies with strong performance on financially important sustainability issues outperformed those with weaker performance during their study period.
5. Gibson, Brandon, Krueger, and Schmidt (2021) show significant differences among ESG ratings. This inconsistency matters because investors may reach different conclusions about the same company based on the rating provider and methodology used.
6. IOSCO (2021) emphasises the need for consistent sustainability-related disclosure and investor protection. This relates to the survey finding that confidence in ESG information is crucial for broader acceptance.
7. Overall, the evidence does not support the simple claim that responsible investing always leads to better returns or always incurs a cost.
8. Morningstar (2020) reported that sustainable funds often showed resilience during market downturns. This suggests that ESG integration may help reduce downside risk, even if it does not guarantee outperformance in bull markets.
9. The World Economic Forum (2021) highlighted that investor demand for ESG products is rising. This trend is driven by generational shifts and regulatory pressure, indicating that ESG considerations are becoming part of mainstream capital allocation.
10. Harvard Business Review (2019) argued that ESG should not be viewed as a separate category. Instead, it should be part of a comprehensive risk management and value creation strategy. This reinforces the idea that ethics and finance can be managed together rather than seen as opposing goals.

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Research Methodology:

1. Primary and Secondary Data

Research data can be collected through primary data and secondary data.

Primary data is information gathered directly by the researcher for a specific purpose. It can be obtained through methods like questionnaires, surveys, interviews, focus groups, or observations. For instance, in a study on responsible investing, the researcher could collect primary data by surveying investors about their willingness to invest in ESG-focused companies.

Secondary data refers to information that has already been collected, analysed, and published by others. Examples include research papers, academic journals, books, annual reports, government publications, financial reports, industry reports, ESG reports, and data published by financial institutions.

This study on "Balancing Ethical Priorities and Financial Performance: Responsible Investing" mainly relies on secondary data. Secondary data is particularly useful because responsible investing looks at broad trends, financial performance, ESG practices, investment strategies, and how sustainability relates to returns over time.

The study will collect and analyse information from:

- Academic research papers and journals on responsible investing, ESG, and sustainable finance.
- Annual and sustainability/ESG reports from companies.
- Reports from financial institutions and investment organisations.

The collected secondary data will be analysed using a descriptive and comparative approach. The study will compare ethical considerations like environmental responsibility, social welfare, and corporate governance with financial factors such as profitability, risk, returns, and long-term performance.

2. Objectives of the Study

The main goal of this research is to explore how investors can balance ethical concerns with financial performance through responsible investing. The specific objectives are:

1. To understand the concept of responsible investing and its significance in modern financial markets.
2. To look at the role of ESG factors—Environmental, Social, and Governance—in investment decisions.
3. To analyse the link between responsible investing and financial performance, particularly in terms of returns, profitability, and risk.
4. To identify the key ethical considerations that impact responsible investment choices.

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5. To investigate whether responsible investing creates a trade-off between ethical priorities and financial returns or if both can be achieved together over the long term.
6. To study the increasing significance of sustainable and ESG-focused investments among investors and financial institutions.

3. Limitations of the Study

Despite using information from various reliable sources, the study has some limitations:

1. Dependence on secondary data: Since the research mainly relies on existing information, its accuracy depends on the quality and reliability of the sources used.
2. Limited access to information: Some detailed financial and ESG information may not be publicly available or may require access to paid databases.
3. Differences in ESG standards: Companies and organisations might use different methods and criteria to measure ESG performance, making direct comparisons tricky.
4. Possibility of reporting bias: Companies may portray their sustainability activities positively in their reports, affecting the objectivity of the available information.
5. Greenwashing: Some organisations might inflate their environmental or social performance, complicating efforts to gauge their actual impact.
6. Changing market conditions: Financial performance and investor preferences can shift due to economic changes, regulations, technological developments, and global event.

4. Stakeholder relationship

Stakeholder relationships are crucial in responsible investing because investment choices can impact many people and organisations, not just shareholders. Stakeholders are individuals or groups affected by, or able to influence, a company's activities. This includes employees, customers, investors, suppliers, government authorities, local communities, and the environment.

In responsible investing, companies should maintain clear, ethical, and beneficial relationships with their stakeholders. Solid stakeholder relationships can boost a company's reputation, build trust, lower conflicts, and support long-term financial success.

Importance of Stakeholder Relationships:

Effective stakeholder management supports responsible investing in several ways:

- Builds trust and transparency between companies and stakeholders.
- Reduces reputational and operational risks.

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- Improves employee satisfaction and productivity.
- Strengthens customer loyalty.
- Encourages ethical and sustainable business practices.
- Helps companies identify social and environmental risks.
- Supports long-term business growth and financial performance.

Key Findings:

Case Study:

Case Study: Tata Group

Tata Group is a good example of **responsible investing and ethical business practices**. The group focuses not only on financial growth but also on the welfare of employees, customers, communities, and the environment.

Tata invests in areas such as **education, healthcare, community development, environmental sustainability, and employee welfare**. At the same time, its businesses aim to maintain profitability and create long-term value for investors.

This shows that **ethical responsibilities and financial performance can exist together**. By maintaining good stakeholder relationships and following responsible business practices, companies can build trust, reduce risks, and support sustainable long-term growth.

Key takeaway: Responsible investing does not always mean sacrificing profits; ethical and sustainable practices can also contribute to **long-term financial performance and stakeholder value**.

Case Study 2: Unilever

Unilever is an example of a company that incorporates sustainability into its business strategy. It focuses on reducing environmental impact, responsible sourcing, and improving social conditions across its supply chain. These practices help strengthen its relationship with customers, employees, suppliers, and investors. The case shows how sustainability can support **brand reputation, risk management, and long-term business growth**.

Case Study 3: Infosys

Infosys focuses on corporate governance, employee development, community initiatives, and environmental sustainability. The company has invested in areas such as education, digital skills, renewable energy, and reducing its environmental footprint. Its approach demonstrates how responsible business practices can benefit **multiple stakeholders while supporting long-term financial and organisational performance**.

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Recommendations and Conclusion:

Recommendations:

1. Increase investor awareness with financial-literacy programs that explain ESG concepts, risk, return, and investment approaches.
2. Use ESG evidence with financial analysis, valuation, fees, and diversification. A sustainability label should not replace due diligence.
3. Encourage companies and asset managers to offer clear, comparable, and useful ESG disclosures.
4. Promote active ownership and engagement concerning important governance, environmental, and stakeholder risks.
5. Strengthen protections against greenwashing with clear methods, reporting standards, and regulatory oversight.
6. Adopt a long-term view because many ESG-related risks and benefits take time to develop.

Conclusion:

Responsible investing does not force investors to choose between ethics and financial performance. Evidence shows that ESG considerations can improve understanding of long-term risks and opportunities when they are financially significant and used consistently. However, responsible investing does not guarantee higher returns. Factors like implementation, diversification, valuation, sector exposure, and fees are crucial.

The main survey supports this balanced view. Respondents valued ethics, ESG practices, and governance, but their willingness to accept a potential return trade-off indicates that financial performance is still key. A credible responsible investing approach should include clear information, investor education, careful financial analysis, and a long-term perspective.

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(ISSN – 2581-5830)
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SOCIAL RESPONSIBILITY AND BUSINESS DIVERSITY IN ADVANCING ESG GOALS

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Abstract:
This paper examines how corporate social responsibility, workforce diversity and the Tata Group's diversified business portfolio contribute to environmental, social and governance (ESG) goals. The study adopts a descriptive and analytical multiple-case design based on secondary data, with FY 2024–25 treated as the principal reference period. Evidence is drawn from the Tata Sons annual report, Project Aalingana disclosures, integrated annual reports and Business Responsibility and Sustainability Reports (BRSR) of selected group companies, regulatory documents and peer-reviewed scholarship. The analysis covers group-level scale and governance, social investment, workforce representation and sector-specific ESG roles in technology, steel, automobiles, power and electronics. The findings show that the group's diversity of businesses can create ESG complementarity: renewable power can support low-carbon mobility and manufacturing; technology can enable measurement and efficiency; and industrial businesses can scale circularity and community programmes. Tata also reports substantial social reach and formal governance mechanisms. However, female representation varies sharply across disclosed workforce categories, beneficiary measures are not standardised, and a group-wide consolidated ESG data set is not publicly available. The paper concludes that Tata's legacy of social purpose has increasingly moved from philanthropy towards strategy, measurement and governance, while recommending harmonised group metrics, outcome-based CSR evaluation, stronger value-chain disclosure, independently assured transition plans and more ambitious, intersectional diversity targets.

Keywords: *Tata Group; corporate social responsibility; ESG; business diversification; workforce diversity; Project Aalingana; BRSR; sustainability*

Scope note: In this study, "diversity" has two connected meanings: diversity within the workforce and diversity across the Tata Group's portfolio of businesses. The paper does not treat one as a substitute for the other.

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(ISSN – 2581-5830)
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Introduction:

Corporate responsibility has moved from a predominantly philanthropic idea to a strategic and measurable part of business governance. Corporate social responsibility (CSR) traditionally describes the responsibilities and programmes through which firms respond to social needs, ethical expectations and community development. ESG, in contrast, provides an organising framework through which environmental impact, social performance and governance quality are measured, disclosed and evaluated by boards, regulators, investors, employees and other stakeholders. The two ideas overlap but are not identical: CSR expresses responsibility and action, while ESG increasingly demands targets, data, accountability and comparability (Gillan et al., 2021).

The Indian setting is particularly important because Section 135 of the Companies Act, 2013 established a statutory CSR framework for qualifying companies. Schedule VII recognises activities such as poverty reduction, health, education, gender equality, environmental sustainability and rural development. Listed companies also operate within the Business Responsibility and Sustainability Reporting framework of the Securities and Exchange Board of India (SEBI). BRSR and BRSR Core have shifted the discussion from how much a company spends to how responsibly it operates, what outcomes it creates and whether selected sustainability information is subject to assessment or assurance (Government of India, 2013; SEBI, 2023, 2025).

The Tata Group offers a distinctive case for studying this transition. Founded in 1868, the group combines a long history of philanthropy and community institution-building with a large, internationally diversified portfolio. Its FY 2024–25 disclosures describe operations across major sectors including technology, automotive, steel, consumer and retail, infrastructure and energy, financial services, aerospace and defence, tourism, telecom and trading. Tata Sons reported group-company revenue of US$180 billion, more than one million employees, activity in over 150 countries and 26 listed group companies with combined market capitalisation of US$328 billion as at 31 March 2025 (Tata Sons, 2025).

Business diversity makes the Tata case analytically valuable. A service company such as Tata Consultancy Services (TCS) has a very different environmental footprint and workforce profile from Tata Steel. Tata Motors can influence sustainable mobility through electric vehicles and product design, whereas Tata Power can expand renewable power and charging infrastructure. Tata Electronics adds a manufacturing and employment dimension. A common ESG policy applied across such different sectors must therefore combine group-wide direction with sector-specific materiality. This is consistent with Khan et al. (2016), who show that sustainability performance is most meaningful when it focuses on issues that are financially and operationally material to the relevant industry.

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Project Aalingana is the group's principal environmental sustainability platform. It articulates an aspiration of net-zero emissions across the group by 2045 and organises action around decarbonisation, circular economy and the preservation and restoration of nature. The programme is intended to embed sustainability within business strategy and to capture "One Tata" synergies across companies. The case therefore raises a central question: can diversification become an ESG capability rather than merely a source of organisational complexity?

1.1 Problem Statement

Tata companies disclose many ESG initiatives and achievements, but the evidence is dispersed across company-specific reports with different boundaries, metrics and levels of assurance. Public discussion often praises the group's social legacy without sufficiently distinguishing charitable expenditure, operational ESG performance, workforce inclusion and sector-specific sustainability strategy. A critical synthesis is therefore required to understand how social responsibility and both forms of diversity—business and workforce—contribute to ESG goals, where the contribution is measurable, and where gaps remain.

1. Objectives of the Study:

1. To examine the relationship between Tata's social-responsibility tradition and its contemporary ESG framework.
2. To analyse how the group's diversified business portfolio contributes to environmental and social goals across sectors.
3. To compare selected FY 2024–25 indicators relating to CSR reach, workforce diversity and ESG targets.
4. To identify governance, measurement and comparability gaps in the available disclosures.
5. To recommend measures for strengthening group-wide ESG performance, diversity and accountability.

2. Research Questions:

- How is social responsibility institutionalised within the Tata Group's ESG governance?
- How does business diversification create ESG synergies and risks across Tata companies?
- What do selected disclosures reveal about workforce diversity and social impact?
- Which improvements would make Tata's ESG reporting and outcomes more comparable and decision-useful?

Review of Literature:

The literature relevant to this paper may be organised into four themes: the evolution of CSR and stakeholder theory; ESG and corporate performance; diversity and governance; and the relationship between business diversification and sustainability.

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Together, these streams explain why a diversified group requires both a unifying responsibility framework and material, sector-level targets.

1. CSR, Stakeholders and Sustainability

Freeman's (1984) stakeholder approach challenged the view that corporations are accountable only to shareholders. It argued that sustainable strategic management requires attention to employees, customers, suppliers, communities, governments and financiers. Carroll (1991) subsequently presented CSR as a layered responsibility comprising economic, legal, ethical and philanthropic dimensions. Elkington's (1997) triple-bottom-line approach broadened performance evaluation to people, planet and profit. These frameworks remain useful for the Tata case because the group combines economic scale, legal CSR obligations, ethical commitments and philanthropic institutions.

Dyllick and Muff (2016) distinguished conventional business sustainability—where companies reduce negative impacts—from sustainability strategies that address societal challenges and create positive value. This distinction is central to the present study. CSR expenditure and beneficiary reach demonstrate activity, but stronger ESG performance also requires changes in products, production systems, supply chains and capital allocation.

2. ESG Materiality, Disclosure and Performance

Eccles, Ioannou and Serafeim (2014), using a matched sample of 180 United States companies, found that firms with long-standing sustainability policies exhibited stronger board responsibility, stakeholder engagement and non-financial measurement, and outperformed comparison firms over the long term. Friede, Busch and Bassen (2015) synthesised more than 2,000 empirical studies and found that most reported a non-negative relationship between ESG and corporate financial performance. Their work supports the business relevance of ESG, although it does not imply that every ESG initiative automatically produces superior returns.

Khan, Serafeim and Yoon (2016) made the critical distinction between material and immaterial sustainability issues. Firms with stronger performance on material sustainability topics experienced better future performance, whereas strength on immaterial topics did not produce the same result. Gillan, Koch and Starks (2021) reviewed the ESG and CSR literature in corporate finance and showed that the field involves multiple mechanisms, including risk, reputation, investor preference, governance and access to capital. Berg, Kölbel and Rigobon (2022) documented substantial disagreement among ESG ratings, warning that a single ESG label can conceal differences in scope, measurement and weighting.

Indian evidence also supports a contextual approach. Dalal and Thaker (2019) examined listed Indian companies and reported a positive relationship between

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ESG performance and selected measures of corporate performance. Maji and Lohia (2023), using CRISIL ESG scores for 222 Indian firms, found that governance and social parameters received more attention than environmental parameters and that ESG performance was positively associated with firm performance, although effects differed across the distribution. The result suggests that Indian companies cannot assume balanced performance across all three ESG pillars merely because aggregate ESG disclosure has improved.

3. Diversity, Governance and Reputation

Bear, Rahman and Post (2010) found that the number of women on corporate boards was associated with CSR ratings and that CSR helped mediate the relationship between board gender composition and corporate reputation. Post and Byron's (2015) meta-analysis concluded that the relationship between women on boards and financial performance depends partly on national and governance contexts. These studies caution against treating diversity as a symbolic count. Representation can improve deliberation, monitoring and stakeholder sensitivity when inclusion extends to influence, leadership pipelines and organisational processes.

4. Business Diversification and ESG

Diversification can provide resources, capabilities and risk-spreading benefits, but it can also produce complex structures and inconsistent controls. Barros, Verga Matos, Miranda Sarmento and Rino Vieira (2024) examined firms in the Euro Stoxx 50 and found that business-segment diversification was associated with ESG performance under particular portfolio structures, while geographical diversification alone did not explain ESG variability. Applied cautiously to Tata, this literature suggests that a broad portfolio can strengthen ESG when group companies share technology, infrastructure, governance systems and learning; it can weaken accountability when metrics and boundaries are fragmented.

Table 1. Selected literature and its relevance

Study	Focus / method	Principal insight	Relevance to this paper
Freeman (1984)	Stakeholder theory	Strategy should account for multiple	Explains Tata's community, employee

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Study	Focus / method	Principal insight	Relevance to this paper
		stakeholders, not only shareholders.	and value-chain orientation.
Carroll (1991)	CSR framework	Economic, legal, ethical and philanthropic responsibilities are interrelated.	Helps distinguish statutory CSR from broader responsibility.
Eccles et al. (2014)	Matched-sample empirical study	High-sustainability firms showed stronger governance and long-term performance.	Supports board-level integration and measurement.
Friede et al. (2015)	Meta-analysis of 2,000+ studies	Most studies reported a non-negative ESG–financial performance relation.	Establishes strategic relevance while avoiding causal overstatement.
Khan et al. (2016)	Industry materiality	Performance on material ESG issues mattered more than performance on immaterial issues.	Justifies sector-specific analysis within Tata.
Bear et al. (2010)	Board diversity and CSR	Women's board representation was linked with CSR and reputation.	Connects diversity, governance and social legitimacy.
Post & Byron (2015)	Meta-analysis	Effects of women on boards depend on governance and institutional context.	Warns against tokenistic interpretation of representation.
Dalal & Thaker (2019)	Panel study of Indian companies	ESG was associated with profitability and firm value measures.	Provides Indian-market evidence.

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Study	Focus / method	Principal insight	Relevance to this paper
Maji & Lohia (2023)	222 Indian firms; CRISIL ESG scores	ESG was positively associated with performance; pillars were uneven.	Reinforces the need for pillar-level analysis.
Barros et al. (2024)	Diversification and ESG	Business-segment structure was related to ESG performance.	Directly informs the 'business diversity' dimension.
Berg et al. (2022)	ESG-rating divergence	Ratings disagree because of scope, measurement and weighting differences.	Supports harmonised definitions and assurance.

Source: Author's synthesis of cited studies.

5. Research Gap

Existing research explains CSR, ESG materiality, gender diversity and diversification, but these themes are often studied separately. There is limited integrated analysis of how a large Indian business group uses a shared ESG framework across materially different sectors while also addressing workforce inclusion and statutory CSR. This paper fills that narrow gap through a multiple-case synthesis of the Tata Group. It does not attempt to estimate causal financial effects; instead, it evaluates alignment, reported evidence, comparability and strategic coherence.

Research Methodology:

1. Research Design

The study uses a descriptive and analytical multiple-case-study design. It is descriptive because it organises reported Tata ESG goals, CSR outputs and diversity indicators. It is analytical because it compares disclosures across sectors, interprets the strategic role of diversification and evaluates gaps using stakeholder, materiality and governance perspectives. The research is non-experimental and does not claim that Tata's ESG practices caused financial performance or social outcomes.

2. Unit of Analysis and Case Selection

The principal unit of analysis is the Tata Group, with Tata Sons serving as the group-level governance and disclosure reference. Purposive sub-cases were selected to represent materially different businesses: TCS (technology and services), Tata Steel (hard-to-abate manufacturing), Tata Motors (automotive and

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electric mobility), Tata Power (energy transition and infrastructure) and Tata Electronics (new manufacturing and employment). Quantitative comparison is restricted mainly to TCS, Tata Steel and Tata Motors because their FY 2024–25 disclosures provide identifiable workforce and social-reach measures. Tata Power and Tata Electronics are used primarily to analyse portfolio complementarity.

3. Sources and Reference Period

The principal reference period is the financial year 1 April 2024 to 31 March 2025. Sources include Tata Sons' Annual Report 2024–25; the Tata Group's Project Aalingana materials; TCS FY 2024–25 disclosures; Tata Steel's Integrated Report and BRSR 2024–25; Tata Motors' BRSR 2024–25; Tata Power's annual and BRSR disclosures; the Tata Code of Conduct; SEBI circulars; India Code materials on Section 135 and Schedule VII; United Nations SDG materials; and peer-reviewed studies. Sources available after FY 2024–25 were used only when they clarified a target or reporting framework and were not mixed into the FY 2024–25 comparative figures.

4. Variables and Analytical Framework

Table 2. Analytical dimensions and indicators

Dimension	Indicators examined	Interpretive purpose
Social responsibility	CSR expenditure, reported beneficiaries/lives reached, geographic coverage, volunteering and programme themes	Indicates scale of reported social action; not automatically equivalent to long-term impact.
Workforce diversity	Women as a share of employees/workers; board representation; nationalities; inclusion targets	Measures representation where disclosed; does not fully capture inclusion, pay equity or career progression.
Business diversity	Sector spread and complementary ESG roles across technology, steel, mobility, power and electronics	Evaluates whether portfolio breadth enables shared solutions and risk diversification.
Environmental alignment	Net-zero targets, renewable electricity, circularity, water, waste and nature goals	Assesses target architecture and sector materiality.

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Dimension	Indicators examined	Interpretive purpose
Governance	Tata Code of Conduct, board/committee oversight, BRSR, assurance and group sustainability mechanisms	Assesses accountability and quality of disclosed information.

Source: Author's research framework.

5. Techniques of Analysis

The paper uses document analysis, cross-case comparison, percentage comparison and thematic coding. Reported women's representation and beneficiary figures are displayed visually. Simple percentage-point differences are interpreted descriptively, not as performance rankings. ESG contributions are coded by material role: decarbonisation, circularity, nature, community development, inclusion and governance. All calculations are based on published figures and are labelled as author compilations.

6. Reliability, Validity and Ethical Safeguards

Triangulation is achieved by combining group-level, company-level, regulatory and academic sources. Priority is given to official annual reports, BRSR documents and peer-reviewed publications. The study distinguishes reported outputs from independently verified outcomes and avoids estimating undisclosed data. Company-reported figures are reproduced with their reporting boundaries where material. No personal data, human participants or confidential records are used.

7. Limitations

The study has five limitations. First, group companies use different reporting boundaries and definitions. Second, beneficiary counts may be cumulative, overlapping or measured using company-specific methodologies. Third, workforce categories differ between service and manufacturing businesses. Fourth, public disclosures primarily reflect management reporting and only selected indicators may be independently assured. Fifth, a single-year case study cannot establish trend, causality or the financial returns from ESG investment. These limitations are incorporated into the interpretation rather than treated as minor technical notes.

Data Analysis and Interpretation:

1. Scale and Diversity of the Tata Group

Table 3. Tata Group scale and business diversity

Indicator	FY 2024–25 disclosure	ESG interpretation
Countries of presence	More than 150	Creates broad stakeholder and regulatory exposure.

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Indicator	FY 2024–25 disclosure	ESG interpretation
Consumers served	Approximately 900 million	Raises product-responsibility and social-impact significance.
Group-company revenue	US$180 billion	Provides financial capacity for transition investment and social programmes.
Employees	More than one million	Makes workforce wellbeing, skills and inclusion materially important.
Listed group companies	26	Creates extensive disclosure, governance and investor-accountability obligations.
Combined market capitalisation	US$328 billion at 31 March 2025	Increases the relevance of credible ESG information to capital markets.
Major sectors	Technology, automotive, steel, consumer and retail, infrastructure and energy, financial services, aerospace and defence, tourism, telecom, trading	Enables cross-sector ESG solutions but complicates comparability.

Source: Compiled from Tata Sons Private Limited, Annual Report 2024–25.

The data show that ESG is material to Tata not only because of corporate reputation but because of scale. More than one million employees create substantial social responsibilities, while industrial and infrastructure businesses create material transition, resource and community risks. The presence of technology, power, automobiles and advanced manufacturing in one portfolio also permits shared solutions. For example, renewable power can support electric mobility and low-carbon factories, digital capabilities can improve measurement and asset efficiency, and battery manufacturing can support the group's mobility ecosystem.

The same diversity creates a governance challenge. An aggregate ESG statement can obscure sector-specific realities: emissions from steel cannot be assessed using the same operational benchmark as an IT services company. The correct group model is therefore a common direction with material company-level pathways, not a single undifferentiated score.

2. Project Aalingana and ESG Goal Architecture

Table 4. Selected Project Aalingana goals

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Pillar	Selected goal	Timeline	Interpretation
Decarbonisation	25% reduction in absolute Scope 1 and 2 emissions from a 2020 baseline, with a separate intensity pathway for Tata Steel India	2030	Interim target before the group net-zero ambition.
Decarbonisation	Net-zero emissions across the group; stated scope varies by company	2045	Creates a common long-term direction across sectors.
Circular economy	More than double renewable or recycled content in products over a 2020 baseline	2025	Links product design and procurement to resource circularity.
Water and waste	Replenish freshwater in India operations and achieve zero waste to landfill	2030	Moves beyond emissions to resource stewardship.
Water	Replenish more freshwater than consumed	2040	Expresses a net-positive water aspiration.
Nature	Action plans for net-positive impact, investment in nature-based solutions and leadership in the Indian NBS market	2024–2030	Adds biodiversity and ecosystem restoration to ESG strategy.

Source: Tata Group Project Aalingana disclosures (Tata Group, 2022).

Aalingana performs three governance functions. First, it converts the group's environmental philosophy into dated targets. Second, it provides a shared language for companies whose material issues differ. Third, it encourages group synergies rather than isolated projects. The framework is strategically sound, but target credibility ultimately depends on annual progress data, consistent boundary definitions, capital-expenditure alignment and assurance. Targets whose dates have passed should be accompanied by explicit achievement, shortfall and remediation disclosures.

3. Social Responsibility at Group Level

Tata Sons reported that Tata Group companies devoted US$1.06 billion to CSR programmes over the preceding five years. The report described this as the highest among Indian corporates and equivalent to approximately 6% of total private-sector CSR spending over the prior four years. Tata's CSR presence extended across all 36 states and union territories, with one-third of activity located in lower-income states such as Jharkhand and Odisha (Tata Sons, 2025). These figures indicate national scale and some geographic prioritisation of vulnerable regions.

The institutional structure also matters. Tata Trusts' philanthropic role predates statutory CSR, while group companies conduct company-specific programmes. The Tata Affirmative Action Programme focuses on Scheduled Castes, Scheduled Tribes, persons with disabilities and women from marginalised communities. This

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combination connects philanthropy, statutory CSR and inclusion. However, expenditure and reach are output measures. A stronger impact claim requires evidence of sustained outcomes—for example, learning improvement rather than enrolment alone, income change rather than training participation, or reduced disease incidence rather than the number of people contacted.

4. Comparative CSR and Diversity Indicators

Table 5. Selected FY 2024–25 CSR and diversity disclosures

Company	Reported CSR spend	Reported social reach	Selected diversity indicator	Additional ESG evidence
TCS	₹1,038 crore	14.8 million beneficiaries	607,979 employees; 35.2% women; 152 nationalities	146,000+ volunteers and 8.9 million volunteering hours
Tata Steel	₹585 crore	5.77 million lives impacted	76,000+ employees; 10% women; 17% workforce diversity	₹5,700+ crore capital spend on ESG matters; net zero by 2045
Tata Motors*	Not used for cross-company comparison	1,488,301 beneficiaries	12,956 employees, 10% women; 45,486 workers, 11% women	TML Board: 3 of 9 women; CV net zero by 2045; 100% renewable electricity by 2030

*Source: TCS FY 2024–25 disclosures; Tata Steel Integrated Report 2024–25; Tata Motors BRSR 2024–25. *Tata Motors data combine TML, TMPVL and TPEML where stated.*

TCS reported the highest women's representation among the three comparable companies at 35.2%. Tata Steel reported 10% women in its workforce and a broader diversity mix of 17%. Tata Motors' combined disclosure reported women at approximately 10% of employees and 11% of workers. These differences are consistent with sectoral labour-market and job-design conditions, but they also show where targeted recruitment, safe infrastructure, technical training and leadership development remain most necessary.

Figure 1. Selected workforce gender indicators

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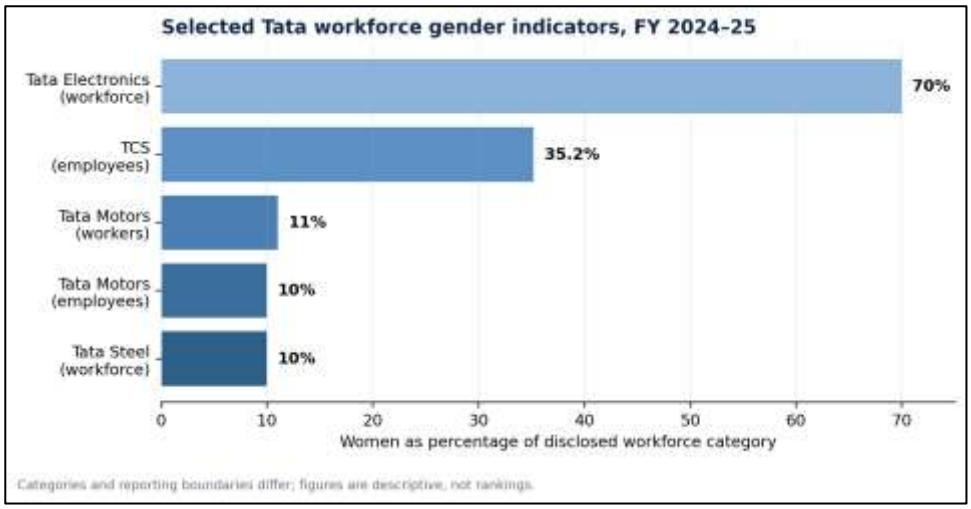
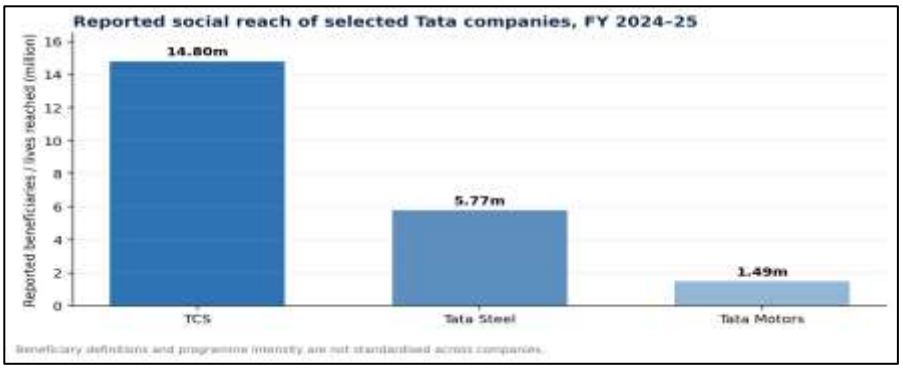


Source: Author's chart based on Tata Sons, TCS, Tata Steel and Tata Motors FY 2024–25 disclosures. Reporting categories differ.

Tata Electronics is an important portfolio-level example: Tata Sons reported more than 65,000 workers, approximately 70% of whom were women. This demonstrates that manufacturing need not be structurally associated with low female representation. Nevertheless, the figure relates to a particular workforce model and cannot be transferred mechanically to long-established steel or automotive operations. The analytical value lies in identifying practices—location strategy, recruitment channels, facilities, shift design, transport, safety and career pathways—that may be adaptable across companies.

Board representation is also relevant. Tata Motors Limited reported three women among nine directors, or 33.33%, while its combined employee and worker data showed much lower female shares. This gap illustrates why board diversity and workforce diversity should be tracked separately. Representation at the top may strengthen oversight and signalling, but a sustainable pipeline requires progress across technical, supervisory and leadership roles.

Figure 2. Reported social reach of selected companies



Source: Author's chart based on company FY 2024–25 disclosures. Figures are not measures of impact efficiency.

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The social-reach chart is descriptive. TCS reported 14.8 million beneficiaries, Tata Steel 5.77 million lives impacted and Tata Motors approximately 1.49 million beneficiaries. The values should not be used to rank efficiency because programme intensity, duration, beneficiary definitions and counting methods differ. A healthcare awareness contact, a multi-year livelihood participant and a student receiving sustained support may each count as one beneficiary but represent different depth of engagement.

5. Business Diversity as an ESG Capability

Table 6. Cross-sector ESG roles within the Tata portfolio

Business	Distinct ESG contribution	Strategic interpretation
TCS – technology	Digital systems, analytics, cloud optimisation and skills	Can reduce operational resource use, enable client decarbonisation and scale education; service-sector footprint still includes electricity, travel and data infrastructure.
Tata Steel – steel	Low-emission steel, scrap recycling, water and community development	Addresses a hard-to-abate sector where transition technology, capital and just-transition planning are material.
Tata Motors – mobility	Electric vehicles, renewable electricity, circular design and accessible mobility	Connects product innovation with national transport decarbonisation and consumer adoption.
Tata Power – energy	Renewable generation, rooftop solar and EV charging	Provides enabling infrastructure for lower-carbon operations across the group and economy.
Tata Electronics / Agratas	Electronics manufacturing, batteries and women's employment	Supports domestic clean-technology supply chains while creating manufacturing employment; requires responsible sourcing and lifecycle management.

Source: Author's thematic analysis of Tata Group and company disclosures.

The table demonstrates that business diversity can be productive when the companies' capabilities are connected. Tata Power's renewable expansion and charging network can support Tata Motors' electric-mobility strategy. TCS can

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provide digital platforms and analytics for asset efficiency, emissions data and customer services. Tata Steel can supply lower-emission materials and expand recycling. Agratas can localise battery capacity. This is a portfolio-level form of ESG advantage: one company's output becomes another company's transition input.

The advantage is conditional. Group synergies can become related-party complexity, duplicated claims or boundary ambiguity unless commercial terms, lifecycle emissions and accountability are transparent. For example, the same EV-charging activity should not be counted repeatedly as a separate group impact without clear attribution. Similarly, a shift to electric products is only as sustainable as the electricity mix, battery sourcing, recycling and affordability of the full system.

6. Governance and Disclosure

Governance provides the mechanism through which social purpose becomes consistent behaviour. The Tata Code of Conduct acts as an ethical roadmap across group companies, covering integrity, equal opportunity, human rights, responsible advocacy and environmental responsibility. Tata Sons also identifies the Tata Business Excellence Model, the Tata Sustainability Policy, the Tata Sustainability Group and the Tata Affirmative Action Programme as group-level mechanisms. At listed-company level, BRSR disclosure and assurance requirements introduce a regulatory layer.

This architecture is a strength because it links culture, policy, board oversight and public reporting. The principal gap is consolidation. Investors and other stakeholders can access detailed company reports, yet a harmonised group dashboard showing common definitions, base years, progress, assurance level and performance against each Aalingana target would materially improve transparency. The need is not for a single simplistic ESG score but for a coherent set of comparable core indicators supplemented by material sector metrics.

7. Overall Interpretation

Central interpretation: Tata's diversified portfolio is potentially an ESG ecosystem: power, digital technology, materials, mobility and manufacturing can reinforce one another. The value of that ecosystem depends on harmonised measurement, material sector pathways and evidence of outcomes—not on the number of initiatives alone.

Findings:

1. Social purpose is structurally embedded

Tata's social responsibility is supported by a long philanthropic history, Tata Trusts, group policies, the Tata Code of Conduct and company-level CSR. It is therefore more institutionalised than an annual expenditure exercise.

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2. Business diversity creates ESG complementarity

The presence of power, technology, steel, automobiles, batteries and electronics enables group companies to supply critical inputs to one another's transition strategies. Diversification can therefore function as an ESG capability.

3. Aalingana provides a common environmental direction

The group aspiration of net zero by 2045 and the pillars of decarbonisation, circularity and nature provide coherence across businesses. The strength of the framework lies in shared direction combined with sector-specific implementation.

4. Reported social investment and reach are substantial

Tata Sons reported US$1.06 billion of CSR expenditure over five years and pan-India presence. TCS, Tata Steel and Tata Motors reported large beneficiary numbers in FY 2024–25. These indicate scale, although not necessarily depth or long-term outcome.

5.Workforce diversity is uneven

Women constituted 35.2% of TCS employees and approximately 70% of the Tata Electronics workforce, compared with around 10% in Tata Steel and Tata Motors employee categories. Sector conditions matter, but the gap shows that inclusion requires targeted operational action.

6. Governance mechanisms are extensive

Tata combines culture-based governance with codes, policies, group forums, board committees, BRSR disclosure and selected assurance. This supports accountability but does not eliminate the need for consistent group-level metrics.

7. Comparability remains limited

Company boundaries, workforce categories, beneficiary definitions and ESG measures differ. The absence of a consolidated group data book restricts cross-company and time-series analysis.

8. Outputs are disclosed more readily than outcomes

Expenditure, participation and beneficiary reach are visible, while counterfactual evidence, sustained outcomes and social return on investment are less consistently available. This limits claims about impact.

Suggestions and Recommendations:

1. Publish a consolidated Tata ESG data book

Tata Sons should publish a group-wide annual dashboard with common definitions, reporting boundaries, base years, prior-year comparatives, target status and assurance levels. It should include both group totals and company-specific material indicators.

2. Report progress against every dated Aalingana target

For targets due in 2024, 2025 and subsequent years, disclosures should state achieved, partially achieved or not achieved, explain variance and specify

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corrective action. This would convert aspiration into accountable transition management.

3. Strengthen outcome-based CSR evaluation

Major programmes should report baseline, intervention intensity, outcome indicators and follow-up periods. Independent impact assessments and social-return analysis should be used selectively for large or long-running programmes. Unique beneficiaries should be separated from cumulative contacts to prevent double counting.

4. Set sector-specific and group-wide diversity pathways

Group companies should disclose annual targets for women in technical roles, middle management and leadership, together with retention, promotion and pay-equity indicators. Disclosures should also cover persons with disabilities, LGBTQIA+ inclusion and socio-economic diversity where legally and ethically appropriate.

5. Transfer inclusion practices across companies

Tata Electronics' high women's participation and Tata Steel's all-women mining and firefighting initiatives should be studied through a formal group learning mechanism. Adaptable practices may include safe transport, facilities, shift design, apprenticeship pipelines, role redesign and manager accountability.

6. Link transition plans to capital allocation

Net-zero commitments should be supported by technology pathways, capital-expenditure plans, milestones for Scope 1, 2 and material Scope 3 emissions, expected abatement and scenario analysis. Hard-to-abate businesses should disclose just-transition implications for workers and communities.

7. Expand value-chain ESG management

Supplier codes should be supported by training, risk-based due diligence, grievance mechanisms and measurable improvements. Small and medium suppliers should receive technical support so compliance requirements do not merely shift costs down the chain.

8. Increase independent assurance

Assurance should expand progressively beyond mandatory BRSR Core metrics to cover significant group claims, beneficiary methodologies, transition milestones and selected Scope 3 data. Assurance scope and level should be stated prominently.

9. Tie executive incentives to material ESG outcomes

A transparent portion of variable remuneration should be linked to independently verifiable, sector-material indicators such as emissions intensity, safety, leadership diversity, customer responsibility and community outcomes. Targets should discourage short-term gaming.

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10. Measure One Tata synergies without double counting

Cross-company projects in electric mobility, renewable power, batteries and digital systems should disclose the contribution of each entity and lifecycle impacts. A common attribution protocol would prevent the same outcome from being claimed by multiple companies.

Conclusion:

The Tata Group illustrates the evolution of corporate responsibility from philanthropy and community welfare towards an integrated ESG model. Its social legacy, ethical code, governance institutions and large CSR footprint provide a strong foundation. Project Aalingana adds strategic direction through decarbonisation, circular economy and nature goals, while BRSR and assurance requirements strengthen measurement and accountability.

The group's diversified business portfolio is not merely a background characteristic. It can become a practical ESG ecosystem in which renewable power supports mobility and manufacturing, technology enables efficiency and measurement, steel and automotive companies scale circularity, and new manufacturing creates inclusive employment. Yet diversity also increases complexity. Material issues, reporting boundaries and workforce structures differ widely, and group-wide conclusions cannot be drawn responsibly from isolated success stories.

The evidence therefore supports a balanced conclusion. Tata demonstrates substantial commitment, scale and institutional capability, but the next stage of ESG leadership requires comparable group data, independently verified transition progress, outcome-based social measurement and deeper inclusion across technical and leadership roles. Social responsibility will contribute most effectively to ESG goals when values are translated into measurable results, sector-specific strategy and transparent accountability.

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(ISSN – 2581-5830)
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BEYOND THE BUS STOP: DIAGNOSING INFRASTRUCTURE AND INFORMATION GAPS IN VADODARA'S PUBLIC BUS TRANSIT SYSTEM

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Abstract:
This paper investigates how infrastructural inadequacies and information gaps shape everyday bus commuting in Vadodara, a Tier-2 Indian city underexamined in existing transit literature. Drawing on a structured survey of 79 Vadodara bus commuters, the study documents commuter pain points across stop infrastructure, waiting times, information access, and safety and examines two prototype interventions of a multilingual digital kiosk and an in-bus LED navigation system developed on the basis of this commuter feedback. Results show that while physical infrastructure is rated poorly overall, commuters consistently prioritise informational and payment-related upgrades over physical shelter improvements, suggesting low-cost, information-first interventions may offer greater value than infrastructure investment alone in resource-constrained Tier-2 cities.
Keywords: *public bus transit; commuter service quality; Vadodara; information accessibility; user-centered design*

Introduction:

Vadodara's public bus transit system is a critical yet underexamined node in India's urban transportation network, where physical infrastructure and information accessibility significantly shape commuter experience. As one of Gujarat's largest urban centres, Vadodara depends heavily on its municipal bus network for affordable daily mobility, particularly among students, daily-wage workers, and residents without private vehicles. Despite established regulatory standards governing bus-stop design and service delivery, commuters continue to encounter unpredictable schedules, inconsistent information, and variable infrastructure quality across the city's routes. Understanding these everyday realities, and how far they diverge from formal policy and design standards, is essential to improving the reliability and accessibility of public transit in Tier-2 Indian cities such as Vadodara.

Review of Literature:

Badami and Haider (2007) analysed the financial and operational performance of public bus transit across eight major Indian cities, finding persistent losses and declining productivity through the 1990s. Their study established that service

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viability and service quality are structurally linked, a finding that continues to frame later research on India's bus transit sector.

Cheranchery and Maitra (2018) examined commuter perceptions of ordinary and premium bus services in Kolkata, finding that waiting time, security, and information access were the attributes riders weighed most heavily. Their study also showed captive and choice riders evaluate identical infrastructure differently, suggesting service standards should account for rider type.

Sogbe, Susilawati, and Pin (2024) conducted a systematic review of 104 global studies on bus service quality in developing countries since 2000, finding safety, reliability, comfort, and accessibility to be the dominant determinants of usage and satisfaction. The review also found this literature overwhelmingly perceptual and quantitative, with design-response studies remaining rare, a gap this paper addresses.

Objectives:

- To identify the major infrastructural and informational gaps in Vadodara's public bus transit system.
- To determine commuter priorities among proposed service and technology upgrades.
- To examine whether information-accessibility gaps differ significantly by commuter type.

Research Methodology:

Problem Statement: Vadodara's bus network has baseline infrastructure and defined operational policy, yet commuter accounts point to persistent gaps in reliability and real-time information that remain undocumented in transit research focused on Indian megacities and rural regions. This study examines whether commuter dissatisfaction in a Tier-2 city like Vadodara stems more from physical infrastructure deficits or from informational inaccessibility, and whether design interventions grounded directly in commuter feedback can meaningfully address the more significant of the two.

This study adopted a descriptive, mixed-methods research design combining a structured quantitative survey with a qualitative, feedback-informed prototyping phase. The universe of the study comprised the bus-using public of Vadodara city, with the individual commuter as the sampling unit. A non-probability convenience sampling technique was used, as the questionnaire was distributed online and completed voluntarily by self-selected respondents. Of 82 total responses received, 3 were exact duplicate entries removed during data cleaning, yielding an effective sample size of N = 79.

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Methods of Data Collection:

Primary Data:

Primary data were collected directly from Vadodara bus commuters through a structured, anonymous, six-section questionnaire administered via Google Forms and designed specifically for this study, covering demographic profile, travel behaviour, infrastructure and service-experience ratings on a five-point Likert scale, and ranked upgrade priorities.

Secondary Data:

Secondary data were drawn from peer-reviewed journal articles, government policy documents, and published technical engineering standards relevant to Indian urban public transit and bus-stop infrastructure design, used to contextualise and frame the primary findings of this study.

Hypothesis and Hypothesis Testing:

H0: There is no significant association between being a tourist-sightseeing respondent and citing the lack of language translation as the hardest-to-access information.

H1: Tourist-sightseeing respondents are significantly more likely than other respondents to cite this gap.

A chi-square test of independence was conducted and found a statistically significant association ($\chi^2 = 11.96$, $p = 0.0005$, Cramér's $V = 0.39$): 63.2% of tourist-sightseeing respondents cited the lack of language translation as their hardest-to-access information, compared to 18.3% of all other respondents (odds ratio = 7.6). The null hypothesis is therefore rejected, indicating that respondent type significantly influences the specific information barrier experienced.

Results and Analysis:

In relation to Objective 1, all five infrastructure statements scored below the survey's neutral midpoint, with a majority of respondents disagreeing on every dimension; route maps and timing displays fared worst (M = 2.41/5), followed by well-lit/safety perception (M = 2.47) and predictable arrivals (M = 2.48). Unpredictable delays (67%) and overcrowding (60%) were the most-cited pain points, and a majority of respondents rely on informal, person-dependent channels — asking the conductor (52%) or fellow passengers (43%) — over official information sources, with 58% naming real-time bus tracking as the single hardest piece of information to access.

In relation to Objective 2, this information gap directly shaped how respondents prioritised proposed upgrades: 72% ranked smart digital screens with live timings as their first priority, and an identical 72% ranked digital tap-and-go ticketing first, both well ahead of physical shelter upgrades, which 42% ranked lowest of the three options. Objective 3 is addressed directly by the hypothesis test above, which

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confirms that the specific information barrier experienced varies significantly by commuter type.

Major Findings:

- Infrastructure was rated poorly across all five dimensions assessed, with route information and timing displays the weakest.
- Unpredictable delays and overcrowding are the two most significant commuter pain points.
- Most commuters depend on informal, person-dependent information sources rather than official channels.
- Commuters prioritise informational and payment-technology upgrades (live tracking, digital ticketing) far above physical shelter improvements.
- Tourist-sightseeing respondents face a significantly greater language-access barrier than other commuter types ($p = 0.0005$).

Suggestions:

- Prioritise real-time, live bus-tracking information at high-footfall stops, the most-cited missing information (58%) and top-ranked upgrade priority.
- Introduce digital tap-and-go ticketing to reduce payment friction, given its equal top-priority ranking alongside live tracking.
- Provide multilingual (English/Hindi/Gujarati) signage at stops frequented by tourists, given the significant language-access barrier identified.
- Address unpredictable delays through improved schedule adherence and driver/conductor communication, the single most-cited pain point (67%).
- Treat physical shelter upgrades as a secondary investment, since commuters consistently ranked them below informational and payment-related improvements.

Conclusion:

This study examined the infrastructural and informational gaps in Vadodara's public bus transit system, commuter priorities for improvement, and whether these experiences differ by commuter type. The findings confirm that while physical infrastructure is rated poorly overall, the more urgent and consistently cited gap is informational, a pattern reflected directly in the in-bus LED display and digital kiosk prototypes developed from this feedback. Given the sample's self-selected, digitally-accessed nature, these findings should be validated through a larger, intercept-sampled study before being generalised further.

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(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
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UNDERSTANDING RESPONSIBLE INVESTMENT DECISIONS: ENTREPRENEURSHIP FOR SUSTAINABLE ECONOMY: WHERE PROFIT MEETS PURPOSE

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Abstract:
Sustainable entrepreneurship redefines how businesses balance profit with purpose, embedding social and environmental value into core strategy rather than pursuing profit alone. Drawing on secondary data — Shark Tank India cases, company reports, and academic literature — this paper examines how sustainability focused start-ups pitch, fund, and scale relative to conventional ventures, and the funding patterns and investor expectations shaping this shift. Findings highlight the practical viability of purpose-driven business models in a competitive, profit-oriented market.
Keywords: *Sustainable entrepreneurship, Shark Tank India, triple bottom line, purpose-driven business, startup funding.*

Introduction:

Sustainable entrepreneurship builds businesses that generate profit while addressing environmental and social challenges (Miring'u, 2023), measuring success through the triple bottom line — economic, ecological, and social value — rather than revenue alone. SDGs and ESG frameworks now guide businesses navigating climate change and globalization (Benavides-Sánchez et al., 2025), though balancing profitability with genuine impact remains a persistent challenge.

Unlike traditional entrepreneurship's focus on financial growth, this approach creates value for customers, communities, and the planet alongside economic success, making it an important driver of innovation amid climate pressures and shifting consumer expectations.

For students and practitioners in entrepreneurship, sustainability, consulting, and strategy, it offers insight into how businesses balance growth with responsibility.

1.Traditional versus Sustainable Entrepreneurship

At their core, both traditional and sustainable entrepreneurs identify opportunities, develop solutions, and create value through business ventures (Rosário et al., 2022). The key difference lies in how success is defined. Traditional entrepreneurship often prioritizes revenue growth, market share, and profitability. Sustainable entrepreneurship incorporates those goals while also weighing environmental and social outcomes. A sustainable entrepreneur is typically guided by a distinct set of questions:

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- How does this business affect communities?
- Can this product reduce waste or resource consumption?
- What long-term impact will this venture create?
- How can profitability and sustainability reinforce one another?

Rather than treating sustainability as an afterthought, sustainable entrepreneurs integrate it into the business model from the beginning. Figure 1 illustrates this conceptually: sustainable entrepreneurship sits at the intersection of economic, social, and environmental value, rather than treating any one dimension in isolation.

2. Objectives of the Study:

- To understand the concept of sustainable entrepreneurship and how it differs from traditional, profit-first business models.
- To examine how Indian startups featured on Shark Tank India — such as CoolAnt, Digital Paani, Revamp Moto, and India Hemp and Co — integrate environmental and social value into their business models.
- To analyse funding patterns, equity asks, and investor responses to sustainability-driven pitches compared with conventional business pitches.
- To explore select international examples, such as Innocent Drinks, Mukuru Clean Stoves, and Green & Black's, as reference points for how
- Purpose-driven ventures scale globally.
- To assess whether sustainable entrepreneurship is commercially viable within a competitive, profit oriented market, and to identify the current business conditions supporting this shift.

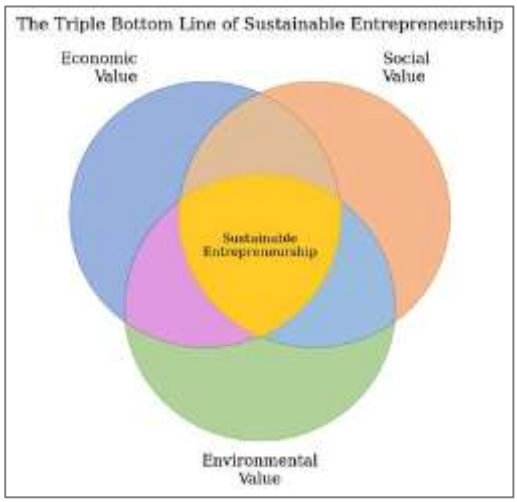

Figure 1. The triple bottom line of sustainable

Literature Review:

- Gu and Zheng (2021) used panel regression on Chinese polluting enterprises and found an N-shaped environmental Kuznets curve, whereby entrepreneurship directly increases pollution but reduces it indirectly through technology adoption and regulation. This finding suggests that entrepreneurship's environmental impact can shift from harmful to beneficial depending on context.
- Miring'u (2023) conducted a thematic review of 251 Scopus-indexed documents on sustainable entrepreneurship and the SDGs, showing how it advances goals like gender equality, poverty reduction, and climate action, while calling for more

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empirical, context-specific research. This frames sustainable entrepreneurship as a pathway to broader development, not just a business strategy.

- Esteves et al. (2021) show that community-led initiatives and the social solidarity economy — through "commons ecologies" — offer an alternative to conventional business that better addresses social and environmental crises, and that grassroots successes can strengthen SDG implementation via international networks. This highlights that community-rooted ventures, not just individual start-ups, matter for development goals.
- Abbas and Bulut (2024) reviewed 234 documents (2005–2024) and found sustainable entrepreneurship research growing but fragmented, with little consensus on measurement or definitions. Ike (2025) similarly found the field theoretically unsettled, calling for clearer boundaries with adjacent concepts like social and green entrepreneurship.
- Bonfanti et al. (2024) note that sustainable and social entrepreneurship overlap in valuing non-financial outcomes, but differ in scope — social entrepreneurship targets a specific need, while sustainable entrepreneurship integrates environmental, social, and economic value more broadly.
- Kaushik and Dangwal (2025) conducted a bibliometric analysis (2002–2021) confirming accelerating scholarly interest, especially in journals like Journal of Business Venturing and Business Strategy and the Environment. Rosário et al. (2022) similarly found most high-quality publications appear in Q1 journals, reflecting the field's growing legitimacy.

Collectively, this literature situates the present study's case-based approach within a wider body of research linking entrepreneurial activity to environmental and social outcomes. It also confirms two recurring gaps that this paper addresses: first, a continued reliance on bibliometric and conceptual reviews rather than grounded case analysis; and second, limited attention to how sustainability-driven pitches are actually evaluated by investors in fast-growing emerging markets such as India — a gap this paper addresses through its focus on Shark Tank India cases.

Research Methodology:

This study adopts a qualitative, descriptive research design based on case study analysis of secondary data. Since the objective is to explore patterns and relationships in sustainable entrepreneurship rather than to statistically test variables, a qualitative approach is best suited to capture the depth, context, and nuance of individual business cases. Data was collected entirely through secondary sources, including pitch details and outcomes from Shark Tank India episodes, official company websites, business news articles, press releases, and existing academic literature on sustainable entrepreneurship. No primary data collection, such as surveys or interviews, was undertaken, given the scope and time constraints of the

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study. Cases were purposively selected — chosen deliberately rather than randomly — based on their clear alignment with sustainability principles, the availability of sufficient public information, and their relevance to both the Indian startup ecosystem and global sustainable business practices.

1. Key Aspects of the Research Methodology

- Research design: Qualitative, descriptive, and exploratory
- Data type: Secondary data (no primary surveys or interviews conducted)
- Data sources: Shark Tank India episodes/pitches, official company websites, news articles, press releases, academic journals
- Sampling method: Purposive (non-random) sampling of ventures with an explicit sustainability focus
- Cases selected (India): CoolAnt, Digital Paani, Revamp Moto, India Hemp and Co
- Cases selected (International): Innocent Drinks, Mukuru Clean Stoves, Green & Black's
- Parameters of analysis: Funding ask, equity offered, deal outcome, business model, sustainability impact, and available revenue/growth figures
- Scope: Limited to publicly available information; findings are exploratory, not statistically generalizable

Case Analysis of Sustainable Ventures:

This section presents the individual cases examined in this study, selected according to the sampling method outlined above. It first profiles four Indian ventures featured on Shark Tank India, followed by three international ventures included as reference points for how purpose-driven models scale globally over the longer term.

1. Indian Ventures Featured on Shark Tank India

The following Indian ventures illustrate how environment-friendly start-ups combine business potential with positive impact.

CoolAnt: Founded in 2015 by Siripurapu Monish Kumar, Coolant addresses AC/refrigeration's ~16% share of global emissions with a terracotta passive-cooling system using shading, ventilation, and evaporative cooling to cut AC load by 30–70%. Despite the innovation, it didn't secure a deal for its ₹90 lakh/1% ask, being too early-stage.

Digital Paani: Founded in 2020 by Mansi and Rajesh Jain, Digital Paani tackles India's water crisis (600 million people lack reliable clean water) via an IoT platform monitoring wastewater plants and alerting operators through WhatsApp

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— relevant since 70% of India's 90,000 treatment plants malfunction. Revenue was ₹2 crore (FY23) with projections of ₹8 crore by FY25, yet the founders' ₹70 lakh/1% ask went undealt. **Revamp Moto:** Founded by Jayesh Tope and Pushkaraj Salunke, Revamp Moto built India's first modular EV utility platform (Revamp Mitr, RM25) — 140 km range, 65 kmph, 200 kg capacity, with a convertible back seat for vendor, delivery, or cold-storage use. Backed by a ₹250 crore order for 50,000 units, it secured ₹1 crore for 1.5% from Aman Gupta and Anupam Mittal, up from its original 1% ask.

India Hemp and Co: Founded in 2019 by sisters Shalini and Jayanti Bhattacharya in Bengaluru, the start-up makes food products from hemp seeds, promoting their high protein and fibre content despite the crop's misperception as non-food. Its twelve-category line includes pet food, trail mix, protein powder, and hemp seed oil, with ₹20 lakh in FY21 revenue. Despite this niche and traction, it left the show without a deal.

2. International Ventures

Beyond the Indian start-up ecosystem, several international ventures illustrate how purpose-driven models can scale globally over the long term.

Innocent Drinks: Richard Reed and Jon Wright built Europe's leading smoothie brand from a market stall around ethical and environmental values, pioneering recycled plastic bottles and local sourcing. They continue backing eco-conscious start-ups via Jam Jar Investments and extend their influence through The Innocent Foundation.

Mukuru Clean Stoves: Charlot Magayi, drawing on her experience in a Nairobi slum, founded a biomassbased stove that cuts pollution from traditional cooking. She won the 2022 Earthshot Prize and continues advocating for cleaner cooking solutions.

Green & Black's: Craig Sams co-founded the world's first Fair Trade-certified organic chocolate brand, later launching further ethical ventures like Carbon Gold and Judges Bakery, and remains a vocal advocate for sustainability in food.

3. The Growing Momentum of Sustainable Entrepreneurship

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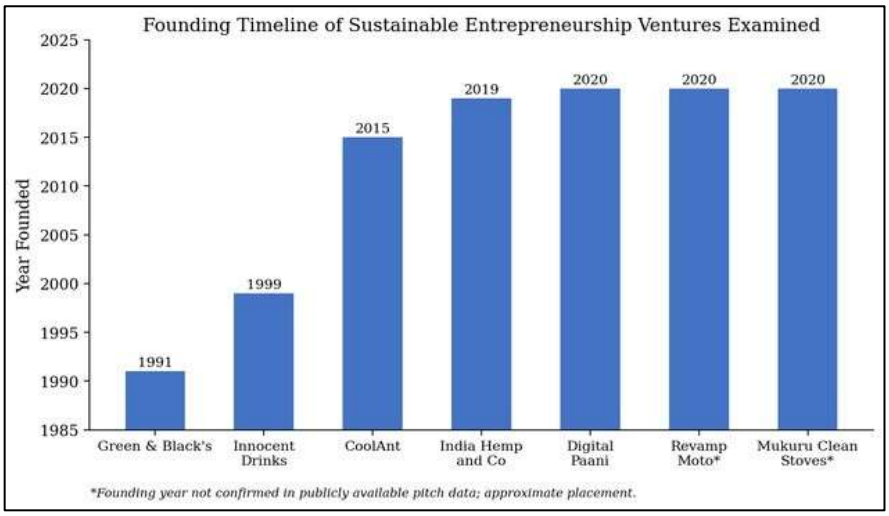

Figure 2. Founding timeline of sustainable entrepreneurship ventures examined in this study.

To understand the growth pattern of sustainable entrepreneurship, the founding years of the cases profiled above were mapped, as shown in Figure 2. While pioneers such as Green & Black's (1991) and Innocent Drinks (1999) laid early groundwork for sustainability-driven business, the majority of the Indian ventures examined in this study — including Digital Paani, India Hemp and Co, and Revamp Moto — were founded between 2019 and 2020, with Mukuru Clean Stoves following a similar timeline internationally. This clustering suggests that sustainable entrepreneurship has gained significant momentum only in the last five to six years, likely driven by rising environmental awareness, supportive policy shifts, and growing consumer demand for purpose-driven brands.

Findings and Discussion:

The case analysis reveals several key patterns in sustainable entrepreneurship. Among the Indian Shark Tank start-ups examined — CoolAnt, Digital Paani, and Revamp Moto — sustainability-focused pitches clearly attract investor attention, yet investors remain cautious about early-stage scalability, as reflected in the "no deal" outcomes for CoolAnt and Digital Paani. By contrast, Revamp Moto's success in securing funding suggests that combining clear, demonstrated commercial demand with sustainability messaging materially improves funding chances, indicating that investors respond favourably when purpose-driven ventures can also show a proven revenue pathway. Figure 3 and Table 1 summarise the funding and growth outcomes across all cases examined.

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The founding timeline further shows that most of the ventures examined emerged after 2019, reflecting a recent surge rather than a long established trend, and aligning with rising consumer demand for sustainable products in markets such as India (Kaushik & Dangwal, 2025). International cases like Innocent Drinks and Green & Black's, both founded well before this recent surge, show that sustainability-driven models can achieve long-term commercial success when embedded into the business model from the start — reinforcing that purpose and profit are not inherently in conflict, even if Indian investors currently treat early-stage sustainability ventures with more caution than their commercially proven international counterparts (Bonfanti et al., 2024).

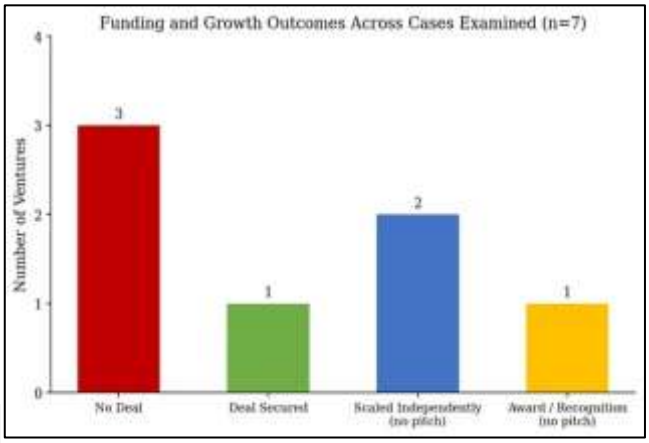

Figure 3. Funding and growth outcomes across the seven cases examined

Taken together, these findings suggest that sustainable entrepreneurship in India is still in a comparatively early, proof-of-concept phase relative to more established international examples, and that investor confidence tends to follow demonstrated commercial traction rather than sustainability credentials alone. This is broadly consistent with Abbas and Bulut's (2024) observation that the field lacks consensus on how sustainability performance should be measured or credibly signalled to external stakeholders, including investors.

Conclusion:

This study shows that sustainable entrepreneurship is steadily moving from a niche concept to a mainstream approach, where profit and purpose increasingly reinforce each other. While investor caution around scalability persists, particularly for early-stage Indian ventures, purpose-driven start-ups are gaining visibility and relevance in the broader entrepreneurial landscape. International examples confirm that sustainability focused models can succeed globally when embedded into core strategy from the start. With rising consumer consciousness and a clear surge in sustainable start-ups since 2019, the findings point to strong future potential, though greater investor confidence, supportive policy, and consumer education remain necessary to enable sustainable scaling.

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ESG PRACTICES IN BUSINESS: A STUDY OF THE MAHINDRA GROUP IN INDIA

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Abstract:
Environmental, Social and Governance (ESG) has emerged as an important framework for evaluating responsible and sustainable business practices. Contemporary businesses are increasingly assessed not only on profitability and shareholder returns but also on their environmental impact, social responsibility and governance quality. This paper examines the ESG practices of the Mahindra Group in India and explores their relevance for Indian entrepreneurs, particularly micro, small and medium enterprises (MSMEs). The study adopts a descriptive and exploratory research design based on secondary data, including academic literature and Mahindra Group's sustainability, ESG and corporate disclosures. The analysis examines ESG practices under three dimensions: environmental sustainability, social responsibility and governance. The findings indicate that Mahindra's approach integrates climate action, renewable energy, circularity, water and biodiversity stewardship with employee well-being, diversity, skill development, community development, ethical conduct, risk management and stakeholder accountability. The study argues that Indian entrepreneurs need not replicate the scale of large corporations; rather, they can adapt the underlying principles through measurable and context-specific initiatives. The paper concludes that ESG can serve not merely as a compliance mechanism but as a strategic pathway to efficiency, resilience, innovation, stakeholder trust and long-term competitiveness.
Keywords: *ESG, sustainability, Mahindra Group, Indian entrepreneurs*

Introduction:

The role of business in society has expanded considerably in recent decades. Conventional measures of business success have largely emphasised profitability, growth and shareholder returns. However, contemporary business environments increasingly recognise the importance of environmental responsibility, social well-being and sound governance. Environmental, Social and Governance (ESG) provides an integrated framework for assessing these dimensions.

The Environmental dimension addresses a firm's relationship with the natural environment, including carbon emissions, climate change, energy consumption, renewable energy, waste management, water conservation, biodiversity and

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circularity. The Social dimension focuses on employees, customers, communities and other stakeholders through areas such as occupational safety, diversity and inclusion, human rights, skill development and community development. Governance concerns the systems through which organisations are directed and controlled, including ethical conduct, transparency, accountability, risk management, regulatory compliance and stakeholder engagement.

ESG is particularly relevant to Indian entrepreneurship because MSMEs constitute a substantial part of the country's business ecosystem and influence employment, supply chains, resource consumption and local communities. Consequently, ESG cannot be considered exclusively a concern of large corporations. The Mahindra Group provides a relevant Indian case because its sustainability approach incorporates environmental stewardship, social development and governance within its broader responsible-growth strategy.

Objectives of the Study:

The study has following objectives:

1. To understand the Environmental, Social and Governance dimensions of ESG practices with specific reference to the Mahindra Group.
2. To identify the potential relevance and benefits of ESG practices for Indian entrepreneurs and MSMEs.

Review of Literature:

Existing research increasingly indicates that sustainability can contribute to long-term organisational performance when integrated with business strategy rather than treated solely as philanthropy. Jha and Rangarajan (2020) examined corporate sustainability performance in the Indian context and highlighted the importance of integrating sustainability into corporate strategy. Maji and Lohia (2023) and Lunawat and Lunawat (2022) examined the relationship between ESG performance and firm performance in Indian firms and indicated the strategic relevance of ESG.

Khokhawala and Iyer (2022) examined sustainable entrepreneurship in India and emphasised the need to balance economic, social and environmental outcomes. Ghag and Sonar (2024), focusing on Indian SMEs, identified environmental and social practices as important elements of sustainable entrepreneurship and competitiveness, while also recognising constraints such as limited resources and short-term economic pressures.

The literature also distinguishes between sustainability practices and formal ESG management. Businesses may undertake waste reduction, employee welfare or community initiatives without formally measuring or reporting them as ESG performance. The Mahindra Group is therefore significant as a case demonstrating how environmental, social and governance considerations can be linked with strategy, risk management and long-term value creation.

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Research Methodology:

Research Design:

The study employs a descriptive and exploratory research design based on secondary information.

Sources of Data:

The study draws upon peer-reviewed literature relating to ESG and sustainability, research on Indian firms and sustainable entrepreneurship, and Mahindra Group's annual, sustainability and ESG disclosures and official corporate information.

Method of Analysis:

The Mahindra Group case is analysed through the three principal ESG dimensions:

- **Environmental:** climate action, renewable energy, circularity, water and biodiversity.
- **Social:** employee welfare, safety, diversity, skills and community development.
- **Governance:** ethics, accountability, risk management, board oversight and stakeholder engagement.

Limitation:

The study is based on secondary information and does not empirically measure ESG awareness among a statistically selected sample of Indian entrepreneurs. Accordingly, its findings are descriptive and conceptual rather than statistically generalizable.

ESG Practices of the Mahindra Group:

Environmental Dimension:

The environmental component of Mahindra's ESG approach encompasses climate action, renewable energy, circularity, water stewardship and biodiversity.

Climate Change and Decarbonisation: Climate action and decarbonisation are incorporated into the Group's environmental strategy. Given its presence across sectors such as automobiles, farm equipment, technology and hospitality, energy consumption and transportation have significant environmental implications. The emphasis on emissions reduction and cleaner energy provides a relevant model for businesses seeking to reduce environmental risks.

For MSMEs, this principle can be translated into measuring energy and fuel consumption, adopting energy-efficient equipment, using renewable electricity where feasible and establishing annual energy-reduction targets. The underlying principle is a continuous cycle of measurement, reduction, monitoring and improvement.

Renewable Energy: Mahindra's sustainability approach incorporates renewable electricity and energy transition. For smaller enterprises, corresponding initiatives may include rooftop solar installations, renewable-energy procurement, energy-

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efficient lighting and periodic energy audits. Such measures can combine environmental benefits with improved operational efficiency.

Circular Economy: Circularity seeks to move away from the conventional "take–make–use–dispose" model towards reduction, reuse, repair, recovery and recycling. Mahindra's approach to resource efficiency and waste management illustrates how circularity can be integrated into business strategy. MSMEs can apply the principle by reusing packaging, repairing products, recycling waste, reducing single-use materials and incorporating recycled inputs.

Water and Biodiversity: Water conservation is treated as an important sustainability concern, particularly for businesses with substantial water requirements. Measures such as water metering, efficient equipment, rainwater harvesting, water reuse and leakage prevention can be adopted by smaller businesses. Mahindra's recognition of biodiversity further demonstrates that environmental responsibility extends beyond carbon emissions to ecosystems, natural resources and responsible sourcing.

Social Dimension:

The Social dimension addresses people affected by business activities, particularly employees and local communities.

Employee Well-being and Safety: Mahindra's ESG approach incorporates employee health, safety, development and well-being. For MSMEs, meaningful social practices can begin with safe working conditions, protective equipment, training, fair employment practices, health initiatives and grievance mechanisms. Such measures need not require substantial financial resources but can strengthen employee welfare and organisational capability.

Diversity and Inclusion: Mahindra places importance on diversity and inclusion, including women's participation and workplace inclusiveness. Entrepreneurs can adapt this principle through equal employment opportunities, fair recruitment, prevention of discrimination, women's leadership, safe workplaces and work-life balance. Diversity can broaden access to talent and strengthen organisational decision-making.

Skill Development: Investment in human capabilities is another important component of social sustainability. Digital and technical training, leadership development, financial literacy, safety training and continuous professional development can improve employee capabilities and organisational performance.

Community Development: Mahindra's community initiatives cover areas such as education, health, livelihoods, women's empowerment and social development. MSMEs can adopt a locally oriented approach by supporting education, offering internships, training unemployed youth, employing local people and strengthening

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local suppliers. Thus, community engagement can be integrated into the local business ecosystem rather than being restricted to large-scale CSR expenditure.

Governance Dimension

Governance provides the institutional foundation for responsible business conduct.

Board Oversight and Accountability: At the corporate level, ESG requires strategic oversight and accountability. Mahindra's approach demonstrates that sustainability considerations need to be integrated into decision-making and risk management. In MSMEs, the entrepreneur or management team can incorporate ESG review into regular business meetings without establishing a separate ESG committee.

Ethics and Business Integrity: Governance includes anti-corruption, fair competition, transparent accounting, conflict-of-interest management, responsible procurement, confidentiality and legal compliance. For entrepreneurs, a simple code of business ethics combined with appropriate internal controls can provide a practical foundation for responsible governance.

Risk Management and Transparency: ESG risks include environmental risks such as climate change and water scarcity, social risks such as workplace accidents and discrimination, and governance risks such as fraud, corruption, data breaches and non-compliance. Transparent communication, accurate records, clear employment policies, supplier standards and customer grievance mechanisms can strengthen stakeholder accountability.

Integrated ESG Perspective:

The Mahindra case demonstrates that ESG dimensions are interconnected rather than independent checklists. Climate action, renewable energy, circularity, employee safety, diversity, skills, ethics and risk management can collectively contribute to resilience, innovation, stakeholder trust and responsible growth. For instance, electric mobility can simultaneously address environmental concerns, provide cleaner mobility solutions and require responsible innovation and risk management. Similarly, responsible supply-chain practices can combine environmental efficiency, worker welfare and ethical governance.

Relevance to Indian Entrepreneurs:

The principal lesson for Indian entrepreneurs is not to reproduce Mahindra's investments at the same scale but to adapt its underlying principles. Decarbonisation can translate into energy conservation; renewable energy into rooftop solar; circularity into reuse and recycling; employee welfare into workplace safety; diversity into equal opportunities; skill development into employee training; community development into local initiatives; and governance into ethical codes, risk reviews and transparent business practices.

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However, MSMEs face significant barriers, including financial constraints, limited ESG expertise, inadequate human resources, short-term business pressures and difficulties in measuring impact. The perception that ESG is relevant only to large companies can further restrict adoption.

Suggestions:

An MSME-oriented ESG framework may be developed around three measurable areas: environmental performance through energy, waste, water and emissions; social performance through employee safety, diversity and community engagement; and governance through ethics, transparency and compliance.

ESG should also be incorporated into entrepreneurship education. Colleges and entrepreneurship-development programmes can use Indian corporate cases to enable students to translate ESG principles into practical business plans. Entrepreneurs should adopt a "small steps, measurable impact" approach by measuring energy use, reducing waste, improving workplace safety and strengthening ethical practices.

Government agencies, industry associations, financial institutions and incubators can support adoption through ESG training, technical guidance, sustainability toolkits, financial incentives, green financing and digital measurement tools.

Conclusion:

ESG has evolved from a framework primarily associated with large corporations and investors into an important approach to responsible and sustainable business. The Mahindra Group provides an Indian example of integrating environmental responsibility, social well-being and governance into business strategy.

The case demonstrates that environmental initiatives involving climate action, renewable energy, circularity, water and biodiversity can coexist with social priorities such as employee safety, diversity, skill development and community development. Effective governance through ethical conduct, accountability, risk management and stakeholder engagement provides the foundation for these practices.

For Indian entrepreneurs and MSMEs, the significance of the Mahindra experience lies not in the scale of investment but in the adaptability of its principles. ESG can be implemented progressively through energy efficiency, resource conservation, employee welfare, inclusive employment, ethical business conduct, risk management and transparent decision-making. Rather than being perceived solely as an additional cost or compliance obligation, ESG can become a strategic opportunity for efficiency, innovation, risk reduction, stakeholder trust and long-term competitiveness.

A practical pathway for Indian entrepreneurs is therefore: **Understand ESG → Start Small → Measure Impact → Improve Continuously → Integrate ESG into Strategy.**

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Future research should undertake primary surveys among Indian entrepreneurs and MSMEs to assess ESG awareness, identify sector-specific adoption patterns and examine the relationship between ESG awareness and measurable business performance.

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A GLOBAL JOURNAL OF SOCIAL SCIENCES
(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
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TRANSFORMING TRADITION INTO SUSTAINABILITY: AN ESG STUDY OF GREEN GANESH FESTIVALS IN MUMBAI

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Abstract:
Ganesh Chaturthi is one of Mumbai's most iconic cultural and social festivals; however, mass celebrations have historically posed severe environmental challenges due to the widespread use of Plaster of Paris (PoP) idols, heavy-metal chemical paints, non-biodegradable decorations, and improper waste disposal into natural water bodies. To mitigate these ecological hazards, the "Green Ganesh" movement promotes sustainable alternatives, including clay (Shadu mati) idols, organic dyes, biodegradable decor, artificial immersion tanks (kratrim talav), and systematic composting of floral waste (nirmalya).
This study evaluates the awareness, adoption, and impact of these sustainable practices among Mumbai residents through an Environmental, Social, and Governance (ESG) framework—linking environmental conservation, community-led cultural preservation, and civic policy enforcement. Utilizing a mixed-methodology approach, primary data was gathered via a structured questionnaire administered to Mumbai residents, supplemented by secondary data from government reports (MPCB/BMC), peer-reviewed journals, and environmental publications. The findings assess public participation, track household and community (Sarvajanik) adoption rates, and measure public responsiveness to municipal governance initiatives. Ultimately, the study demonstrates that embedding ESG principles into traditional cultural practices preserves religious heritage while driving actionable, long-term urban sustainability.
Keywords: *Green Ganesh Festival, Sustainability, Mumbai, Environmental Protection, Social Responsibility, Governance.*

Introduction:

Ganesh Chaturthi is one of the most celebrated cultural and religious festivals in Mumbai and holds immense social, spiritual, and historical significance in Maharashtra. Introduced as a public festival by Lokmanya Bal Gangadhar Tilak in 1893, it has evolved into a symbol of unity, community participation, and cultural identity. Every year, millions of devotees celebrate the festival through household

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and Sarvajanik (public) Ganesh mandals with great enthusiasm, making it an integral part of Mumbai's cultural landscape and local economy.

Despite its cultural importance, the increasing scale of celebrations has raised significant environmental concerns. The extensive use of Plaster of Paris (PoP) idols, chemical-based paints, plastic decorations, thermocol, and improper disposal of festival waste has contributed to water pollution, solid waste generation, and damage to aquatic ecosystems. Growing urbanization and rising environmental awareness have highlighted the need to balance traditional practices with sustainable development.

The concept of Green Ganesh Festivals has emerged as a sustainable alternative that promotes the use of Shadu Mati (clay) idols, natural colours, biodegradable decorations, artificial immersion tanks, and scientific waste management practices. These initiatives support the principles of Environmental, Social, and Governance (ESG) by encouraging environmental protection, community participation, and responsible governance. This study examines the awareness, adoption, and effectiveness of Green Ganesh practices among Mumbai residents and evaluates how integrating ESG principles can transform traditional festival celebrations into a model of sustainable urban development while preserving the festival's cultural and religious significance.

Literature Review:

literature review helps in understanding the findings of previous studies related to the research topic. It provides a theoretical foundation for the study and identifies the research gap that the present study aims to address

Parker,P.(2026)

Parkar (2026) examined the celebration of Ganesh Utsav across different regions of Maharashtra, particularly comparing Mumbai, Pune, and the Konkan region. The study found that large-scale urban celebrations contribute to environmental pollution due to the use of Plaster of Paris (PoP) idols, chemical paints, and plastic decorations. In contrast, traditional celebrations in the Konkan region follow eco-friendly practices, such as using clay idols and natural decorations. The study concluded that adopting traditional sustainable practices can reduce environmental impact while preserving the cultural significance of the festival.

Krishna, N. (2020)

Krishna (2020) explored the traditional ecological practices associated with Ganesh Festivals in the South Konkan region. The study highlighted the use of natural clay idols, eco-friendly immersion methods, and the reuse of lake clay as part of a sustainable environmental cycle. It concluded that traditional knowledge plays an important role in environmental conservation

and can be integrated into modern green ganesh initiative

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Maharashtra Pollution Control Board (MPCB, 2024)

The Maharashtra Pollution Control Board (2024) reported that the use of PoP idols, chemical paints, and improper idol immersion significantly pollute rivers and lakes and negatively affect aquatic life. The report recommended the use of clay idols, artificial immersion ponds, waste segregation, and public awareness campaigns to promote environmentally responsible Ganesh celebrations across Maharashtra.

Brihanmumbai Municipal corporation (BMC 2024)

The Brihanmumbai Municipal Corporation (2024) introduced several initiatives to encourage Green Ganesh Festivals in Mumbai. These initiatives include promoting eco-friendly idols, establishing artificial immersion tanks, organizing awareness campaigns, and improving waste management during the festival. The report emphasized that cooperation between citizens, Ganesh Mandals, NGOs, and government authorities is essential for achieving sustainable festival celebrations.

United Nations Environment Programme (UNEP, 2023)

The United Nations Environment Programme (2023) emphasized that cultural and religious festivals should adopt sustainable practices to support environmental protection and the Sustainable Development Goals (SDGs). The report highlighted the importance of reducing waste, conserving natural resources, and encouraging community participation, which closely aligns with the Environmental, Social, and Governance (ESG) framework.

Statement of the Problem

Ganesh Chaturthi is an important cultural festival in Mumbai, but large-scale celebrations can create environmental problems due to Plaster of Paris idols, chemical paints, plastic decorations, and improper waste disposal. Although Green Ganesh initiatives promote clay idols, natural colours, biodegradable decorations, artificial immersion tanks, and Nirmalya composting, their adoption remains incomplete. Factors such as affordability, availability, traditional preferences, awareness, and civic facilities may influence people's choices. Therefore, there is a need to assess the awareness and adoption of sustainable Ganesh Festival practices among Mumbai residents. This study examines these practices through an Environmental, Social, and Governance (ESG) framework to support sustainable and culturally responsible celebrations.

Objectives of the Study:

1) To assess the awareness of Green Ganesh Festival practices among Mumbai residents.
2) To examine the adoption of sustainable Ganesh Festival practices in Mumbai.
3) To evaluate the influence of ESG principles on Green Ganesh Festival practices.

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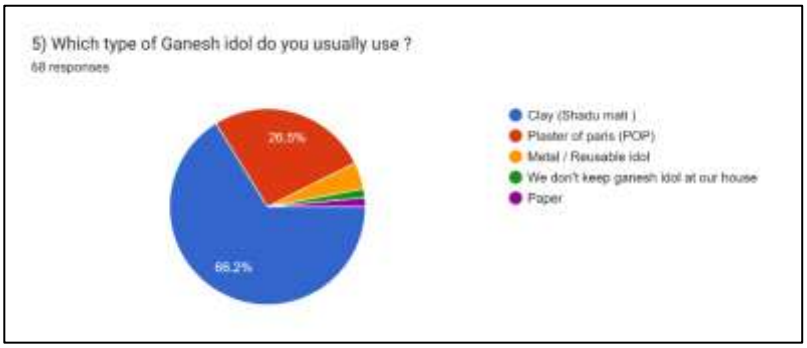
Research Methodology:

Particular	Description
Research Design	Descriptive research design to study awareness, adoption, and perception of Green Ganesh Festival practices using the ESG framework.
Research Gap	Limited ESG-based research on awareness and adoption of Green Ganesh practices among Mumbai residents
Sample Size	68 respondents from Mumbai.
Sampling Unit	Households in Mumbai celebrating Ganesh Chaturthi.
Sampling Method	Convenience Sampling.
Area of Study	Mumbai, Maharashtra.
Primary Data	Structured questionnaire through Google Forms.
Secondary Data	Government reports (BMC & MPCB), research journals, books, published articles, and credible websites.
Data Collection Method	Primary and secondary data collection.
Research Focus	To analyse environmental responsibility, community participation, government initiatives, and public awareness of Green Ganesh practices through the ESG framework.

Primary Data Analysis and Interpretation:

Sample Size: 68 Respondents Target Group: Citizens / Devotees celebrating Ganesh Chaturthi in Mumbai.



Interpretation: The majority of respondents (66.2%) use Shadu Mati (clay) idols, indicating a growing preference for eco-friendly celebrations. However, 26.5% still use PoP idols, highlighting the need for continued awareness and promotion of sustainable alternatives..

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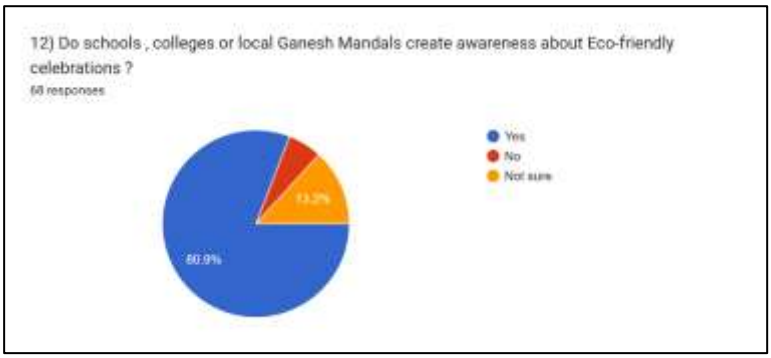
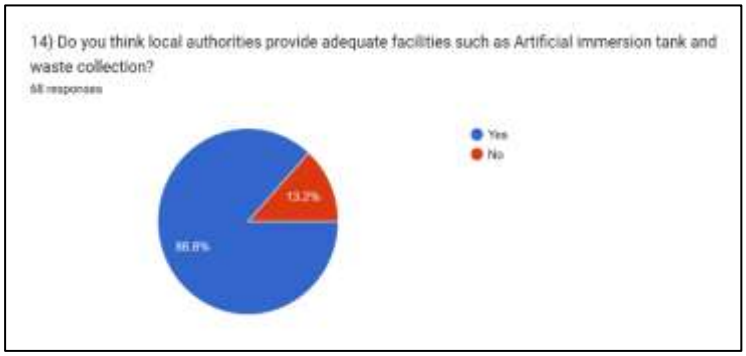
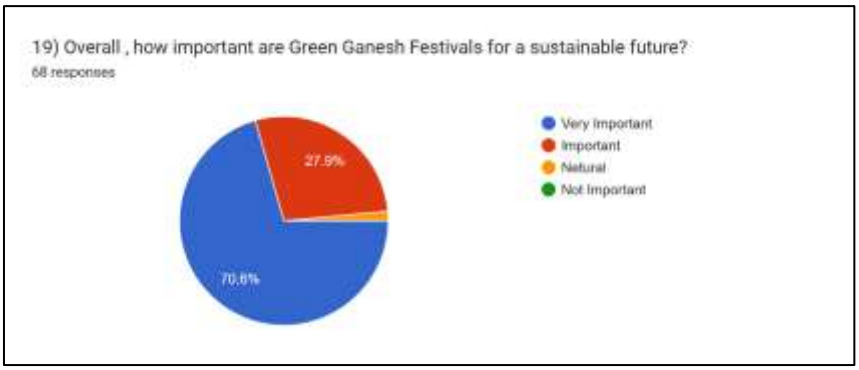


Interpretation: Most respondents (80.9%) agreed that schools, colleges, and Ganesh Mandals create awareness about eco-friendly celebrations. This suggests that community and educational initiatives play an important role in promoting sustainable festival practices.



Interpretation: A large majority (86.8%) believe that local authorities provide adequate facilities for eco-friendly celebrations. This reflects a positive perception of government efforts in supporting sustainable Ganesh Festival management.



Interpretation: Most respondents (70.6%) rated Green Ganesh Festivals as very important, while 27.9% considered them important. This indicates strong public support for adopting sustainable practices to preserve both the environment and cultural traditions.

Hypothesis:

Null Hypothesis (H_0):

There is no significant relationship between the affordability of eco-friendly Ganesh idols and people's willingness to purchase them.

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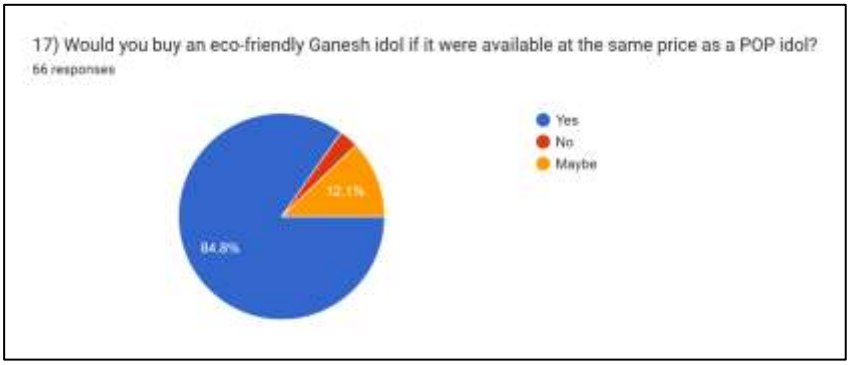
Alternative Hypothesis (H_1):

There is a significant relationship between the affordability of eco-friendly Ganesh idols and people's willingness to purchase them.



The findings show that 84.8% of respondents are willing to buy an eco-friendly Ganesh idol if it is priced the same as a PoP idol, indicating that affordability is a key factor influencing consumer choice. Only 12.1% were uncertain, while 3.0% were unwilling to switch. This suggests that competitive pricing can encourage wider adoption of eco-friendly idols.

Hypothesis Testing:

Based on the above findings the Alternative Hypothesis (H_1) is accepted and the Null Hypothesis (H_0) is rejected, indicating that affordability significantly influences the adoption of eco-friendly Ganesh idols.

Major Findings:

1. Green Ganesh Festivals have emerged as an effective approach to balancing cult ural traditions with environmental sustainability in Mumbai.
2. The study found a high level of awareness and positive acceptance of eco-friendly Ganesh Festival practices among Mumbai residents.
3. The adoption of sustainable practices, such as clay idols, eco-friendly decorations, and proper waste management, is increasing but has not be en fully achieved.
4. Community participation, educational institutions, Ganesh Mandals, and governm ent initiatives play a significant role in promoting sustainable festival celebrations
5. The implementation of Environmental, Social, and Governance (ESG) principles h as positively influenced responsible festival management and environmental cons ervation.

Suggestion:

1. Promote the use of Shadu Mati (clay) idols by improving their affordability and availability.
2. Strengthen awareness campaigns through schools, colleges, Ganesh Mandals, and social media to encourage sustainable festival practices.

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3.Enhance government support by increasing artificial immersion tanks, waste collection facilities, and monitoring during the festival.

4.Encourage community participation in eco-friendly initiatives such as biodegradable decorations and Nirmalya composting.

5.Integrate ESG principles into Ganesh Festival planning through collaboration between government authorities, NGOs, and local communities.

Social Relevance of the Study:

1) Preserves Maharashtra's cultural heritage through sustainable festival practices.
2) Promotes green entrepreneurship and supports local eco-friendly artisans.
3) Encourages responsible consumption during religious festivals.
4) Serves as a model for sustainable management of other cultural festivals.
5) Contributes to building environmentally conscious future generations.

Limitations of the Study:

Geographical Limitation: Study restricted to Ganesh Chaturthi practices in Mumbai.

Sample Representation: Based on 68 respondents; may not represent the entire Mumbai population.

Behavioural Gap: Reported practices may differ from actual festival behaviour.

ESG Measurement: Focuses on awareness and adoption rather than direct environmental impact.

Stakeholder Perspective: Limited representation of mandals, idol makers, NGOs and government authorities.

Dynamic Initiatives: Green Ganesh initiatives and regulations continue to evolve.

Conclusion:

The study concludes that Green Ganesh Festivals offer a sustainable approach to preserving Mumbai's cultural heritage while reducing environmental impacts. The findings indicate that Mumbai residents are increasingly aware of and supportive of eco-friendly festival practices, with many adopting clay idols and other sustainable alternatives. Government initiatives, educational institutions, and community participation have contributed significantly to promoting environmentally responsible celebrations. However, challenges such as the continued use of PoP idols and traditional preferences still exist. Integrating Environmental, Social, and Governance (ESG) principles into festival management can strengthen public participation, improve environmental conservation, and ensure that Ganesh Chaturthi continues to be celebrated in a culturally meaningful and environmentally sustainable manner.

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(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
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FROM FAST TO SAFE: EVALUATING GOVERNMENT-IMPOSED DELIVERY TIME RESTRICTIONS AS AN ESG INITIATIVE

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Abstract:
The rapid growth of quick commerce has increased concerns about employee safety, work pressure, and well-being due to faster delivery expectations. This study examines government measures to discourage ultra-fast delivery claims as an Environmental, Social, and Governance (ESG) initiative, focusing on its Social dimension. Primary data was collected through a structured questionnaire from 25 respondents working in dark stores and delivery-related roles. The findings show that 68% felt safe or very safe, while 72% reported no change in work-related stress. Additionally, 72% were satisfied or very satisfied with the restrictions. The study suggests that safer delivery practices can improve employee welfare but should be supported by realistic targets, better planning, and adequate staffing.
Keywords: *Quick Commerce, Dark Stores, Environmental, Social and Governance (ESG), Employee Well-being, Workplace Safety, Government Intervention*

Introduction:

The rapid growth of the quick-commerce industry has increased demand for ultra-fast deliveries, raising concerns about employee safety, work-related stress, and unrealistic performance expectations. In response, the Government of India has initiated measures to discourage ultra-fast delivery claims and promote safer delivery practices (Barik & Magazine, 2026). However, limited research has examined these measures from the perspective of quick-commerce workers within an Environmental, Social, and Governance (ESG) framework.

This study focuses on the **Social aspect of ESG** and examines how delivery time restrictions affect employee safety, stress, workload, delivery targets, and the overall working environment. It also explores whether these restrictions can help balance customer expectations with employee well-being.

Quick commerce relies on dark stores, efficient order processing, and fast delivery networks. While speed is central to the business model, excessive delivery pressure can affect workers responsible for picking, packing, supervising, and delivering orders. Therefore, considering employee welfare and workplace safety is important for creating a more responsible and sustainable quick-commerce industry.

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Literature Review

1. ESG and the Social Dimension

Elkington (1997) explained that businesses should consider social and environmental responsibilities along with financial performance. This is relevant to quick commerce, where delivery speed should be balanced with worker well-being.

2. Stakeholder Perspective

Freeman (1984) emphasized that businesses have responsibilities towards stakeholders, including employees. In quick commerce, this highlights the importance of considering employee safety and well-being while setting delivery targets.

3. Quick Commerce and Dark Stores

Khattar (2022) and Mukhopadhyay (2022) explain the importance of dark stores, efficient order processing, and delivery coordination in quick commerce. Their work provides context for the pressure created by short delivery timelines.

4. Delivery Speed and Worker Well-being

The focus on ultra-fast deliveries has raised concerns about worker safety and pressure. Barik and Magazine (2026) discuss the move towards safer delivery practices, while Basu (2026) highlights the labour involved in maintaining fast delivery services.

5. Problem Statement

The rapid growth of the quick-commerce industry has increased pressure on workers to meet short delivery times, potentially affecting their workload, stress, and safety. This study examines the impact of government-imposed delivery time restrictions on worker safety, workload, stress, job satisfaction, operational challenges, and company compliance, and assesses their relevance as a Social and Governance component of ESG practices in the quick-commerce sector.

6. Research Gap

Existing research focuses mainly on quick-commerce operations and delivery efficiency. Limited research examines safer delivery measures from the perspective of workers and their connection to the Social dimension of ESG. This study addresses this gap by examining employee safety, stress, workload, and working conditions.

Objectives of the Study:

- To examine the impact of government-imposed delivery time restrictions on the working conditions, safety, and well-being of dark store employees and delivery personnel.
- To evaluate the effectiveness of delivery time restrictions as an Environmental, Social, and Governance (ESG) initiative.

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- To identify the key benefits and challenges of these restrictions and suggest measures to improve delivery efficiency while maintaining employee safety and well-being.

Research Methodology:

Particulars	Details
Research Design	Descriptive research
Type of Research	Primary research
Research Approach	Quantitative
Target Respondents	Dark store employees and delivery-related workers
Sample Size	25 respondents
Sampling Method	Convenience sampling
Data Collection Method	Structured questionnaire
Research Instrument	Google Forms
Number of Questions	15
Question Format	13 multiple-choice questions and 2 open-ended questions
Study Focus	Employee safety, stress, workload, delivery targets, and ESG
Secondary Sources	Books, e-books, research papers, and news articles

Research Contributions:

This study contributes employee-level evidence to the discussion on quick commerce and ESG. The findings may help policymakers understand worker perceptions, assist companies in balancing delivery efficiency with employee welfare, and provide a basis for further research into socially responsible practices in the quick-commerce sector.

Data Analysis and Interpretation:

A total of 25 responses were collected through the structured questionnaire. The analysis below focuses on the questions most directly related to the study objectives. Percentages are calculated using 25 respondents as the sample size.

1. Workload

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(ISSN – 2581-5830)
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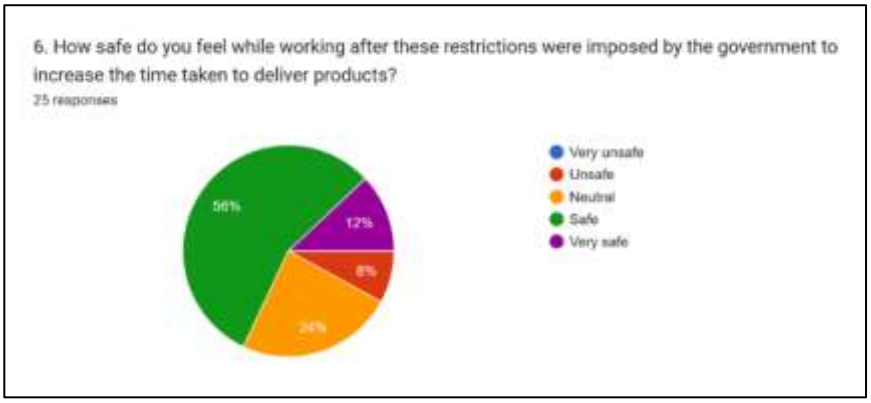
Responses	No. of Respondents	Percentage
No change	15	60%
Reduced slightly	4	16%
Increased slightly	4	16%
Reduced significantly	1	4%
Increased significantly	1	4%
Total	**25**	**100%**

Interpretation:

The majority of respondents (60%) reported no change in their workload after the introduction of delivery time restrictions. While 16% experienced a slight reduction in workload, another 16% reported a slight increase. Only 4% each reported a significant reduction or increase. This indicates that the restrictions have generally not caused a major change in workload for most workers.

2. Safety



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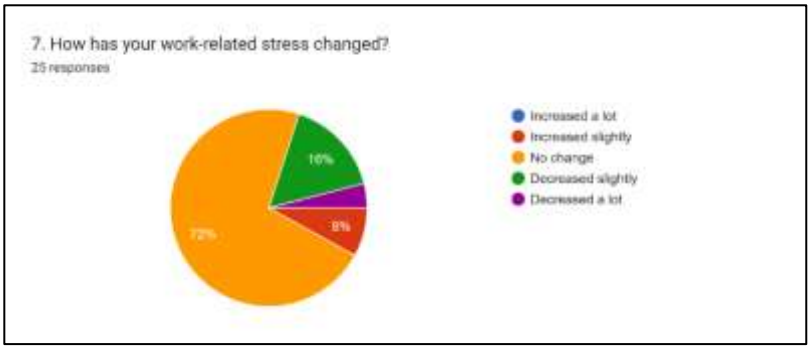
Responses	No. of Respondents	Percentage
Safe	14	56%
Neutral	6	24%
Very safe	3	12%
Unsafe	2	8%
Total	**25**	**100%**

Interpretation:

The findings show a generally positive perception of workplace safety. 56% of respondents reported feeling safe, while another 12% felt very safe. Therefore, 68% of respondents had a positive perception of their safety after the restrictions. However, 24% remained neutral and 8% still felt unsafe, indicating that further improvements in safety measures may be required.

3. Work-related stress



Responses	No. of Respondents	Percentage
No change	18	72%
Decreased slightly	4	16%
Increased slightly	2	8%
Decreased a lot	1	4%
Total	**25**	**100%**

Interpretation:

A significant majority of respondents (72%) reported no change in their work-related stress following the implementation of delivery time restrictions. However, 20% experienced some level of reduction in stress, while only 8% reported a slight increase. This suggests that the restrictions have not increased stress for most workers and may have helped reduce stress for some employees.

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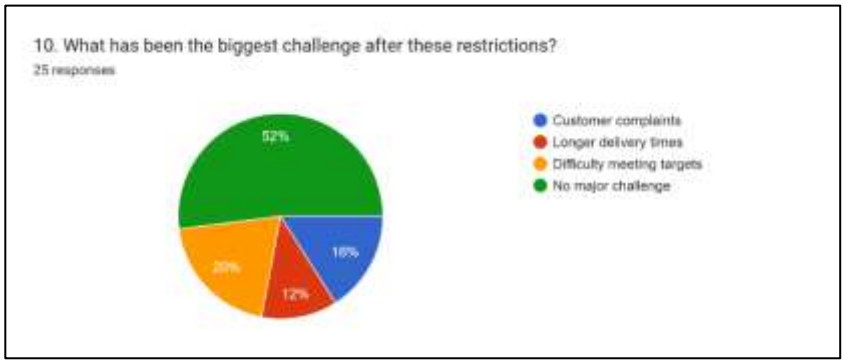
4. Biggest challenge



Responses	No. of Respondents	Percentage
No major challenge	13	52%
Difficulty meeting targets	5	20%
Customer complaints	4	16%
Longer delivery times	3	12%
Total	**25**	**100%**

Interpretation:

More than half of the respondents (52%) stated that they faced no major challenge after the restrictions were introduced. However, 20% reported difficulty meeting targets, making it the most significant challenge among those who experienced difficulties. Customer complaints were reported by 16%, while 12% considered longer delivery times a challenge. Overall, the findings suggest that the restrictions have created some operational challenges but have not been viewed as a major problem by most respondents.

5. Overall satisfaction

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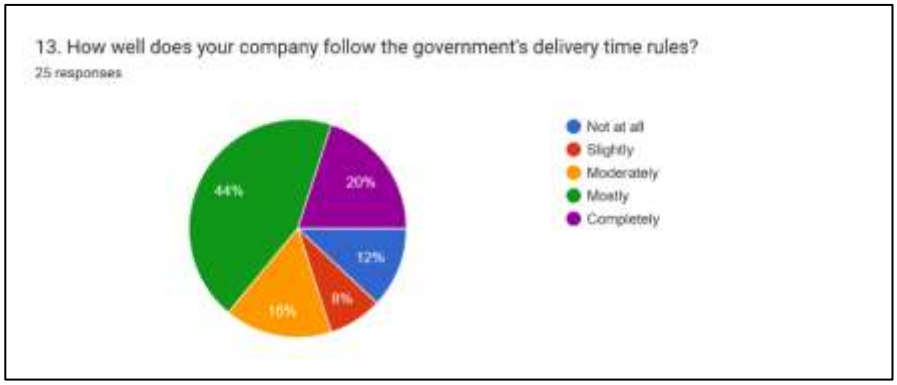
Responses	No. of Respondents	Percentage
Satisfied	14	56%
Neutral	7	28%
Very satisfied	4	16%
Total	**25**	**100%**

Interpretation:

The results indicate a generally positive level of satisfaction with the delivery time restrictions. 56% of respondents were satisfied and 16% were very satisfied, meaning that 72% expressed a positive response overall. A further 28% remained neutral. No respondents reported being dissatisfied, suggesting that the restrictions are generally accepted by the workers surveyed.

6. Company compliance



Responses	No. of Respondents	Percentage
Mostly	11	44%
Completely	5	20%
Moderately	4	16%
Not at all	3	12%
Slightly	2	8%
Total	**25**	**100%**

Interpretation:

The findings show that 44% of respondents believe their companies mostly follow the government's delivery time rules, while 20% reported complete compliance. Thus, 64% perceived at least a high level of compliance. However, 16% reported moderate compliance, while 20% indicated only slight or no compliance. This suggests that although most companies appear to be following the restrictions, implementation is not completely consistent across all workplaces.

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Hypothesis Testing:

The study uses a descriptive research design and a convenience sample of 25 respondents. Therefore, the findings are interpreted descriptively rather than presented as statistically generalisable results.

Hypothesis 1

H₀: *Government-imposed delivery time restrictions have no positive effect on perceived workplace safety.*

H₁: *Government-imposed delivery time restrictions have a positive effect on perceived workplace safety.*

Basis: Table 5.2 – Safety *shows that 68% of respondents felt safe or very safe after the restrictions were imposed. Therefore, the findings* ***support H₁*** *and do not support H₀.*

Hypothesis 2

H₀: *Government-imposed delivery time restrictions have no effect on work-related stress.*

H₁: *Government-imposed delivery time restrictions reduce work-related stress.*

Basis: Table 5.3 – Work-related Stress *shows that 72% of respondents reported no change in stress, while only 20% reported a reduction. Therefore, the findings support H₀ and do not support H₁.*

Findings:

Statistical Findings:

1. 68% of respondents felt safe or very safe after the implementation of the delivery-time measures.
2. 72% of respondents reported no change in work-related stress, showing that safety improvements did not necessarily translate into lower stress.
3. 64% of respondents considered their delivery targets realistic or very realistic.
4. Better planning of deliveries was the most commonly reported benefit, selected by 36% of respondents.
5. Better employee safety was selected as the biggest benefit by 28% of respondents.
6. 72% of respondents were satisfied or very satisfied with the delivery time restrictions.
7. 64% reported that the overall working environment had improved.
8. 64% reported that their company followed the delivery-time rules mostly or completely.
9. 52% reported no major challenge after the restrictions, although difficulty meeting targets and customer complaints remained concerns for some respondents.

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Qualitative Findings:

1. **Improved Sense of Safety:** Many respondents expressed that delivery time restrictions reduced the pressure to rush, helping them feel safer while performing their duties.
2. **Limited Impact on Stress:** Although workers reported feeling safer, several respondents indicated that work-related stress remained unchanged because factors such as delivery targets, customer expectations, and workload continued to create pressure.
3. **More Realistic Work Expectations:** Respondents generally felt that delivery schedules became more practical and achievable after the restrictions were introduced.
4. **Better Planning and Coordination:** Employees noted that improved route planning, order management, and coordination contributed to smoother operations.
5. **Positive Working Environment:** Many respondents perceived an improvement in the overall working environment due to reduced urgency and more manageable delivery expectations.

Suggestions:

1. Set realistic delivery targets that consider traffic, weather, distance, and order complexity.
2. Improve route planning so that delivery personnel are not pressured by avoidable delays.
3. Recruit sufficient staff during peak periods to reduce pressure on existing employees.
4. Maintain well-stocked dark stores to reduce delays in picking and packing.
5. Provide clear communication to customers that delivery estimates can change because of traffic, weather, and safety conditions.
6. Use incentives that reward safe and reliable work rather than speed alone.
7. Continue monitoring employee safety and work-related stress as delivery practices change.

Social Relevance:

The study is socially relevant because it focuses on the people behind quick-commerce services. Delivery speed is convenient for customers, but it should not come at the cost of worker safety or well-being. The findings support the Social aspect of ESG by showing the importance of safer working conditions, realistic expectations, employee support, and responsible treatment of workers. Encouraging safer delivery practices can help companies build a more sustainable relationship with their employees and customers.

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Limitations:

1. The study is based on a small sample of 25 respondents, which may limit the generalizability of the findings
2. Convenience sampling was used, so the sample may not fully represent all quick-commerce workers.
3. The study relies on self-reported responses rather than independently measured data.
4. The study mainly focuses on the Social aspect of ESG, while environmental and governance aspects are not examined in detail.
5. As a descriptive study, it does not establish a direct causal relationship between the restrictions and employee outcomes.

Conclusion:

This study examined the impact of government-imposed delivery time restrictions on quick-commerce workers from an ESG perspective. Based on 25 responses, the findings show a generally positive impact on workplace safety, with 68% of respondents feeling safe or very safe. However, 72% reported no change in work-related stress, suggesting that the restrictions alone cannot address all workplace challenges.

Overall, 72% of respondents were satisfied or very satisfied with the restrictions, while 64% felt that the working environment had improved. The findings suggest that delivery-time restrictions can support the **Social aspect of ESG**, particularly employee safety and well-being. However, companies should also focus on realistic targets, better route planning, adequate staffing, and employee support to create a safer and more sustainable quick-commerce industry.

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A STUDY ON ESG SOCIAL PRACTICES AND TALENT RETENTION IN HIGHER EDUCATION INSTITUTIONS

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Abstract:
Environmental, Social and Governance (ESG) practices have become important for sustainable organizational development. Although ESG is widely discussed in the corporate sector, its relevance to Higher Education Institutions (HEIs) is also increasing. The social dimension of ESG focuses on employee well-being, diversity and inclusion, fair employment, health and safety, professional development, social responsibility, employee participation and ethical relationships. These practices can influence employee satisfaction, organizational commitment, engagement and intention to remain with an institution. This study examines the relationship between ESG social practices and talent retention in Higher Education Institutions through secondary data. The study is based on published research articles, reports, books and institutional literature. The review indicates that socially responsible employment practices create a supportive and inclusive work environment, strengthen employees' identification with institutional values and reduce turnover intentions. In HEIs, where faculty members and professional staff are central to teaching, research, innovation and student development, retaining talented employees is essential for institutional quality and long-term sustainability. The study concludes that ESG social practices should be integrated with human resource policies and institutional strategy. Higher Education Institutions should focus on employee well-being, equitable opportunities, career development, and participative decision-making and transparent implementation of social commitments. Such initiatives can improve employee experience and support long-term talent retention.

Keywords: *ESG, Social Practices, Talent Retention, Higher Education Institutions, Employee Well-being, Diversity and Inclusion, Sustainable Human Resource Management*

Introduction:

Higher Education Institutions play an important role in knowledge creation, skill development, research, innovation and social progress. The quality and effectiveness of these institutions depend significantly on the knowledge, competence and commitment of faculty members, researchers, administrators and other employees.

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Therefore, attracting and retaining talented employees has become a major strategic concern for universities and colleges.

Talent retention refers to an institution's ability to retain competent, skilled and high-performing employees for a long period. High employee turnover may result in the loss of institutional knowledge, increased recruitment costs, disruption in teaching and research activities and reduced continuity in academic programmes. In the higher education sector, employee retention is especially important because faculty members develop long-term relationships with students, research networks, academic departments and professional communities.

Environmental, Social and Governance (ESG) practices provide a framework through which organizations can pursue sustainable and responsible development. The **Social** dimension of ESG focuses on how an organization manages its relationships with employees, students, communities and other stakeholders. Important social practices include employee welfare, workplace safety, diversity and inclusion, fair treatment, equal opportunities, professional development, employee participation and community engagement.

Research indicates that employees are increasingly influenced by the values and social responsibilities of their organizations. When employees perceive that their institution cares about their welfare, provides fair opportunities and promotes a positive work culture, they may experience greater job satisfaction, organizational commitment and willingness to remain. Studies on ESG perceptions also suggest that employee satisfaction and organizational pride can act as important mechanisms connecting ESG practices with retention.

Review of Literature:

Lee et al. (2023)

Lee, Luppi, Simmons, Tran, and Zhang examined the relationship between employees' perceptions of ESG practices and their intention to remain with an organization. The study found that the **social dimension of ESG**, including employee welfare, social responsibility, fair treatment, and workplace relationships, had a significant positive influence on employee retention. The study indicates that socially responsible organizational practices can strengthen employees' commitment and reduce their intention to leave.

Haski-Leventhal, Roza and Meijs (2017)

Haski-Leventhal, Roza, and Meijs studied the relationship between corporate social responsibility and employee identity and behaviour. Their findings suggested that when employees perceive a strong connection between organizational social values and their personal values, they develop greater organizational identification and engagement. This alignment may improve employee loyalty and support long-term talent retention.

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Ikram et al. (2021)

Ikram and colleagues investigated factors influencing faculty retention in higher education institutions in Pakistan. The study highlighted the importance of responsible governance, organizational support, fair policies, and employee-oriented practices. It suggested that transparent management and socially responsible institutional practices can improve faculty satisfaction and encourage talented employees to remain in higher education institutions.

Wiyono et al. (2025)

Wiyono, Dewi, Ambiapuri, Parwitasari, and Hambali examined ESG-driven human resource practices in private higher education institutions. The study found that social practices, such as employee support, inclusion, workplace welfare, and responsible human resource management, positively contributed to employee performance and well-being. The findings imply that stronger social ESG practices can create a positive work environment and support talent retention.

Clemens (2024)

Clemens examined the influence of ESG practices on employee retention and organizational commitment. The study emphasized that the **social component of ESG**, including employee well-being, diversity, inclusion, fair labour practices, and employee participation, contributes to positive employee attitudes. Employees are more likely to remain with organizations that demonstrate genuine concern for their welfare and social values.

Haski-Leventhal and Bargal (2008)

Haski-Leventhal and Bargal explained how organizational support and positive social experiences influence employees' involvement and commitment. Their work highlighted the importance of meaningful participation, social connection, and supportive organizational relationships. These factors are relevant to higher education institutions because a supportive institutional culture can strengthen employee attachment and reduce turnover

Nisar et al. (2022)

Nisar and colleagues examined the factors affecting employee retention and found that **training and development, a positive work environment, and job satisfaction** significantly influence employees' intention to stay. The study demonstrates that employee-centred social practices are important for retaining skilled personnel. In higher education institutions, professional development and supportive working conditions may help retain qualified faculty and administrative staff.

Lee et al. (2023)

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In their study of generational differences, Lee and colleagues found that the impact of ESG practices on retention may vary among different employee groups. The social dimension remained an important predictor of employees' intention to stay. The findings suggest that higher education institutions should design inclusive and flexible social practices that address the expectations of employees from different generations

Authors of "Beyond Practicing" (2024)

This study examined how employees' perceptions of ESG practices influence retention. The findings showed that positive ESG perceptions improve employee retention through increased **job satisfaction and organizational pride**. The study indicates that ESG practices are more effective when employees experience them directly through fair treatment, supportive policies, and meaningful social initiatives.

CUPA-HR (2025)

The CUPA-HR Higher Education Employee Retention Survey identified important factors affecting employee retention in colleges and universities. The report emphasized employee well-being, supportive leadership, career development, recognition, workplace flexibility, and a positive institutional culture. These factors closely relate to the social dimension of ESG and demonstrate the importance of employee-focused practices in retaining higher education talent.

Research Gap:

The reviewed literature shows that ESG social practices such as employee well-being, diversity and inclusion, fair treatment, professional development, supportive leadership, employee participation, and work–life balance can positively influence employee satisfaction, organizational commitment, and retention. However, limited research has directly examined the relationship between ESG social practices and talent retention specifically in higher education institutions, particularly in the Indian context. Therefore, the present study aims to examine how ESG social practices contribute to retaining talented faculty and non-teaching employees in higher education institutions.

Objectives of the Study:

1. To understand the concept of ESG social practices in Higher Education Institutions.
2. To examine the importance of talent retention in the higher education sector.
3. To identify the major ESG social practices that influence employee retention.
4. To review existing literature related to ESG, employee well-being and talent retention.
5. To analyse the relationship between ESG social practices and talent retention.
6. To provide suggestions for improving talent retention through socially responsible institutional practices.

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Research Methodology:

The present study is **descriptive and conceptual in nature**. It is based entirely on **secondary data**. Information has been collected from research articles, academic journals, books, institutional reports, sustainability reports and relevant published literature.

Database: Secondary Data

Significance of the Research : The study titled "ESG Social Practices and Talent Retention in Higher Education Institutions "is significant because it highlights the importance of the social dimension of Environmental, Social, and Governance (ESG) practices in improving employee satisfaction, engagement, well-being, and long-term retention within higher education institutions.

1. **Focuses on Employee Well-Being**
   The study emphasizes how social practices such as employee welfare, work-life balance, health and safety, and supportive work environments can improve employee satisfaction and encourage talented employees to remain with the institution.
2. **Supports Talent Retention**
   Higher education institutions depend on qualified faculty and skilled administrative staff. The study helps identify how fair treatment, employee development, recognition, and inclusive workplace practices can reduce employee turnover.
3. **Improves Institutional Performance**
   Retaining experienced employees supports continuity in teaching, research, administration, and student services. This contributes to better academic quality and overall institutional performance.
4. **Promotes Diversity and Inclusion**
   The research highlights the importance of equal opportunities, diversity, gender equality, and non-discriminatory practices. Such initiatives can create a respectful and inclusive work environment.
5. **Helps in Policy Development**
   The findings may assist educational administrators and policymakers in designing employee-friendly policies related to welfare, professional growth, workplace equity, and employee engagement.

Limitations of the Study:

1. The study is based only on secondary data.
2. No primary data were collected from faculty or administrative employees.
3. The findings depend on the availability and scope of existing literature.
4. Many ESG studies focus on corporate organizations rather than Higher Education Institutions.
5. The study does not compare public and private Higher Education Institutions.

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Scope for Future Research:

1. Primary research may be conducted among faculty members and administrative employees.
2. A comparative study may be undertaken between public and private institutions.
3. The impact of individual ESG social dimensions on employee retention may be measured separately.
4. Future studies may examine employee well-being as a mediator between ESG practices and retention.
5. Research may compare ESG practices across universities in different regions.
6. Longitudinal studies may examine the long-term impact of ESG initiatives on employee turnover.
7. The relationship between ESG practices, employee engagement and institutional performance may be investigated.

Suggestions and Recommendations:

1. Develop a clear ESG social policy: Higher Education Institutions should establish measurable policies related to employee welfare, inclusion and social responsibility.
2. Strengthen employee well-being programmes: Institutions should provide counselling, stress-management support and wellness initiatives.
3. Promote diversity and inclusion: Equal opportunities should be provided in recruitment, promotion, leadership and professional development.
4. Improve career development: Institutions should offer training, mentoring, research support and transparent promotion pathways.
5. Encourage participative management: Faculty and staff should be included in relevant academic and administrative decisions.
6. Support work–life balance: Flexible work practices and reasonable workloads should be considered.
7. Ensure fair and transparent employment practices: Compensation, performance evaluation and promotion procedures should be clearly communicated.
8. Recognize employee contributions: Regular recognition can improve motivation and organizational commitment.

Conclusion:

ESG social practices can play an important role in improving talent retention in Higher Education Institutions. Employee well-being, fair treatment, diversity and inclusion, professional development, work–life balance and participative decision-making can strengthen employee satisfaction, engagement and organizational commitment.

The review indicates that employees are more likely to remain when they perceive that their institution values their well-being, provides fair opportunities and follows socially responsible practices. Therefore, ESG should not be treated only as a

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reporting or compliance framework. It should be integrated into human resource policies, institutional governance and long-term strategic planning.

Higher Education Institutions that create supportive, inclusive and employee-centred work environments may be better positioned to retain talented faculty and staff. Such retention can contribute to improved teaching quality, research performance, institutional stability and sustainable educational development.

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(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
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ARTIFICIAL INTELLIGENCE AND ESG ANALYTICS: A COMPARATIVE STUDY OF ESG PERFORMANCE

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Abstract:
Environmental, Social and Governance (ESG) has become a key framework for evaluating how businesses manage sustainability, employees, stakeholders and responsible decision-making, while Artificial Intelligence (AI) is increasingly used for productivity, decision-making and reporting. Existing research generally shows a positive relationship between AI adoption and overall ESG performance, but the effect differs across the three pillars. Comparative evidence from China, India, Europe and multi-country markets shows that Environmental and Governance outcomes are usually clearer, while the Social dimension is more mixed; Indian evidence has even reported a negative relationship between AI adoption and the Social dimension in one major firm-level study.
This study combines a literature review with a 99-response employee survey on the Social aspects of ESG. Results show increased workload (44.4%), stress/fatigue (53.5%), lower job security (38.4%), and insufficient AI training (72.7%). The main concerns were workload/pressure (31.3%), job security (27.3%), and lack of training/reskilling (20.2%).
The study does not argue AI is harmful; it concludes AI should be treated as an enabling capability whose ESG value depends on how its benefits and risks are managed, with productivity gains used to expand operations, redistribute workload and reskill employees rather than only cut costs.
Keywords: *Artificial Intelligence, ESG, Social ESG, Employee Well-being, Job Security, AI Adoption.*

Introduction:

ESG is now central to how companies are evaluated, covering environmental impact, employee and stakeholder treatment (Social), and transparency and accountability (Governance). Businesses affect employees, customers, investors and communities, while adopting AI technologies—machine learning, natural language processing and predictive analytics—that automate tasks and support decision-making. In ESG analytics, AI helps collect and analyse data, identify risks, and strengthen reporting and monitoring.

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However, higher AI adoption does not always improve ESG performance. While AI can increase efficiency, it may also cause workload changes, job insecurity, stress, inadequate training, and displacement—issues that overall ESG scores may hide when Environmental or Governance performance improves while Social outcomes remain weak.

The literature reflects this divide. China-based studies generally report positive AI–ESG relationships via digital transformation, efficiency and disclosure. Indian evidence is smaller and more mixed: Mohapatra et al. (2024) report positive effects on overall ESG, Environmental and Governance performance, but a negative relationship with the Social dimension. European and multi-country research suggests organisational, leadership, industry and country conditions all shape the strength of the AI–ESG relationship.

This creates the study's purpose: rather than assuming overall ESG improvement benefits employees equally, it examines the Social pillar closely, using the literature as background and an employee survey for direct evidence of workplace experience — aiming not to reject AI, but to identify prominent Social concerns and how businesses can manage them.

Literature Review:

China-based studies. Shen et al. (2025) used a large language model to measure firm-level AI adoption and found it improves corporate ESG performance, with effects varying by firm characteristics. Research at a 2024 conference found both direct and digital-transformation-mediated positive effects among Chinese listed firms. A 2025 Sustainability study of Shanghai/Shenzhen-listed firms (2010–2023) found AI capability improves ESG mainly through resource allocation and efficiency. Xie, Luo and Tan (2025), using China's AI Innovation Pilot Zones as a quasi-natural experiment, found AI improves ESG through eased financial constraints, green innovation and better disclosure. Xiao et al. (2025) examined AI-driven ESG performance in state-owned enterprises and called for larger, mixed-method studies of long-term risk. Liu, Kuang and Li (2026) and Li (2026) both report positive AI–ESG relationships, mediated by green innovation, transparency and digital transformation.

India-based studies. Mohapatra et al. (2024) studied 253 listed Indian companies (2016–2023) and found AI adoption significantly improves overall ESG, Environmental and Governance performance, but is negatively related to the Social dimension — showing AI does not benefit all pillars equally. Jain and Choudhary (2026) found a significant positive effect of AI on ESG ratings using Indian annual-report and CRISIL data.

European and multi-country studies. Khlifi, Ben Ali and Hermi (2025) studied 122 STOXX 600 firms (2021–2023) and found AI adoption positively mediates the

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link between executive cultural diversity and ESG performance. Alghalayini (2026), covering 480 firms across six countries (2015–2023), found a positive AI–ESG association overall, with Environmental gains strongest while the Social pillar showed a nonlinear pattern at high AI intensity.

Research gap. The literature shows AI adoption generally improves overall ESG, but effects vary by country and pillar — China's evidence is more consistently positive, India's is more mixed at the pillar level. Most studies rely on listed-firm disclosures and aggregate scores, obscuring actual workplace experience behind a Social score. This study addresses that gap by examining employee-level Social concerns directly, rather than only an aggregate ESG figure.

Research Methodology:

This study uses a mixed-source design: a secondary comparative review of existing AI–ESG research across China, India, Europe and multi-country markets, and primary data from a short structured questionnaire distributed to employees, focused on the Social dimension identified as least consistent in the literature.

Data sources: Secondary data came from published academic and conference studies selected for relevance, clear methods/findings, and comparative usefulness. Primary data came from a Google Forms survey (99 responses) covering AI use at work, workload, job security, stress/fatigue and training/reskilling.

Objectives: examine the AI–ESG relationship using existing research; compare findings across India, China and international markets; explain why the Social dimension needs separate attention; identify the most prominent employee-level Social concerns; test whether workload, job security, stress and training gaps emerge as major concerns; and suggest practical measures to improve Social outcomes while retaining AI's productivity benefits.

Limitations: The 99-response survey is a convenience sample, not representative of all employees or Indian businesses; it captures self-reported perceptions rather than verified productivity or employment changes; no strict causal relationship is established; and secondary studies use different samples and measures, limiting direct comparison.

Data Analysis:

The 99-response survey found AI or an AI-based system currently used in 77.8% of represented workplaces, not used in 9.1%, with 13.1% unsure — indicating high AI presence.

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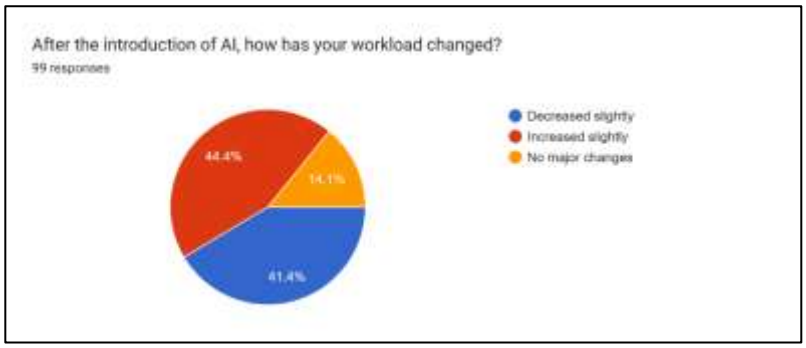
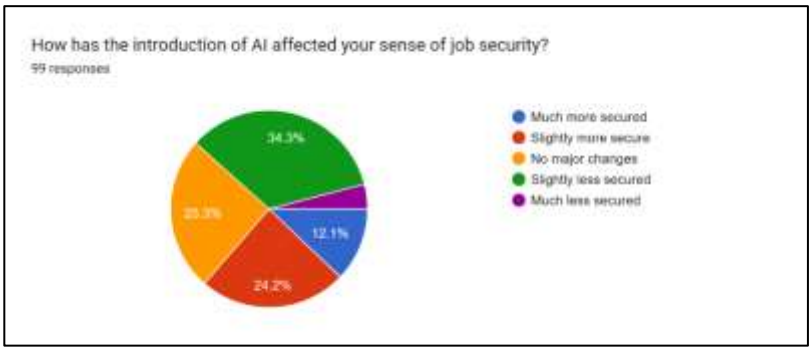


Workload: results were mixed — 44.4% reported a slight increase, 41.4% a slight decrease, and 14.1% no change, suggesting AI-driven productivity does not automatically reduce workload.



Job security: responses were divided — 38.4% felt less secure (34.3% slightly, 4.0% much less), 36.3% felt more secure, and 25.3% reported no major change, indicating a substantial group experiencing reduced security without universal insecurity.

Stress/fatigue: this was one of the clearest findings — 53.5% reported increased stress or fatigue, 29.3% reported a decrease, and 17.2% reported no major change, showing business-level efficiency does not necessarily improve the employee experience.

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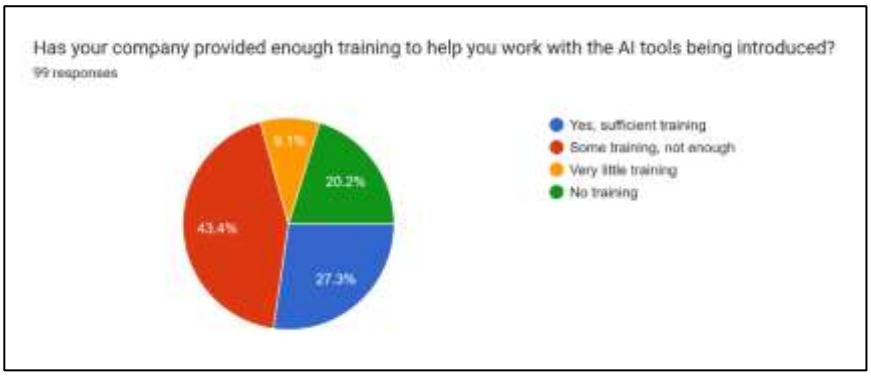
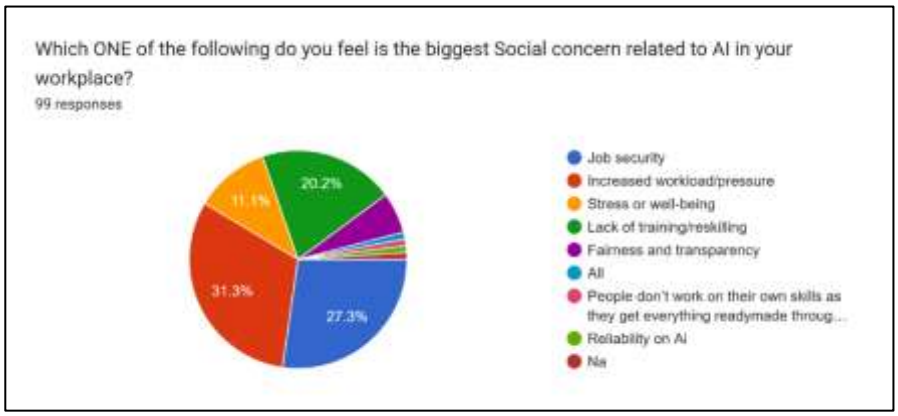


Training: only 27.3% received sufficient training; the remaining 72.7% received training that was insufficient (43.4%), very little (9.1%), or none (20.2%) — a clear gap between AI implementation and employee preparedness.



Biggest Social concern: increased workload/pressure was the top concern (31.3%), followed by job security (27.3%), lack of training/reskilling (20.2%), and stress/well-being (11.1%), with other concerns accounting for a small remaining share.

Discussion and Findings:

The literature and survey together give a balanced picture. Comparative research shows AI generally supports better overall ESG performance through efficiency, digital transformation and governance mechanisms, with China's evidence most consistent and India's more mixed, including Mohapatra et al.'s (2024) negative Social-dimension finding. The survey shows what this looks like at the employee level: the top concern was workload/pressure (31.3%), followed by job security (27.3%), training gaps (20.2%) and stress (11.1%) — suggesting the Social challenge lies less in AI itself and more in how businesses introduce and distribute its benefits.

Notably, the workload result is divided (44.4% increase, 41.4% decrease, 14.1% no change), so the study does not claim AI always increases workload — rather, the effect is uneven and implementation-dependent. Job security and workload should

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also not be seen as separate: if AI expands what a business can handle, that capacity can support growth and new roles rather than only workforce reduction.

Proposed business approach:

For increased workload/pressure, businesses should redirect AI-driven productivity gains toward expansion and added workforce capacity rather than reduction, supporting better workload distribution and potential job creation. For job insecurity, roles should be redesigned and expanded around AI rather than treating automation only as replacement, supporting job continuity and new AI-supported roles. For training gaps, structured, role-specific training should be provided before or alongside implementation, improving employee readiness. For stress/fatigue, businesses should track workload and well-being after implementation and adjust targets accordingly, supporting a healthier employee experience. In short, the recommended shift is from an "AI-as-cost-cutting" approach to an "AI-as-growth-and-reskilling" approach — not to stop automation, but to ensure productivity gains are shared through growth, added capacity, development and better work allocation.

Overall findings: AI adoption is widespread (77.8% current use) and directly tied to daily work; workload effects are mixed but slight increase is the largest group (44.4%); stress/fatigue is a stronger concern (53.5% increased); job security is divided (38.4% less secure); training is a major gap (72.7% insufficient); and the top Social concerns are workload/pressure and job security, followed by training and stress — confirming that overall ESG improvement does not guarantee equal improvement across all three pillars.

Conclusion:

This study compared AI–ESG research from China, India, Europe and multi-country markets with primary employee-level evidence. The literature broadly supports a positive AI–overall ESG relationship, but the three pillars do not necessarily improve equally: Environmental and Governance outcomes are generally more consistent, while the Social dimension is more mixed, and Indian evidence in particular reports a negative AI–Social ESG relationship in one major study.

The primary survey (99 respondents) adds detail: 53.5% reported increased stress/fatigue, 44.4% reported increased workload, 38.4% reported reduced job security, and 72.7% reported insufficient AI training; the leading Social concerns were workload/pressure (31.3%) and job security (27.3%), followed by training/reskilling (20.2%) and stress/well-being (11.1%).

The study does not conclude AI is bad for businesses or employees, but that AI alone cannot guarantee balanced ESG performance — Social outcomes depend heavily on implementation and how productivity gains are distributed. A practical approach uses AI not only to cut costs but to expand capacity, create or redeploy roles, distribute

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workload better, and invest in training — retaining AI's efficiency benefits while reducing Social risk.

The study's main contribution is linking the comparative AI–ESG literature to direct employee experience: organisations should not judge AI's success only by productivity or an aggregate ESG score. Sustainable AI adoption requires considering Environmental, Social and Governance outcomes together, with particular attention to the people experiencing the technology in their daily work.

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ESG AWARENESS AND PURCHASE CONSIDERATIONS AMONG COLLEGE STUDENTS: A DESCRIPTIVE STUDY

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Abstract:
*This study examines **ESG awareness and reported purchase considerations among college students**. Primary data were collected from **152 students** through a structured questionnaire and analysed using descriptive research design. The findings show that **51.3%** had heard of ESG, while **73.0%** reported considering ESG-related factors while shopping. However, quality and price remained important purchase factors. When price and quality were equal, **51.3%** preferred environmentally friendly products and **18.4%** preferred socially responsible products. The study concludes that ESG considerations complement conventional purchase factors.*

Keywords: *ESG Awareness, Purchase Decisions, Consumer Behaviour, Sustainable Consumption, College Students, Social Responsibility*

Introduction:

Consumers today are increasingly concerned about how companies affect the **environment and society**, along with traditional factors such as price and quality. These concerns are broadly covered under **Environmental, Social and Governance (ESG)**. The Environmental dimension includes pollution control, waste reduction, energy efficiency and responsible resource use. The Social dimension focuses on employee welfare, fair treatment, human rights and community well-being, while Governance relates to transparency, accountability and ethical decision-making.

Although ESG is gaining importance, the term may still be unfamiliar to many college students. However, students may already practise ESG-related behaviours such as using reusable products, avoiding food waste, choosing durable products and supporting local businesses. Their purchase decisions are also influenced by **price, quality, brand, reviews, discounts and product features**.

Therefore, this study examines **ESG awareness and reported purchase considerations among college students**, including those unfamiliar with the term ESG, using primary data from **152 respondents** analysed through descriptive statistics.

Literature Review:

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Sustainability has become an important factor in consumer behaviour, with research increasingly moving from green consumption towards broader **ESG** considerations.

Yadav and Pathak (2016) found that environmental concern and knowledge influenced green purchase intentions among young Indian consumers, highlighting the importance of environmental awareness.

Prakash and Pathak (2017) reported that environmental concern, personal norms, attitudes and willingness to pay influenced young consumers' intention to purchase eco-friendly packaged products.

Ansu-Mensah (2021) studied 478 university students and found that perceived green quality was a strong factor in purchase intention, while price, perceived value and awareness also influenced decisions. This indicates that awareness alone may not determine purchase choices.

Koh, Burnasheva and Suh (2022) found that social and governance initiatives positively affected consumers' perceptions of brand credibility, image and quality, demonstrating that responsible business practices extend beyond environmental concerns.

Tan et al. (2025) reviewed 56 empirical studies and identified perceived ESG performance, transparency and greenwashing concerns as important influences on consumer responses.

Research Gap

Previous research has largely focused on **green consumption and environmental awareness**, with comparatively less attention to ESG as an integrated concept. This study addresses this gap by examining **ESG awareness and reported purchase considerations among 152 college students**, using primary data and descriptive analysis to examine awareness, responsible practices and purchase preferences.

Research Objectives:

The study aims to:

1. To assess the extent to which college students recognise environmental, social, and ethical considerations in their everyday purchasing decisions, even when they may not be familiar with the term ESG.
2. To examine the extent to which college students report considering ESG-related factors in their purchase decisions.
3. To compare the importance of ESG-related considerations with conventional purchase factors such as price, quality, brand, reviews, discounts, and product features.
4. To identify the environmental practices and product attributes most commonly considered by students in their consumption and purchase-related choices.

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5. To examine students' reported willingness to consider companies' treatment of employees, communities, and other stakeholders when making purchase decisions.

Research Methodology:

1. **Research Design:** The study uses a **descriptive research design** to examine ESG awareness and reported purchase considerations among college students.
2. **Population, Sample Size and Sampling Technique:** The study comprises **152 college students**, selected using **non-probability convenience sampling** based on their availability and willingness to participate.
3. **Source of Data:** The study uses **primary data** collected through a structured questionnaire.
4. **Data Collection Instrument:** A **30-question structured questionnaire** was used, covering **five sections**: Basic Information, Shopping Style, Everyday Choices, Shopping Situations, and ESG Awareness. It collected demographic details, purchasing behaviour, sustainability practices, purchase preferences, and ESG awareness using multiple-choice questions and a five-point Likert scale.
5. **Variables Covered:** The study covers **demographic, environmental, social, purchase decision and ESG awareness variables**. Purchase factors include quality, price, brand, features, reviews, discounts and ESG-related attributes.
6. **Data Collection:** A total of **152 completed responses** were collected and compiled in Excel for analysis.
7. **Scope of the Study:** The study examines ESG-related awareness and reported purchase considerations, particularly environmental and social factors, in comparison with conventional purchase factors. It does not establish actual sales behaviour or causality.
8. **Limitations of the study:**
    1. **Sample Size:** The study is based on 152 respondents, so the findings may not represent all college students.
    2. **Sample Composition:** Most respondents (77.6%) are Commerce students. Therefore, the findings may not fully represent students from other disciplines.
    3. **Age Group:** A large majority of respondents (77.0%) are aged 17–19 years. Hence, the views of older students are less represented.
    4. **Generalisation:** The findings are based only on the students who participated in the survey and may not apply to all colleges or regions.
    5. **Self-Reported Responses:** The study is based on what respondents reported about their attitudes and behaviour, which may differ from their actual purchasing behaviour.
    6. **Questionnaire Scope:** The questionnaire covers selected ESG-related factors and may not include all factors that can influence purchase decisions.

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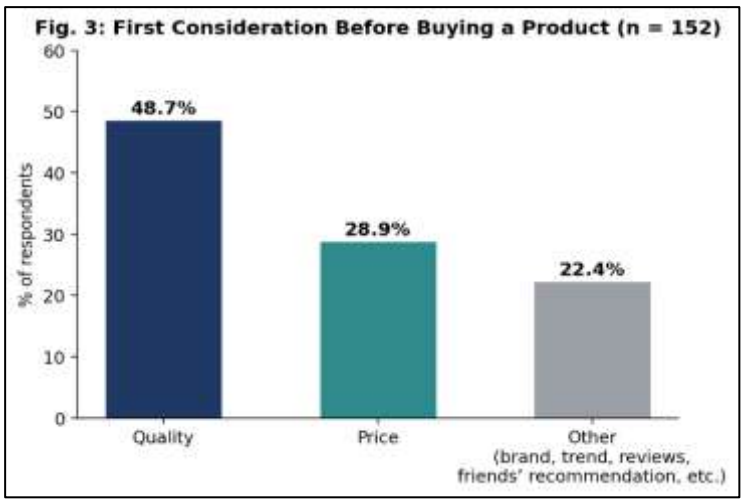
Data Analysis and Interpretation:

The study is based on **152 responses** collected through a structured questionnaire. The data was analysed using **descriptive techniques**, mainly frequency and percentage, and the responses were interpreted section-wise.

Respondent Profile: The respondents are mainly young college students. **77% aged 17–19 years**, while 58.6% are female. Commerce students form the largest group (**77.6%**), and first-year students account for **43.4%** of the sample. Thus, the findings mainly reflect the views of young college students, particularly Commerce students.

Table 1: Respondent Profile Summary (n = 152)

Demographic Variable	Category	% of Respondents (n = 152)
Age	17–19 years	77.0%
Gender	Female	58.6%
Course	Commerce	77.6%
Year of Study	First Year	43.4%



General Purchasing Behaviour: Quality (48.7%) and **price (28.9%)** were the leading factors considered during purchases. Further, **40.8%** reported purchasing products once or twice a month. This indicates that practical considerations, particularly product quality and affordability, remain central to students' initial purchase decisions.

Environmental and Social Practices: The responses reveal the presence of responsible consumption practices. **63.8%** reported always avoiding food waste, while **50.7%** always carried their own water bottle. Respondents also showed consideration for product durability, reuse and repair, local businesses, environmental pollution and fair treatment of workers. However, the frequency of

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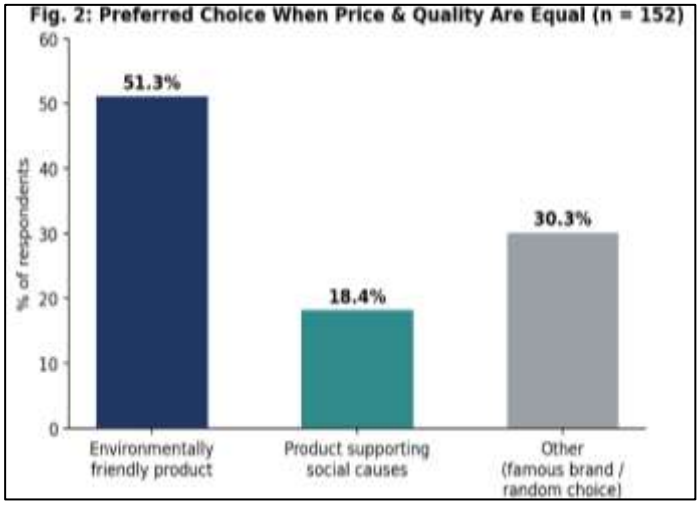
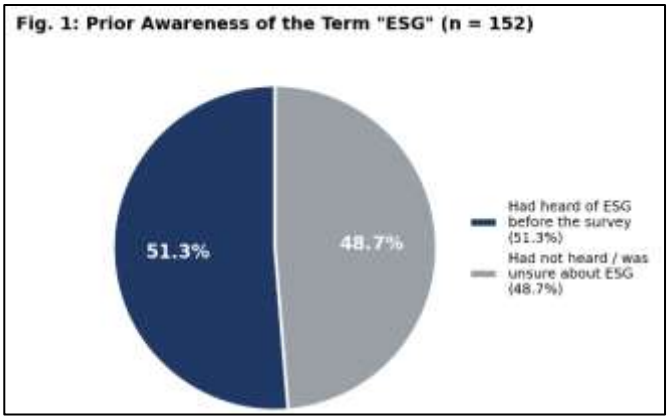
several practices varied, indicating that responsible consumption is present but not consistently followed by all respondents.



ESG and Purchase Decisions: ESG factors influence students particularly when other product factors are similar. **55.3% would choose a company known for fair treatment of workers**, while **51.3% would choose an environmentally friendly product when price and quality are the same**. However, quality, price and product features remain stronger factors in normal purchase situations. **41.4% sometimes** and 23% often show willingness to pay more for responsible products. **Interpretation:** The responses indicate that students report considering ESG-related factors more readily when conventional factors such as price and quality are comparable.



ESG Awareness: Around **51.3% of respondents had heard of ESG** before the survey, while the remaining respondents had either not heard of it or were unsure. After ESG was explained, 44.1% said they sometimes and 28.9% often consider ESG-related factors while shopping. Further, **33.6% definitely** and 26.3% probably want to learn more about ESG. **Interpretation:** Students may demonstrate ESG-related consumption considerations even when they are not formally familiar with the term ESG.

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Major Findings:

1. **ESG Awareness & Considerations:** 51.3% of respondents had heard of ESG, while 48.7% had not heard of it or were unsure. 73.0% reported that they sometimes or often consider ESG-related factors while shopping.
2. **Environmental Behaviour:** Avoiding food waste was common, with 63.8% always following this practice. Also, 50.7% always carried a reusable water bottle.
3. **Importance of Quality:** Quality was the most important first purchase consideration for 48.7% of respondents.
4. **Preference for ESG Products:** When price and quality were equal, 51.3% preferred an environmentally friendly product, while 18.4% preferred a product supporting social causes.
5. **Company Behaviour & Fair Labour Practices:** 44.7% stated that a company's behaviour affects their purchase choice quite a lot or very much. 55.3% preferred a company known for treating its workers fairly.
6. **Eco-Friendly Packaging:** Only 9.2% considered eco-friendly packaging the most attractive offer, compared with 41.4% for Buy 1 Get 1.
7. **Importance of Price and Quality:** When choosing a responsible company, 44.1% preferred better quality and 27.0% preferred affordable prices.
8. **Interest in ESG:** Nearly 60% of respondents showed interest in learning more about ESG and responsible shopping.

Conclusion:

The study concludes that **college students report meaningful consideration of environmental and social factors in their purchase decisions, even though formal awareness of ESG is not universal**. While only **51.3%** had heard of ESG, **73.0%** reported considering ESG-related factors sometimes or often while shopping. The findings also show that **quality, price, features and brand remain important purchase factors**. However, when price and quality were equal, **51.3% preferred an environmentally friendly product and 18.4% preferred a product supporting social causes**, indicating a reported preference for environmentally responsible choices when price and quality are comparable.

Overall, the study suggests that **ESG considerations complement rather than replace conventional purchase factors**. Students appear willing to consider responsible business practices, but their choices depend on the overall value offered by the product.

Since the study is descriptive, these findings reflect **reported awareness, preferences and behaviours and do not establish a causal relationship between ESG awareness and purchase decisions**.

Suggestions / Recommendations:

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Based on the findings of the study, the following practical recommendations are suggested:

1. **Introduce an ESG "Scan Before You Buy":** Companies can use QR codes on products to provide quick information about materials, packaging, labour practices and environmental efforts.
2. **Promote "Responsible + Value" Products:** Since quality and price remain important to students, companies should combine ESG benefits with affordability, durability, better product life, energy efficiency and warranties.
3. **Use Digital Platforms for ESG Awareness:** Colleges and companies can use accessible digital platforms such as short videos, infographics and QR-based content to communicate ESG practices in a simple and engaging manner.
4. **Introduce Responsible Choice Filters:** E-commerce platforms can offer filters for recyclable packaging, cruelty-free products, energy efficiency, ethical sourcing and responsible labour practices to make responsible choices easier.
5. **Highlight Cost Benefits:** ESG campaigns should explain how durable, reusable and energy-efficient products can reduce replacement and consumption costs.
6. **Promote Small Sustainable Actions:** Colleges can encourage practical habits such as reducing food waste, carrying reusable bottles, choosing durable products and repairing items before replacing them.

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AI FOR GREENWASHING DETECTION: EXPLORING CONSUMER TRUST AND HUMAN OVERSIGHT

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Abstract:
The rapid growth of Environmental, Social, and Governance (ESG) reporting has increased corporate sustainability disclosures while also raising concerns about greenwashing, where companies make misleading environmental claims. Traditional verification methods are often slow and resource-intensive, creating a need for automated solutions. This study examines the role of Artificial Intelligence (AI) and Machine Learning (ML), including Natural Language Processing (NLP), Large Language Models (LLMs), and Retrieval-Augmented Generation (RAG), in detecting greenwashing. Using a mixed-methods approach, the research combines a review of recent literature with survey data collected from college students. The findings show that while respondents recognize AI's ability to analyse large volumes of information efficiently, they prefer human oversight for reliable evaluation. The study concludes that AI is most effective as a decision-support tool for improving the accuracy and transparency of corporate sustainability assessments.
Keywords: *Corporate greenwashing, artificial intelligence (ai), machine learning (ML), Natural Language Processing (NLP), Large Language Models (LLMs), Retrieval-Augmented Generation (RAG), Student Awareness, Sustainability Assessment.*

Introduction:

Growing global concern about climate change and sustainable development has made corporate sustainability a key business priority rather than just a marketing strategy. Companies now communicate their environmental initiatives through ESG reports, product labels, advertisements, and digital platforms. At the same time, the rise in sustainability claims has increased the prevalence of greenwashing, where organizations exaggerate or misrepresent their environmental performance to appeal to environmentally conscious consumers.

Identifying greenwashing is challenging because misleading claims often rely on vague language, selective disclosure of information, or symbolic environmental imagery instead of outright false statements. Manual verification of such claims is time-consuming and difficult to perform on a large scale.

Artificial Intelligence (AI) and Machine Learning (ML) provide an efficient alternative by using techniques such as Natural Language Processing (NLP), Large Language

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Models (LLMs), and Retrieval-Augmented Generation (RAG) to analyze sustainability-related content and compare it with reliable environmental data sources.

This study combines a review of existing literature with survey responses from college students to examine the potential of AI based tools in detecting greenwashing and to understand public confidence in their use. The findings also highlight the importance of maintaining human oversight to ensure trustworthy and transparent sustainability assessments.

Greenwashing projecting a false or exaggerated environmental image has been studied since Delmas and Burbano's 2011 framing of it as weak environmental performance paired with strong environmental messaging. Lyon and Montgomery later broadened this to include selective disclosure: companies highlighting good numbers while staying silent on bad ones. Typical tactics include unsupported claims, vague sustainability language, irrelevant comparisons, and green-coded visual branding.

Detection was traditionally manual content analysis, audits, NGO reports, journalism which is accurate but slow, expensive, and hard to scale globally. NLP offered a scalable alternative: early work used classical classifiers (logistic regression, random forests, SVMs) to sort sentences by environmental theme, though these struggled with tone, irony, and context. Transformer models (BERT and successors) improved on this by better distinguishing concrete claims (specific emissions figures) from vague ones ("greener tomorrow" type language). A 2026 Journal of Cleaner Production study reportedly pushed accuracy further by combining structured ESG data with text-based deep learning rather than relying on text alone.

Large Language Models (LLMs) enable zero-shot and few-shot reasoning across massive sustainability reports. Recent research shows LLMs detecting "selective silence "instances where companies deliberately avoid reporting on mandatory material issues. To mitigate hallucination risks, Retrieval Augmented Generation (RAG) models link LLMs directly to verified external repositories, such as satellite emissions trackers or regulatory filings, establishing real time grounding.

Modern corporate marketing relies heavily on visual media. Evaluating Multimodal AI (2026) highlights models that evaluate textual claims alongside imagery (e.g., imagery of forests paired with industrial manufacturing). Multimodal approaches capture discrepancies between symbolic visual representations and technical disclosures.

Literature documents clear benefits of AI detection: continuous monitoring, speed, objectivity, and processing capacity. Conversely, key limitations persist: data bias, black-box lack of explainability, sector-specific jargon variations, and false positives. Scholars consistently argue that AI should serve as an assistive layer to flag risk, preserving human expert judgment for final verification.

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While literature covers the algorithmic design of greenwashing detection models (NLP, LLMs, RAG), limited research evaluates public and student readiness to trust these tools. Technical viability does not automatically guarantee user adoption or social trust. A gap exists in empirical research evaluating how educated consumers interpret automated "green scores" and whether they demand human verification before trusting AI claims. This study fills this gap by coupling a technical review with primary empirical data gathered from an active consumer cohort.

Importance of the Study:

1. Regulatory alignment: As disclosure frameworks move from voluntary guidelines to mandatory requirements (such as the EU's Corporate Sustainability Reporting Directive and Green Claims Directive), the sheer amount of environmental text needing review is exceeding what manual reviewers can handle making automated support increasingly necessary for compliance and enforcement.
2. Scale of coverage: Unlike manual audits, journalism, or NGO investigations, an automated approach can track environmental claims across a large number of firms, sectors, and languages at once.
3. Better-informed markets: More accurate detection helps investors and ESG oriented funds assess environmental risk correctly, limiting the mispricing of capital that results from overlooked greenwashing.
4. Protecting consumers: Equips buyers and advocacy organizations with a means to check the validity of environmental claims prior to purchase, lowering the risk of being misled by marketing.
5. levelling the playing field: Reduces the chance that companies genuinely investing in sustainability lose ground to competitors who prioritize image over actual environmental performance.
6. Contribution to method: Pushes NLP/ML capability toward identifying subtle rhetorical tactics vagueness, selective emphasis, symbolic messaging rather than outright false statements, which is a more difficult task given how contested "ground truth" is in this space.
7. Broader applicability: Insights and techniques developed here can extend to related areas such as misinformation detection, analysis of corporate disclosures, and computational analysis of discourse more generally.
8. From reactive to proactive monitoring: Allows for ongoing, real time tracking of claims rather than depending on investigative reporting or legal action after the fact to catch greenwashing.
9. Informing policy: Offers regulators and rating agencies evidence to build more effective monitoring systems and disclosure requirements.

Review of Literature:

1. Delmas and Burbano explain that greenwashing is not just a deliberate act by

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firms but arises from a mix of external pressures, organizational factors, and individual managerial decisions. External pressures include regulatory gaps, consumer and investor expectations, and competition. Inside organizations, culture, incentives, and governance quality can promote misleading environmental claims. Managers' personal biases also play a role in how environmental information is presented. The authors highlight that greenwashing occurs when companies feel pressured to appear eco-friendly while their claims are hard to verify. They recommend steps for regulators, managers, and NGOs to mitigate these issues. This framework has influenced later research, including AI methods that detect greenwashing by spotting selective disclosures and inconsistencies in environmental reports.

2. Lyon and Montgomery synthesize a fragmented literature into a unified account of greenwash: communication that leads audiences to form an unduly favorable impression of environmental performance. They show greenwash is an umbrella term covering distinct strategies selective disclosure, symbolic rather than substantive action, and vague, unverifiable claims rather than one uniform behavior. This typology matters for detection research because it implies no single heuristic can capture all forms. Later LLM-based work directly operationalizes the selective disclosure mechanism they identify, treating gaps between disclosed and omitted information as a measurable greenwashing signal.
3. Calamai et al. review NLP-based methods for detecting greenwashing, focusing on identifying climate-related content, classifying environmental claims, and detecting misleading statements. They note a shift from keyword-based methods to transformer models, which better identify vague or indirect language. However, limited high-quality datasets and inconsistent annotations remain major challenges. The authors recommend reliable, independently verified labels and interpretable models that support human review rather than fully automated judgments.
4. Selective Silence as a Signal (2025) LLM Based Issue Level Detection This 2025 study identifies greenwashing through "selective silence," where companies highlight positive ESG information while leaving out negative incidents. Using an LLM based retrieval system, the researchers develop a Greenwashing Index covering 28 ESG issues by comparing company disclosures with independent controversy data. The findings show significant gaps between ESG claims and actual performance, highlighting selective disclosure as a useful indicator of greenwashing.
5. Evaluating Multimodal AI for Greenwashing Detection (2026) this 2026 study examines whether multimodal AI can identify greenwashing in the visual content of ESG reports. The researchers tested ChatGPT, Claude, and Gemini against

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independently verified sustainability scores from Polish reports. The results showed no consistent link between actual ESG performance and AI detected greenwashing, suggesting that these models still require further validation before being used for auditing. The study also highlights visual ESG communication as an overlooked area of greenwashing research.

Research Gap:

Previous research shows that AI and machine learning have considerable potential for identifying corporate greenwashing in ESG reports and other forms of communication. However, several limitations still exist. The absence of standardized and independently verified datasets makes it difficult to accurately compare different AI and ML models. Many existing systems also identify potentially misleading claims without clearly explaining the reasons behind their decisions. Furthermore, most studies focus on written disclosures, while visual content and non-English ESG communication receive comparatively less attention. This highlights the need for more reliable and transparent AI/ML approaches that can detect greenwashing across different types of corporate communication while allowing human experts to review the result.

Research Objective:

1. To examine the potential of Artificial Intelligence (AI) and Machine Learning (ML) in detecting corporate greenwashing.
2. To assess consumers' perceptions of the usefulness and effectiveness of AI in verifying environmental claims.
3. To evaluate the level of trust consumers place in AI-generated assessments of corporate environmental performance.
4. To examine consumer preferences regarding human oversight of AI-based greenwashing detection systems.
5. To identify the opportunities and limitations of using AI and ML as decision-support tools for detecting corporate greenwashing.

Research Methodology:

For this study, I used both primary and secondary data to explore how Artificial Intelligence and Machine Learning can help identify corporate greenwashing. The primary data was collected through a Google Forms survey, which focused on people's awareness, opinions, and level of trust in using AI to identify misleading environmental claims. For the secondary data, I referred to research papers and existing studies related to AI, Machine Learning, NLP, ESG reporting, and greenwashing. As AI-based greenwashing detection is still an emerging area, combining survey responses with findings from previous research helped provide a broader understanding of its potential, usefulness, and current limitations.

Primary Data:

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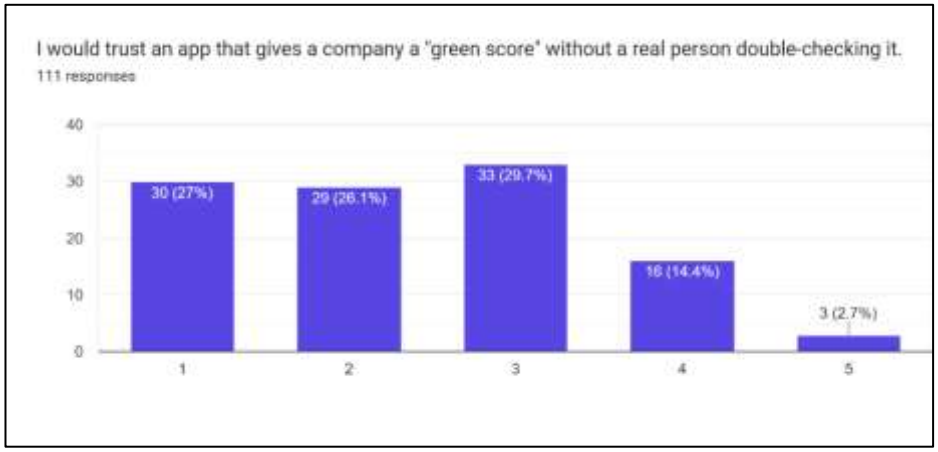
Primary data was collected through a Google Forms survey to understand consumer trust in AI for greenwashing detection, their ability to identify misleading green claims, and the importance of human oversight. The survey was shared through



WhatsApp, Instagram, and other social media platforms and remained open for two days, receiving 111 valid responses.

Most respondents were aged 18–22, including students and young professionals from commerce, technology, and arts. The responses were collected anonymously and analyzed using Google Sheets. The findings showed mixed opinions: while some respondents trusted AI to detect greenwashing, others preferred human involvement. Overall, the results suggest that consumers see AI as a useful tool, but human oversight remains important for building trust and ensuring accurate decisions.

Secondary Data:

Secondary data was collected from research papers, academic journals, industry reports, company websites, and reliable online sources related to AI, greenwashing, consumer trust, and human oversight. The information was used to understand how AI can identify misleading environmental claims and how consumers respond to AI-based decisions. Existing studies suggest that AI can improve the detection of greenwashing by analyzing large amounts of marketing and sustainability information. However, concerns about accuracy, transparency, bias, and lack of human judgment remain. Therefore, secondary research supports the importance of combining AI technology with human oversight to improve consumer trust and the effectiveness of greenwashing detection.

Findings of the Study:

1. "AI could help check if environmental claims are true" 47% agree, 25% neutral, 25% disagree

    a. Responses skew positive but aren't overwhelming: only 17% strongly agree (rated 5), while the largest single group (28%) sits neutral (3).

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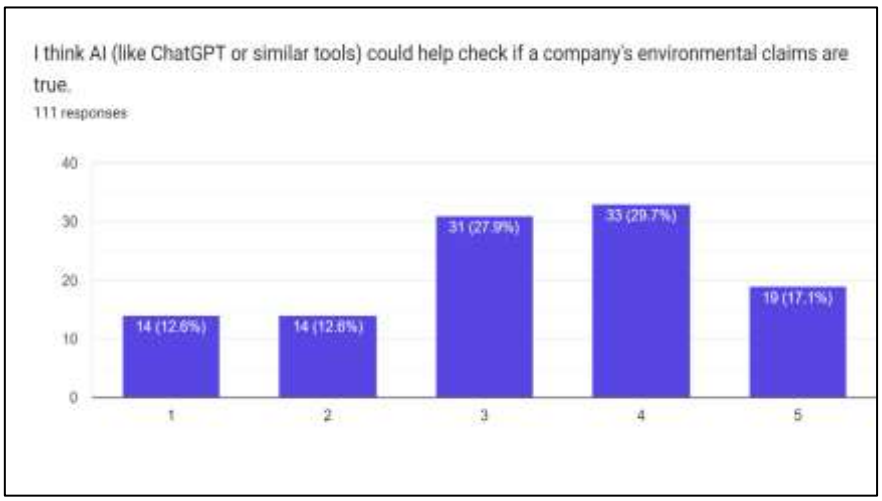
b. Suggests cautious optimism rather than confident belief — respondents see potential in AI, but aren't fully convinced yet, possibly due to low familiarity with how such tools would actually work.

2. "I would trust an app that gives a 'green score' without a human double-checking it" 53% disagree, 17% agree

a. More than half actively distrust a fully autonomous AI score
b. Very few (2.7%) strongly trust it almost no one is comfortable with AI having the final, unchecked word on a company's sustainability rating.



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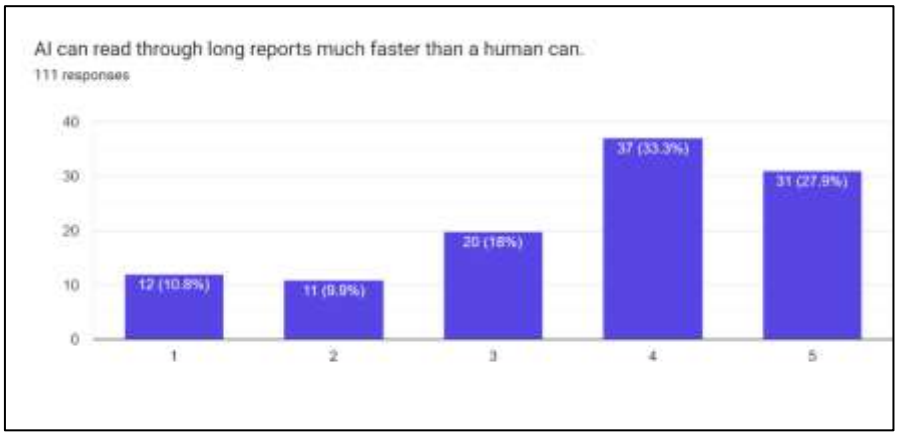
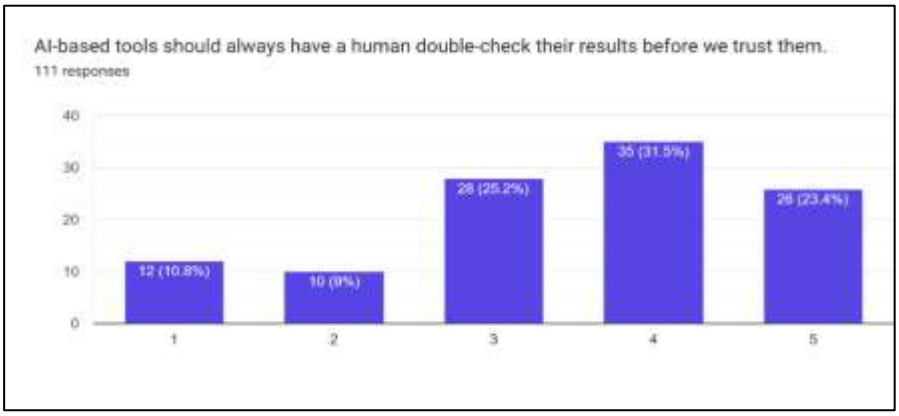
3. . "AI can read long reports faster than a human" — 61% agree, only 21% disagree



   a. The strongest, most one-sided result in the set respondents are highly confident in AI's processing/efficiency capability specifically.
   b. This is a purely functional/technical belief (speed), distinct from trust in AI's judgment — which is where the numbers drop sharply

4. ."I would trust an app that gives a 'green score' without a human double-checking it" (repeated question) — 50% disagree, 22% agree



   a. Nearly identical distribution to the first version of this question, reinforcing that the distrust in autonomous scoring is a stable, repeatable finding — not a one-off or wording artifact.
   b. Slight uptick in agreement (22% vs 17%) is within normal survey noise, not a meaningful shift.

5. The inverse of findings #2/#4, and consistent with them: respondents don't reject AI outright, they AI tools should always have a human double-check results" —

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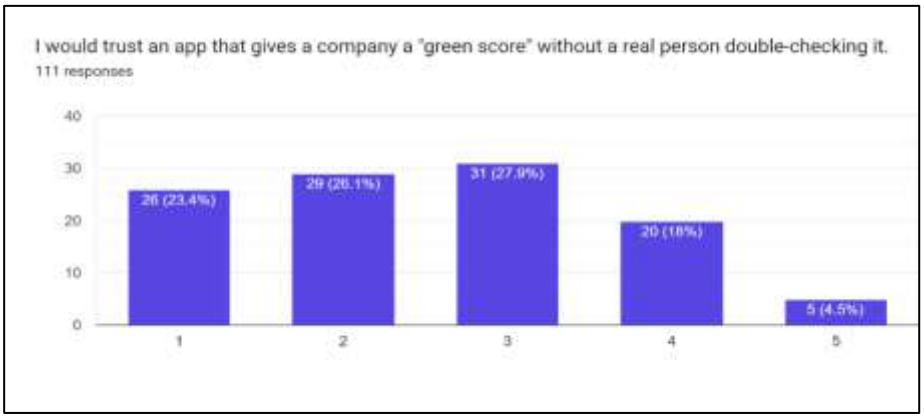
55% agree, only 20% disagree



a. reject unsupervised AI.

b. Together, these three findings (2, 4, 5) form the paper's clearest and most defensible narrative: people are open to AI as an assistive/first-pass tool, but overwhelmingly want a human-in-the-loop before trusting its Conclusions.

Data Analysis:

1. Statistical analysis (n = 111, 5-point Likert scale, tested against neutral midpoint = 3 using one-sample t-tests, plus correlations).

Question	Mean	SD	Median
Q1: AI could help verify claims	3.26	1.25	3
Q2: Trust autonomous "green score"	2.40	1.11	2
Q3: AI reads reports faster	3.58	1.29	4
Q4: Trust autonomous "green score" (repeat)	2.54	1.17	3
Q5: Want human double-check	3.48	1.25	4

2. Hypothesis testing

   One-sample t-test vs. neutral = 3

Ques -tion	H_0	H_1	t	p	Result
Q1	Mean = 3 (no belief AI helps)	Mean ≠ 3	2.20	0.030	Reject H_0 ,mean significantly above 3
Q2	Mean = 3 (neutral trust)	Mean ≠ 3	−5.71	<0.001	Reject H_0 , mean significantly below 3 (distrust)
Q3	Mean = 3	Mean ≠ 3	4.71	<0.001	Reject H_0 , mean significantly above 3
Q4	Mean = 3	Mean ≠ 3	−4.15	<0.001	Reject H_0 , mean significantly below 3 (distrust)
Q5	Mean = 3	Mean ≠ 3	4.03	<0.001	Reject H_0 ,mean significantly above 3

The survey results (n = 111) show that respondents generally view AI as a useful

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tool for detecting greenwashing. They agreed that AI can process information faster than humans ($M = 3.58$, $p < .001$) and can help verify environmental claims ($M = 3.26$, $p = .030$). These views were strongly correlated ($r = 0.572$, $p < .001$), suggesting that perceived efficiency contributes to AI's perceived usefulness.

However, respondents were less comfortable with AI making decisions independently. They significantly disagreed with relying on an unsupervised AI-generated "green score" ($M = 2.40–2.54$, $p < .001$), with similar responses when the question was repeated ($p = .187$). Support for human oversight was also significant ($M = 3.48$, $p < .001$). Overall, the findings suggest that consumers see AI as a supporting tool rather than an autonomous decision-maker, favouring a human-in-the-loop approach to greenwashing detection.

Limitations of the Study:

1. Sample and reach: The survey drew 111 valid responses over a two-day window through informal social channels (WhatsApp, Instagram), so the sample is skewed toward 18–22-year-old students and young professionals and may not represent broader consumer opinion across age groups, income levels, or regions.
2. Self-reported attitudes: The findings capture stated trust and opinion rather than observed behaviour, so respondents' answers about relying on an AI "green score" may not match how they would actually act when faced with a real purchase or investment decision.
3. No technical benchmarking: The study reviews literature on AI/ML detection models but does not itself build or test a greenwashing-detection system, so it cannot independently verify the accuracy claims reported in the secondary sources.
4. Single-country, English-language focus: Both the survey and most reviewed literature centre on English-language disclosures, leaving cross-cultural and multilingual greenwashing detection largely unexamined.

Suggestions and Recommendations:

1. Design detection tools as decision-support systems, not verdicts surfacing a risk score with the supporting evidence and an easy escalation path to a human reviewer, rather than a single unexplained "green score."
2. Invest in explainability: models should cite the specific claim, data point, or omission that triggered a flag, since respondents' distrust of "black-box" scoring was one of the strongest findings of this study.
3. Build independently verified, sector-specific datasets so different AI/ML models can be benchmarked on a common, trustworthy standard rather than proprietary or inconsistently labelled data.

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4. Extend future research to larger, more demographically varied samples, multimodal (visual) and multilingual claims, and controlled experiments that compare stated trust with actual reliance on AI outputs.
5. Regulators and platforms should treat AI flags as a starting point for investigation, not a final ruling, keeping a qualified human in the approval loop for any claim that affects consumer or investor decisions.

Conclusion:

This study set out to examine whether Artificial Intelligence and Machine Learning can meaningfully support the detection of corporate greenwashing, and how much consumers are willing to trust such systems. The literature review shows that NLP, LLM, and RAG-based approaches have advanced considerably, moving from simple keyword classifiers to models capable of identifying vague language, selective disclosure, and even "selective silence" in corporate reporting. Yet these technical gains have outpaced empirical understanding of user trust a gap this study was designed to address.

The primary survey data (n = 111) confirms a consistent and statistically significant pattern: young, digitally active consumers acknowledge AI's speed and processing power, and are cautiously optimistic that it can help verify environmental claims, but they firmly reject the idea of an unsupervised AI "green score" and strongly favour mandatory human double-checking. This pairing of functional confidence with judgment-level caution held up across two independently worded questions, indicating it is a stable attitude rather than a survey artefact.

Taken together, the technical review and the survey findings point to the same conclusion: AI and ML are best positioned as decision-support tools that flag risk, surface evidence, and accelerate review not as autonomous arbiters of corporate sustainability claims. A human-in-the-loop model, in which AI does the heavy lifting of scanning and pattern-detection while trained reviewers retain final judgment, is both what the technology currently supports and what consumers say they want. For regulators, platforms, and companies building these tools, the practical implication is clear: transparency, explainability, and a visible human checkpoint are not optional extras but preconditions for consumer trust and, ultimately, for the credibility of AI-assisted greenwashing detection itself.

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(ISSN – 2581-5830)
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TOWARDS A SUSTAINABLE FUTURE: A STUDY ON CIRCULAR ECONOMY AND CONSUMER BEHAVIOUR

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Abstract:
The Circular Economy is a sustainable economic model that focuses on reducing waste, conserving resources, and keeping products and materials in use for as long as possible. Unlike the traditional linear economy, which follows a "take–make–use–dispose" approach, the Circular Economy promotes reducing, reusing, repairing, refurbishing, remanufacturing, and recycling resources. It provides businesses with an opportunity to reduce resource dependence, improve efficiency, minimise waste, and create long-term economic and environmental value.
The purpose of this research paper is to study the concept of the Circular Economy and its application in business practices. The study examines its key principles, benefits, challenges, and the role of businesses in adopting circular business models. It also explores practices such as sustainable product design, resource recovery, recycling, repair, material substitution, and the use of technology and Artificial Intelligence. The study highlights how businesses can move beyond the traditional linear model and contribute to a more resource-efficient, innovative, and sustainable economy.

Introduction:

The traditional linear economy follows a *"take–make–use–dispose"* model, where businesses extract raw materials, manufacture products, sell them and eventually generate waste. This increases pressure on natural resources and contributes to pollution and resource scarcity.

The Circular Economy (CE) provides an alternative by keeping products and materials in use for as long as possible. It promotes reducing, reusing, repairing, refurbishing, remanufacturing and recycling, with the aim of reducing waste and retaining the value of resources.

Businesses play a crucial role in this transition by adopting sustainable product design, take-back systems, recycled materials, repair and refurbishment, resource recovery and technologies such as AI. Dell Technologies contributes through e-waste recycling, take-back initiatives and material recovery, while H&M promotes garment collection, reuse, recycling and the use of recycled materials. These examples show how businesses can integrate circular practices into their operations while reducing

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waste, conserving resources and creating long-term economic and environmental value.

Review of Literature:

Several researchers have highlighted the importance of the circular economy in promoting sustainability.

The Ellen MacArthur Foundation (2013) explained that the circular economy focuses on reducing waste by reusing, repairing, and recycling products and materials.

Geissdoerfer et al. (2017) stated that the circular economy supports economic growth while protecting the environment through efficient use of resources.

Kirchherr, Reike, and Hekkert (2017) emphasized that the circular economy replaces the traditional linear model with sustainable production and consumption practices.

Overall, previous studies suggest that adopting circular economy principles can help conserve resources, reduce pollution, and support sustainable development.

Objectives of the Study:

The objectives of this research paper are:

1. To study the concept and significance of Circular Economy in businesses.
2. To examine the benefits and challenges of adopting Circular Economy practices.
3. To analyse the role of innovation and technology in promoting circular business models.
4. To suggest practical strategies for businesses to reduce waste, conserve resources and achieve sustainable growth.

Research Hypothesis:

H_0 (Null Hypothesis):

There is no significant relationship between consumer awareness and the adoption of Circular Economy practices.

H_1 (Alternative Hypothesis):

There is a significant relationship between consumer awareness and the adoption of Circular Economy practices.

Research Methodology:

This study follows a descriptive research design to understand the concept, importance, benefits, and challenges of the circular economy.

The research is based on both primary and secondary data.

1) **Method of Data Collection**
   a) **Primary data** was collected through a structured questionnaire using Google Forms. The survey was conducted among students and the general public to understand their awareness and opinions regarding the circular economy and sustainable practices.
   Survey Link: *https://forms.gle/UBgyHSUqJGu185DW7*

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b) **Secondary data** was collected from research papers, academic journals, books, government reports, official websites, and publications by organizations such as the Ellen MacArthur Foundation and the United Nations Environment Programme (UNEP).

2) **Method of Data Analysis**: The collected data was analyzed using simple tools such as percentages and charts to draw meaningful conclusions and support the findings of the study.

3) **Sample Size:**

The study consisted of 50 participants, including 40 respondents who completed an online questionnaire and 10 individuals who participated in offline interactions. Most respondents belonged to the 18–25 years age group.

4) Limitations of the Study:

This study has certain limitations. Due to time constraints, an in-depth statistical analysis could not be conducted. The research was based on a relatively small sample size of 50 participants, with most respondents belonging to the 18–25 years age group, which may limit the generalizability of the findings. Additionally, the study relied on self-reported responses, which may be influenced by personal perceptions or response bias. Future research can overcome these limitations by using a larger and more diverse sample and applying advanced statistical techniques to provide more comprehensive insights into consumer behaviour and the adoption of Circular Economy practices.

5) Findings of the Study:

Chart 1:1

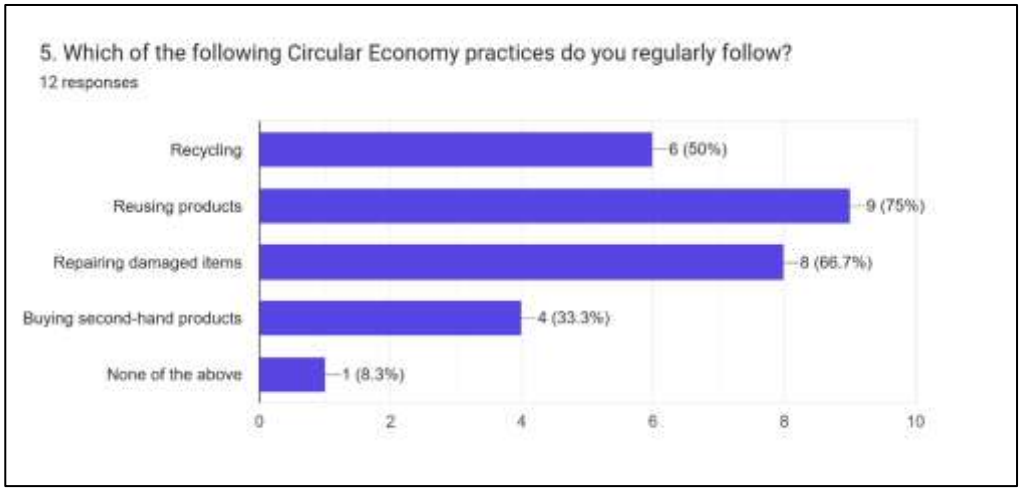

Chart 1:2

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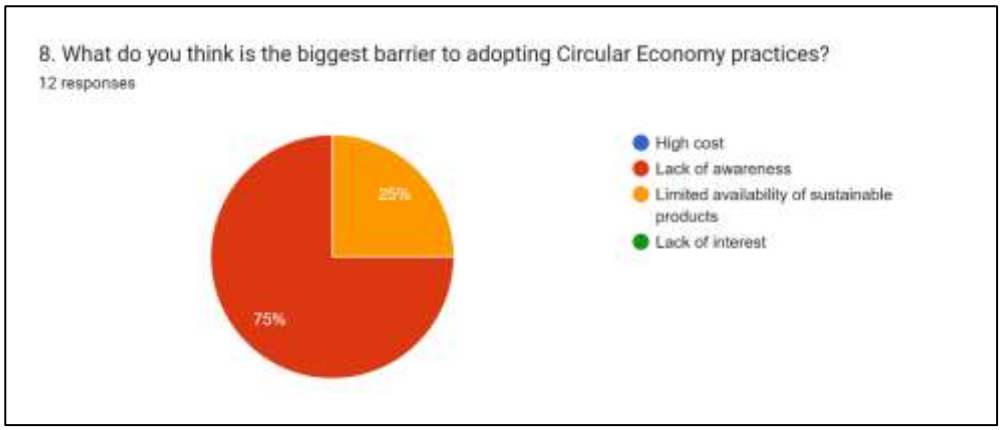

Findings & Analysis:

- Sample: 40 survey respondents + 10 offline interactions, mainly aged 18–25.
- Awareness: Only 52.5% knew about Circular Economy.
- Practices: 30% recycle, 57.5% reuse, and only 15% buy second-hand products.
- Consumer demand: 55% are willing to buy sustainable products if quality remains the same.
- Key barriers: Lack of awareness and perceived higher cost of sustainable products.
- Business insight: Businesses can turn this opportunity into action through quality sustainable products, affordable circular solutions, product redesign, recycling, repair and resource recovery.
- Overall finding: There is consumer interest but an awareness and implementation gap, giving businesses an opportunity to lead the transition to a Circular Economy.

Suggestions:

1. AI & Technology – Use AI for smart waste sorting, demand forecasting, resource tracking and efficient recycling.
2. Sustainable Product Design – Design products to be durable, repairable, reusable and easy to disassemble, with suitable material alternatives.
3. Resource Recovery & Reuse – Introduce take-back, repair, refurbishment and recycling systems to recover valuable materials and keep them in circulation.

Conclusion:

The Circular Economy is not just an environmental concept but a business opportunity to create long-term value while using resources responsibly. It can help businesses reduce waste, improve resource efficiency, manage resource scarcity and encourage innovation.

For successful adoption, businesses need to move beyond the traditional *"take–make–use–dispose"* model and incorporate reuse, repair, recycling, resource

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recovery, sustainable product design and technological solutions such as AI into their practices. Consumer awareness and supportive policies can further strengthen this transition.

Ultimately, the Circular Economy requires a change in both business practices and mindset. Businesses must focus not only on producing and selling more, but on creating more value from the resources they already have. The opportunity to make this transition exists today, and businesses have a key role in shaping a more sustainable future.

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Impact Factor – SJIF – 4.998, IIFS - 4.375
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GENERATION Z'S PREFERENCES TOWARDS SUSTAINABLE ENTREPRENEURSHIP: A STUDY OF UNDERGRADUATE STUDENTS IN MUMBAI

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Abstract:
The present study focuses on understanding the preferences of undergraduate students of Mumbai regarding sustainable entrepreneurship. Sustainable entrepreneurship encompasses businesses that prioritize environmental and social responsibility alongside profitability. The study aims to determine students' awareness of sustainable businesses, their preference for eco-friendly products, their willingness to support sustainable start-ups in the future, and their interest in launching their own sustainable ventures.
Primary data was collected from 100 undergraduate students using Google Forms. The research is descriptive in nature, and the responses were analyzed using percentage methods and pie charts. The findings reveal that 78% of respondents were aware of sustainable or eco-friendly businesses. Though 85% of the respondents prefer to buy eco-friendly products and 72 % intend to support sustainable start-ups in the future, but only 42% respondents agree that they would consider launching their own sustainable business in the future. This indicates that while awareness and support for sustainability are relatively strong amongst students, practical guidance, training, and support are required to translate this awareness into actual entrepreneurship. The research suggests measures such as college-level workshops, practical start-up guidance, social media awareness campaigns, and entrepreneurship support systems to promote sustainable entrepreneurship.

Introduction:

Sustainable entrepreneurship refers to the process of creating and developing businesses that aim to generate economic value while also considering their impact on society and the environment. Unlike businesses that focus mainly on financial returns, sustainable businesses try to balance profit, people and the planet. This can include producing eco-friendly products, reducing waste, using resources responsibly, adopting renewable energy, promoting ethical practices and developing solutions to environmental or social problems. With increasing concerns about

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climate change, pollution and resource depletion, sustainable entrepreneurship has become an important area of business and entrepreneurship.

Gen Z generally refers to people born from the mid-1990s to the early 2010s, although the exact years may vary across different studies. India has one of the world's largest Gen Z populations, making this generation important as both consumers and potential entrepreneurs. Therefore, the preferences of Gen Z can have a significant influence on future businesses.

Need for the present Study:

Young consumers may increasingly consider factors such as eco-friendly products, ethical practices and the social impact of businesses while making purchasing decisions. At the same time, there may be a difference between supporting sustainable businesses as consumers and actually being willing to start a sustainable business.

This creates the **need for the present study**. Although awareness of sustainability is increasing, it is important to understand whether this awareness is reflected in the actual preferences and entrepreneurial intentions of today's generation. The current research looks at how undergraduate students understand sustainable start-ups, their preference for eco-friendly products, their desire to support sustainable start-ups and their interest in starting sustainable businesses. The findings can help educational institutions, businesses and policymakers develop suitable awareness programmes, practical training and support systems to encourage greater participation in sustainable entrepreneurship.

Review of Literature:

Papp-Váry, **Pacsi and Szabó (2023)** A study was conducted on the views of Generation Z university students regarding entrepreneurship and sustainability. The research involved an online survey of 280 Hungarian university students as well as focus group discussions. The primary focus of the study was to understand what motivates Generation Z to start a business or startup and to gauge their perspective on sustainability. The findings suggest that encouraging young people to pursue green and sustainable businesses could foster the growth of environmentally friendly startups in the future.

Lopes, Gomes and Trancoso (2024)A study was conducted on the sustainable entrepreneurial behavior of Generation Z, involving 505 Portuguese youths from this generation. The findings revealed that creativity, a proactive nature, and sustainable thinking positively influence the intention to start a sustainable business. The study also highlighted the significant role that risk perception plays in sustainable entrepreneurship.

Bulu et al. (2026) A study was conducted on green entrepreneurship among Generation Z. It identified a lack of awareness regarding environmentally friendly

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businesses as one of the reasons for the low interest in green entrepreneurship among students. The research involved a survey of 150 students. The findings revealed that entrepreneurship education and university support have a positive impact on students' interest in green entrepreneurship; however, entrepreneurial self-efficacy was not found to have a significant effect. The study also suggested that universities should incorporate environmental topics into entrepreneurship courses and provide students with mentoring, funding, and practical experience to foster greater interest in sustainable and green businesses.

Fathima and Ambreen (2026) sustainable entrepreneurship refers to business ventures that are eco-friendly and environmentally conscious. In this context, business owners do not focus solely on growth and profit but also attach importance to society and the environment. The study indicates that Generation Z is comparatively more inclined towards sustainability. Generation Z—also known as "Zoomers"—generally refers to the generation born during the late 1990s and early 2000s.

Research Methodology:

1. Objectives of the Study:

- To determine the awareness of sustainable businesses among Generation Z.
- To understand the preferences of Generation Z towards sustainable and eco-friendly products.
- To examine the willingness of Generation Z to support sustainable start-ups in the future.
- To assess the interest of Generation Z in starting their own sustainable businesses.

2. Research Design

The research is descriptive in nature.

The study examines students' preferences, awareness, and opinions.

Data was collected through a survey.

3. Data Collection Methods

Method:

Primary data

Online questionnaire and google form

Population of the Study:

Undergraduate college students from Mumbai

Sample Size:

100 respondents

Sampling Method:

Convenience sampling

4. Data Analysis Techniques

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Students' responses were analyzed from google form.

The data was studied by using the percentage method, mean score

The responses were presented through pie charts

5. Scope of the Study

- The study focuses on Generation Z undergraduate students in Mumbai.
- Awareness of and preference for sustainable businesses were examined.
- Purchasing behavior regarding eco-friendly products was covered.
- Interest in supporting or launching sustainable start-ups in the future was studied.

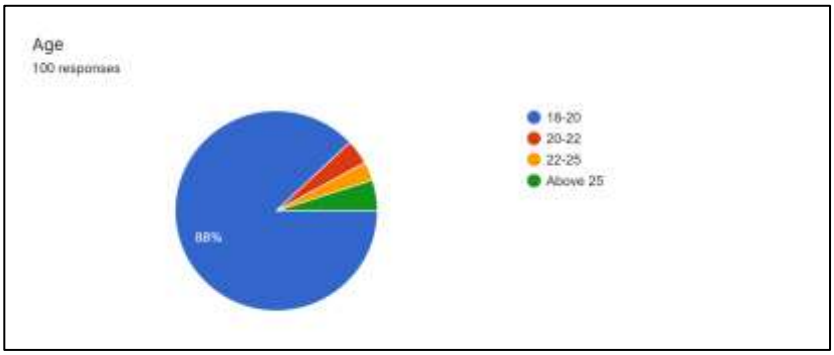
6. Limitations of the Study

- The study is limited to just 100 respondents.
- Responses were primarily collected from undergraduate students in Mumbai.
- The data is based on the respondents' personal opinions.
- There was limited time available for the survey.
- The results cannot be directly applied to the entire Generation Z population.

Data Analysis and Interpretation:

1. Respondent Profile

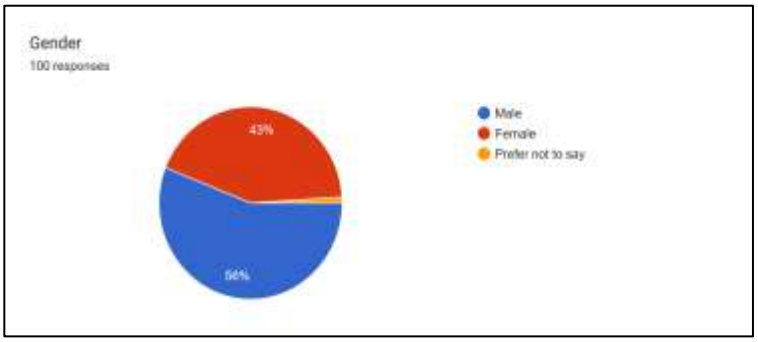
1.1 Age



A total of **100** responses were received in the survey.

88% of the respondents belong to the **18-20 age** group.

1.2 Gender



56% of the respondents are **male** and **43%** are **female.**

1.3 - Course

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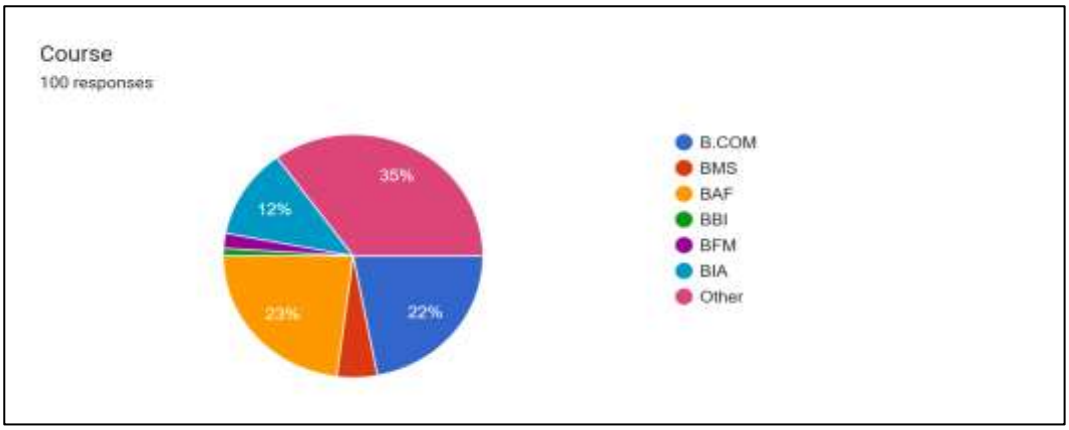
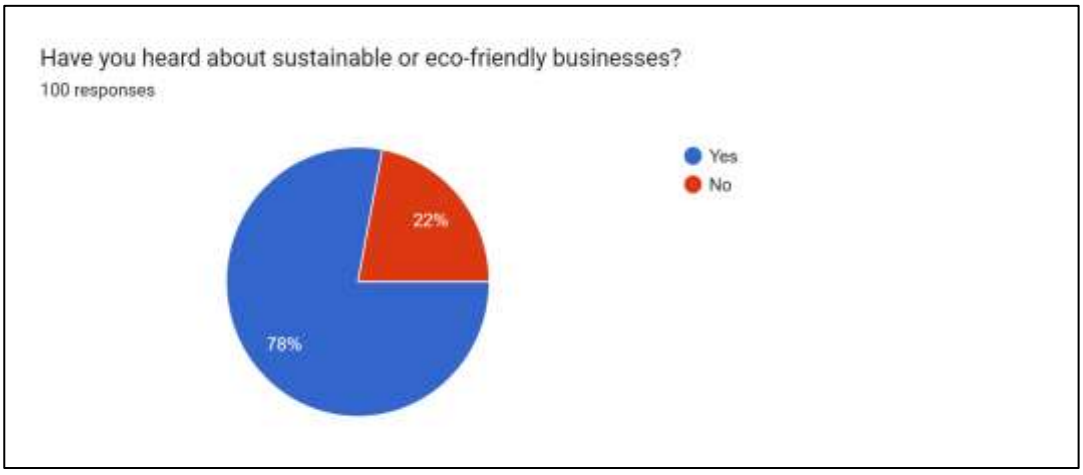


Students from various **undergraduate courses participated.**

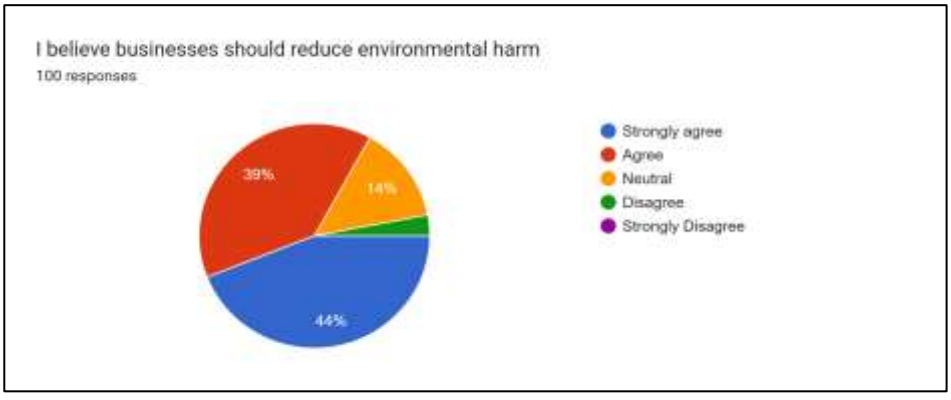
1.4 - Awareness about sustainable business



78% of the respondents stated that they have heard about **sustainable** or **eco-friendly businesses.**

2. Preference Towards Sustainable Businesses

2.1 Environmental Responsibility



44% strongly agree and **39%** agree that businesses should reduce environmental harm. This indicates that students view environmental responsibility positively.

2.2 Eco-friendly Products

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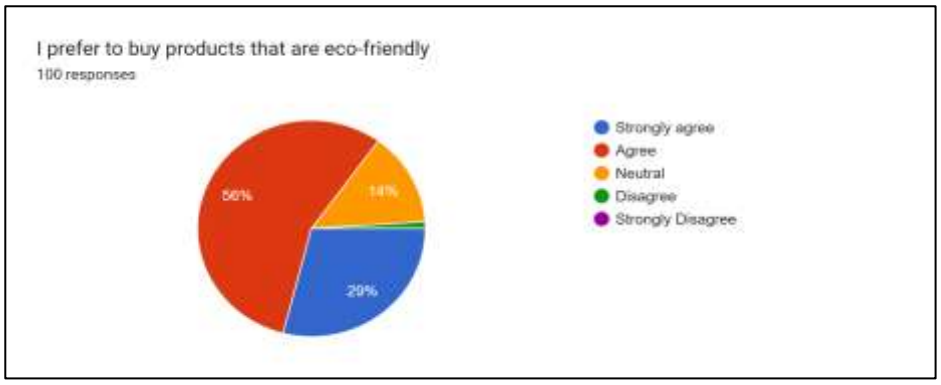
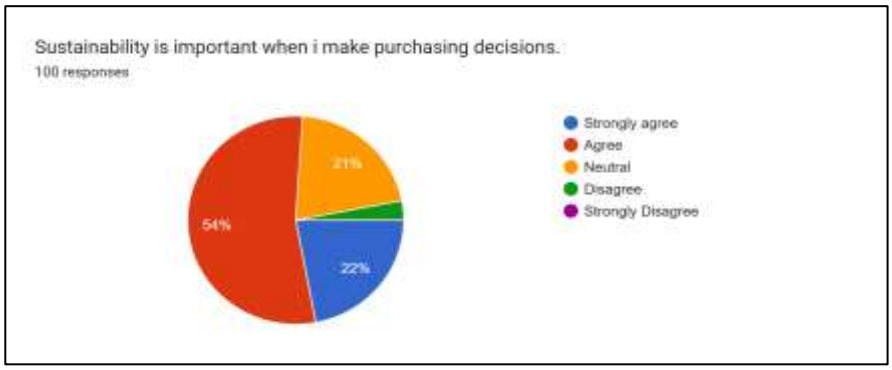


56% agree and **29%** strongly agree that they prefer eco-friendly products. Overall preference is quite positive. Sustainability in purchasing.

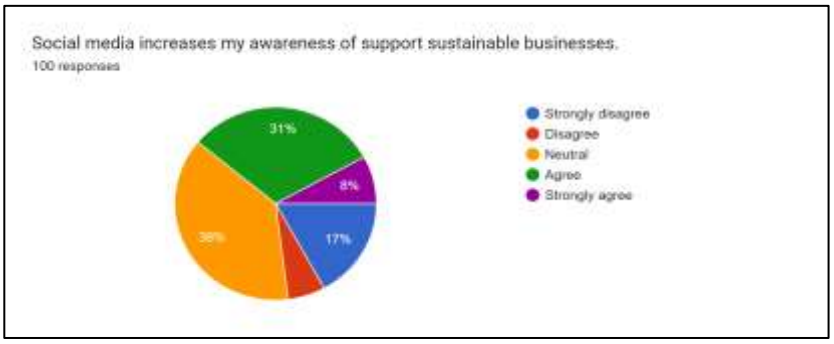
2.3 Sustainability in Purchasing Decision



54% agree and **22%** strongly agree that sustainability is important in purchasing decisions. This demonstrates the influence of sustainability on buying behavior.

3. Influence of Social Media and Online Reviews

3.1 Social Media



38% of the respondents remained neutral. **31%** agree and **8%** strongly agree that social media raises awareness about supporting sustainable businesses. This implies that social media has an influence, but not all students strongly agree with it.

3.2 Online Reviews

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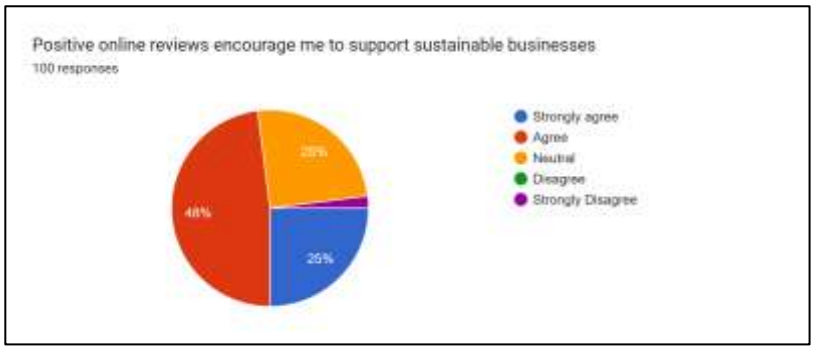
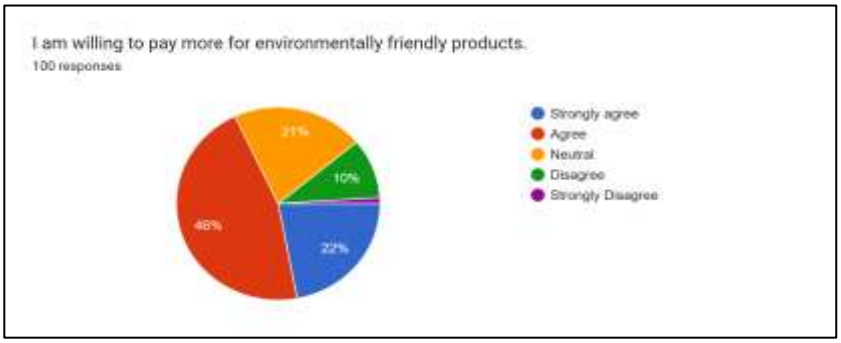


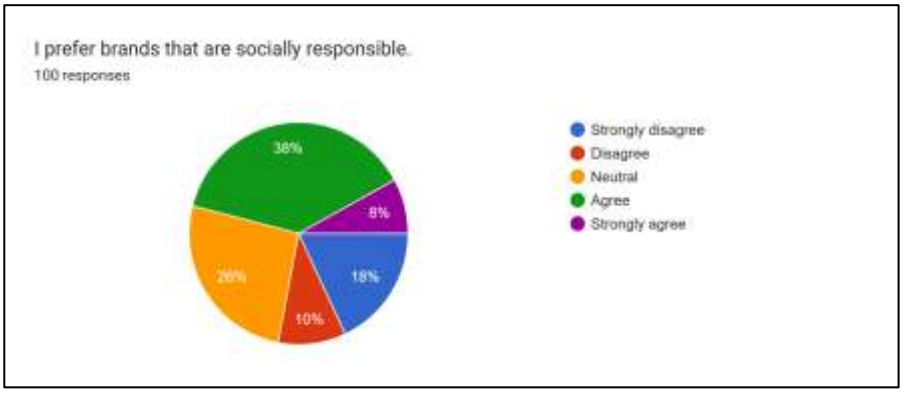
48% agree and **25%** strongly agree that positive online reviews encourage support for sustainable businesses. Online reviews can play an important role in purchasing and support decisions.

3.3 Willingness to Pay More for Eco-Friendly Products



46% of respondents agree that they are willing to pay more for environmentally friendly products. **22%** strongly agree and **21%** are neutral. This indicates a positive market opportunity for sustainable start-ups. However, price will also remain an important factor,as **21%** of respondents are currently neutral.

4. Preference towards Social Responsibility



38% agree and **8%** strongly agree that socially responsible brands are preferred.

26% of respondents remained neutral. This indicates a preference for social responsibility, though a significant number of respondents remain neutral.

5. Future Support for Sustainable Start-ups

5.1 Supporting Sustainable Start-ups

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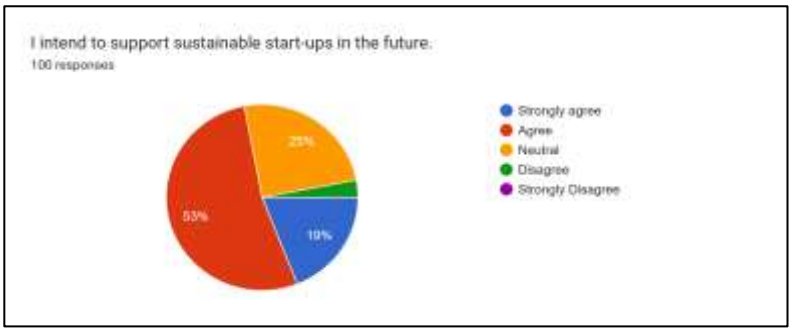
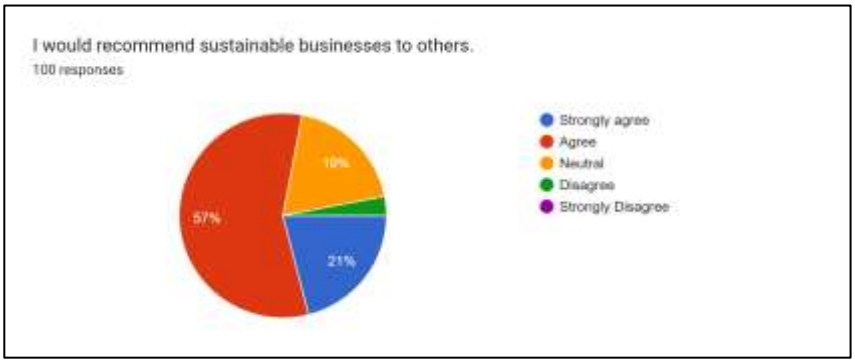


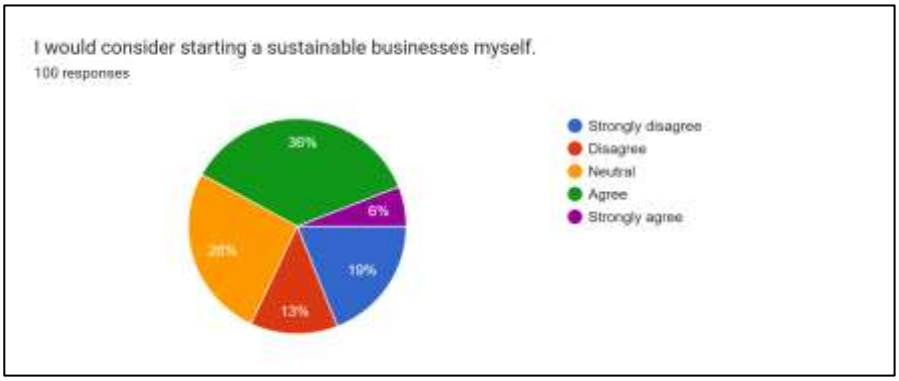
53% agree and **19%** strongly agree that they will support sustainable start-ups in the future. Only a small percentage expressed disagreement. This indicates a positive future preference for sustainable start-ups.

5.2 Recommending Sustainable Businesses



57% agree and **21%** strongly agree that they would recommend sustainable businesses to others. This indicates a positive scope for word-of-mouth support.

6. Interest in Starting a Sustainable Businesses



36% agree and **6%** strongly agree that they would consider starting a sustainable business themselves. **26%** are neutral and **32%** of respondents disagree or strongly disagree. This indicates a strong preference for supporting sustainable businesses, but comparatively less confidence or interest in starting one personally.

Findings, Conclusion and Recommendations:

Key Findings:

No.	Statement	Mean Score	Agree + Strongly Agree

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1	I believe businesses should reduce environmental harm.	4.24	83%
2	I prefer to buy products that are eco-friendly.	4.13	85%
3	I would recommend sustainable businesses to others.	3.96	78%
4	Sustainability is important when I make purchasing decisions.	3.95	76%
5	Positive online reviews encourage me to support sustainable businesses.	3.94	73%
6	I intend to support sustainable start-ups in the future.	3.88	72%
7	I am willing to pay more for environmentally friendly products.	3.78	68%
8	I prefer brands that are socially responsible.	3.08	46%
9	Social media increases my awareness/support for sustainable businesses.	3.07	39%
10	I would consider starting a sustainable business myself.	2.97	42%

From the above table, it is clear:

1. 78% of respondents had heard about sustainable or eco-friendly businesses.
2. The strongest response was the belief that businesses should reduce environmental harm (mean = 4.24).
3. 85% preferred to buy eco-friendly products (mean = 4.13).
4. 78% would recommend sustainable businesses to others (mean = 3.96) and 76% considered sustainability important in purchasing decisions (mean = 3.95).
6. 72% intended to support sustainable start-ups in the future (mean = 3.88).
7. 68% were willing to pay more for environmentally friendly products (mean = 3.78).
8. Social responsibility and social-media influence received relatively moderate scores (means = 3.08 and 3.07).
9. **Only 42% agreed or strongly agreed that they would consider starting a sustainable business (mean = 2.97).**
10. The overall findings suggest a clear attitude–action gap between supporting sustainable businesses and personally becoming a sustainable entrepreneur.

Conclusion:

This study was carried out to understand how the present generation views sustainable entrepreneurship and sustainable businesses. The responses collected from 100 participants show that there is a generally positive attitude towards

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sustainability. Most respondents agreed that businesses should take responsibility for reducing environmental harm, and they also showed a strong preference for eco-friendly products.

The responses also indicate that people are willing to support sustainable businesses in different ways. Many participants said that they would recommend sustainable businesses to others, support sustainable start-ups in the future, and take sustainability into account while making purchasing decisions. These findings suggest that there is a positive market environment for businesses that offer sustainable products and services.

At the same time, the study brings out an important difference between supporting sustainable businesses and actually starting one. The statement related to personally starting a sustainable business received the lowest mean score of 2.97. This shows that although respondents appreciate and are willing to support sustainable businesses, relatively fewer of them are ready to take the step of becoming sustainable entrepreneurs themselves.

Overall, the findings suggest that the present generation is becoming more aware of sustainability and is generally open to sustainable products and businesses.

However, positive attitudes alone may not be enough to encourage people to start their own sustainable ventures. More practical education, entrepreneurial training, financial assistance, mentoring and institutional support could help young people gain the confidence and resources needed to turn their interest in sustainability into actual business initiatives.

Recommendations:

Based on the findings of the study, the following recommendations are made to encourage today's generation in starting their own sustainable ventures:

- Workshops on sustainable entrepreneurship can be conducted in colleges.
- Students can be provided with guidance on practical start-up ideas and business models.
- Social media can be used to raise awareness about sustainable businesses.
- Students should be given opportunities to start small-scale sustainable business projects.
- The government and educational institutions can provide entrepreneurship training and support.
- Colleges can invite successful sustainable entrepreneurs to interact with students and share their experiences.

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AWARENESS TO ACTION: ANALYZING CONSUMER ENGAGEMENT WITH GREEN PACKAGING IN E-COMMERCE

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Mr. Rishi Ash
Ghanshyamdas Saraf College of Arts & Commerce

Abstract:
This study explores the role of green packaging in e-commerce, focusing on consumer awareness, preferences, and purchase intentions. With the rise of online shopping, packaging has become critical not only for product protection but also for branding and sustainability. Using a mixed-method approach—Google Forms surveys and mini-interviews—the research investigates consumer perceptions of eco-friendly packaging, cost implications, and trust factors such as eco-labels and certifications. Findings highlight the balance between ecological responsibility and functional performance, emphasizing that green packaging is both an environmental necessity and a strategic business decision.

Introduction:

Packaging in e-commerce has evolved into a critical component of product delivery, branding, and sustainability. Unlike traditional retail, where customers interact directly with products, online shopping relies heavily on packaging as the first tangible point of contact between the consumer and the brand. It must withstand multiple stages of handling—sorting, warehousing, transportation, and doorstep delivery—while simultaneously shaping customer perceptions of quality, professionalism, and environmental responsibility.

Globally, the e-commerce packaging market was valued at approximately USD 92.4 billion in 2026, with projections indicating a compound annual growth rate (CAGR) of 11.2% through 2030. Corrugated boxes dominate the sector, accounting for nearly 52% of market share, while flexible packaging formats such as mailers and pouches are the fastest-growing segment, expanding at 14.8% CAGR. In India, the rapid penetration of online retail and government regulations on single-use plastics have accelerated the adoption of recyclable and biodegradable packaging solutions, positioning green packaging as both a necessity and a competitive differentiator.

Consumer behavior further underscores the importance of sustainable packaging. Surveys reveal that 72% of consumers express willingness to pay more for eco-friendly packaging, though actual purchase behavior reflects an "attitude-behavior gap," with only about 35% consistently choosing green-packaged products.

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Additionally, 50% of online shoppers prefer paper-based packaging over plastic, citing recyclability and environmental benefits. Personalized and branded packaging has also been shown to increase customer loyalty by nearly 30%, highlighting its dual role in sustainability and marketing.

From a cost perspective, packaging represents 3.5–6% of gross revenue for e-commerce businesses, with the median packaging cost per order estimated at USD 1.80. Eco-friendly alternatives typically cost 8–15% more than conventional materials, yet they offer long-term savings through reduced waste, fewer product returns, and enhanced brand reputation. Notably, e-commerce returns require three times more packaging than direct store sales, amplifying the environmental and financial implications of packaging choices.

Regulatory frameworks are also reshaping industry practices. Governments worldwide, including India, are tightening restrictions on single-use plastics and mandating waste management compliance. These policies, combined with rising consumer awareness, are compelling businesses to adopt green packaging strategies that align with sustainability goals while maintaining functionality and cost-effectiveness.

In summary, packaging in e-commerce is no longer a mere protective layer; it is a strategic tool that integrates product safety, branding, customer experience, and environmental responsibility. The statistical evidence demonstrates that green packaging is not only environmentally beneficial but also commercially viable, making it a cornerstone of modern e-commerce operations.

Review of Literature:

Smith, (2020) - The literature on green packaging in e-commerce highlights a significant transition from traditional packaging materials toward sustainable alternatives. Traditional packaging, such as plastic, cardboard, glass, and metal, has long been favored for its affordability and availability. However, scholars emphasize that these materials contribute heavily to environmental pollution and waste generation.

Johnson & Lee, (2021) - In contrast, green packaging incorporates recyclable, biodegradable, compostable, or reusable materials, thereby reducing ecological harm while supporting sustainability goals.

Kumar & Patel, (2022) - Several studies have examined the role of alternative materials in replacing conventional fillers like bubble wrap. For instance, honeycomb sheets, corrugated paper wrap, biodegradable foam peanuts, and paper void fill are increasingly recognized as effective substitutes that maintain product protection during transit while minimizing plastic use.

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Brown, (2019) these innovations not only reduce environmental impact but also enhance brand image, as consumers increasingly associate eco-friendly packaging with corporate responsibility.

Williams, (2021) Cost considerations remain a recurring theme in the literature. While traditional packaging is often cheaper upfront, green packaging provides long-term benefits by lowering waste, reducing product returns, and improving shipping efficiency.

(Chen & Gupta, 2020) Moreover, sustainable packaging aligns with evolving consumer expectations and regulatory frameworks, making it a strategic business decision rather than a purely environmental one.

Martinez, (2021) Researchers also highlight the psychological dimension of consumer behavior. Although many consumers express concern for the environment, the "attitude-behavior gap" persists, where stated preferences for eco-friendly products do not always translate into actual purchase decisions.

Singh & Mehta, (2022) Eco-labels, certification symbols, and material texture are identified as key factors that influence trust and bridge this gap.

Overall, the literature suggests that the adoption of green packaging in e-commerce is driven by a combination of environmental responsibility, consumer trust, regulatory compliance, and long-term cost-effectiveness. It is not merely a protective measure but a strategic tool that integrates sustainability with branding and customer experience.

Research Gap:

Although existing literature provides valuable insights into the transition from traditional packaging to sustainable alternatives, several gaps remain unaddressed. Most studies emphasize the environmental benefits of green packaging and its role in enhancing brand image, yet there is limited empirical research on the psychological triggers that convert consumer awareness into actual purchase behavior. The persistent "attitude–behavior gap" highlights that while consumers express concern for the environment, this does not consistently translate into choosing eco-friendly packaged products.

Another gap lies in the functional trade-offs associated with sustainable packaging. While researchers acknowledge that eco-friendly materials may be less durable or more costly, few studies systematically measure the threshold at which consumers prioritize convenience, product safety, or resealability over ecological responsibility. This leaves unanswered questions about how much compromise consumers are willing to accept before rejecting green alternatives.

Additionally, the literature often focuses on global trends but provides limited region-specific analysis, particularly in emerging markets such as India, where regulatory pressures and consumer expectations are rapidly evolving. There is insufficient

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exploration of how local cultural attitudes, purchasing power, and government policies influence adoption rates of green packaging in e-commerce.

Finally, while cost-effectiveness is frequently discussed, most studies examine it from a business perspective rather than integrating consumer willingness to pay into the analysis. The lack of comprehensive frameworks that combine environmental, functional, psychological, and economic dimensions creates a gap in understanding how businesses can strategically position green packaging to achieve both sustainability and profitability.

Objectives of the Study:

1. To examine consumer awareness and perceptions of green packaging in e-commerce.
2. To analyze the impact of eco-labels, certifications, and branding on consumer purchase intentions.
3. To evaluate consumer trade-offs between ecological responsibility and functional performance.
4. To assess the cost implications and willingness to pay for sustainable packaging.

Research Methodology:

This study adopts a mixed-method research design to comprehensively examine consumer awareness, preferences, and purchase intentions regarding green packaging in e-commerce. The methodology integrates both quantitative and qualitative approaches to ensure depth and reliability of findings.

1. Research Design

A descriptive and exploratory design was chosen to capture consumer perceptions and behavioral patterns. The quantitative component provided measurable insights into awareness levels and preferences, while the qualitative component offered deeper explanations of consumer attitudes and experiences.

2. Data Collection Methods

1. **Primary Data**
   - **Quantitative Survey:** A structured questionnaire was designed using Google Forms and distributed via WhatsApp, Instagram, email, and other online channels.
   - **Qualitative Interviews:** Semi-structured mini-interviews were conducted with selected respondents to explore their experiences with traditional and eco-friendly packaging.
2. **Secondary Data**
   - Literature from journals, reports, and industry publications was reviewed to contextualize findings and identify existing trends in sustainable packaging.

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3. Sampling Method

- **Technique:** Convenience sampling was employed due to ease of access and time constraints.
- **Population:** Online shoppers from diverse age groups and backgrounds.
- **Rationale:** While convenience sampling allowed quick data collection, it may limit generalizability since respondents were not randomly selected.

4. Research Instrument

- **Questionnaire:** Included multiple-choice, rating-scale, and open-ended questions. A five-point Likert scale was used to measure agreement levels on issues such as trust in eco-labels, willingness to pay more, and importance of packaging quality.
- **Interview Guide:** Focused on consumer understanding of green packaging, cost concerns, trust in brands, and suggestions for improvement.

5. Data Analysis

- **Quantitative Analysis:** Responses were tabulated and analyzed using simple statistical tools such as frequencies and percentages to identify trends in awareness, preferences, and willingness to pay.
- **Qualitative Analysis:** Interview transcripts were coded thematically, with recurring ideas grouped into categories such as environmental awareness, product protection, convenience, cost, and brand trust.
- **Triangulation:** Findings from surveys and interviews were compared to validate results and provide a holistic understanding.

6. Ethical Considerations

- Participation was voluntary, and respondents were informed about the purpose of the study.
- Confidentiality was maintained, with no sensitive personal information disclosed.
- Data collected was used strictly for academic purposes.

7. Limitations

- Convenience sampling may not fully represent the broader consumer population.
- Responses reflect stated opinions, which may differ from actual purchase behavior.
- Social desirability bias may have influenced answers, given the positive perception of environmental responsibility.

Data Analysis and Interpretation:

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The responses collected through questionnaires and mini-interviews were analyzed using simple statistical tools (frequencies and percentages) and thematic grouping. Below is a tabular representation of the key findings, followed by interpretation.

Data Analysis Table:

Factor	Survey Result (%)	Interpretation
Awareness of green packaging	68%	Majority of respondents are aware of eco-friendly packaging, but awareness is not universal.
Preference for eco-friendly materials	61%	Consumers show a clear preference for paper, cardboard, and biodegradable options over plastic.
Trust in eco-labels/certifications	54%	More than half trust eco-labels, but skepticism remains about authenticity of claims.
Willingness to pay higher price	47%	Nearly half are willing to pay more, indicating cost sensitivity but growing acceptance.
Importance of product protection	82%	Protection remains the top priority; sustainability is secondary if safety is compromised.
Influence of packaging on purchase decision	58%	Packaging plays a significant role in shaping purchase intent, especially when branded and eco-friendly.
Perception of brand image	65%	Green packaging improves brand trust and reputation among consumers.
Concern about reducing plastic waste	72%	Strong environmental concern exists, showing alignment with sustainability goals.

Interpretation:

1. **High Awareness but Moderate Adoption:** While 68% of respondents are aware of green packaging, only 61% actively prefer eco-friendly materials. This reflects the **attitude–behavior gap**, where awareness does not always translate into consistent action.
2. **Cost Sensitivity:** With 47% willing to pay more, consumers show cautious acceptance of higher prices for sustainable packaging. This suggests that **pricing strategies must balance affordability with eco-value** to encourage wider adoption.
3. **Trust in Eco-Labels:** Although 54% trust eco-labels and certifications, skepticism persists. This indicates the need for **transparent communication and credible certifications** to reassure consumers that packaging claims are genuine.
4. **Functional Priority:** Product protection (82%) is the most important factor, showing that consumers will not compromise safety for sustainability. Green packaging must therefore **match or exceed the durability of traditional materials** to gain acceptance.

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5. **Brand Image Enhancement:** With 65% linking eco-friendly packaging to better brand reputation, businesses can leverage sustainability as a **strategic differentiator** in competitive markets.
6. **Environmental Responsibility:** The strong concern (72%) about reducing plastic waste highlights that consumers are increasingly conscious of environmental issues, creating an opportunity for businesses to align with these values.

Findings and Conclusion:

Findings:

1. **Consumer Awareness:** A majority of respondents (68%) are aware of green packaging, but awareness does not always translate into consistent adoption.
2. **Preference for Eco-Friendly Materials:** 61% prefer paper, cardboard, or biodegradable packaging, showing a clear shift away from plastics.
3. **Trust in Eco-Labels:** 54% trust eco-labels and certifications, though skepticism remains about authenticity.
4. **Willingness to Pay:** 47% are willing to pay more for sustainable packaging, indicating cost sensitivity but growing acceptance.
5. **Functional Priority:** Product protection (82%) is the most important factor, meaning consumers will not compromise safety for sustainability.
6. **Brand Image:** 65% believe green packaging improves brand reputation, making it a strategic differentiator.
7. **Environmental Concern:** 72% express strong concern about reducing plastic waste, aligning with global sustainability goals.

Conclusion:

The study concludes that green packaging in e-commerce is both an environmental necessity and a strategic business decision. While consumers value sustainability, their purchase decisions are strongly influenced by cost, product safety, and trust in eco-labels. The persistent **attitude–behavior gap** suggests that businesses must do more than simply adopt eco-friendly materials—they must communicate authenticity, ensure durability, and balance affordability. Green packaging enhances brand image and customer loyalty, but its success depends on integrating ecological responsibility with functional performance and cost-effectiveness.

Realistic Solutions to the Research Problem

1. **Transparent Communication:** Use credible eco-labels, certifications, and clear sustainability claims to build consumer trust.
2. **Cost Optimization:** Adopt hybrid packaging strategies (mix of recyclable paper and lightweight plastics) to balance affordability and sustainability.

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3. **Consumer Education:** Run awareness campaigns highlighting the long-term benefits of green packaging, including reduced waste and improved product safety.
4. **Government Collaboration:** Align with regulatory frameworks and leverage subsidies or tax incentives for sustainable packaging adoption.

Innovative Solutions:

1. **Smart Packaging with QR Codes:** Integrate QR codes on packaging that link to sustainability information, recycling instructions, and brand transparency reports.
2. **Edible Packaging Films:** Explore biodegradable edible films for food and beverage e-commerce, reducing waste entirely.
3. **Reusable Return Packaging:** Introduce "returnable packaging" systems where customers can send back packaging for reuse, incentivized with discounts or loyalty points.
4. **Bioplastic Innovations:** Invest in next-generation bioplastics made from algae, corn starch, or sugarcane that mimic traditional plastic durability but are fully compostable.
5. **Modular Packaging Design:** Create adjustable, multi-use packaging that can be repurposed by consumers (e.g., boxes that fold into storage containers).

Future Scope of the Study

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Reusable Return Packaging System:

The Reusable Return Packaging System is an innovative, circular model designed specifically for the Indian e-commerce market. It replaces single-use packaging with durable, reusable "Eco Boxes" that customers can return after delivery. The process works in four simple modules:

1. Order & Deliver: Products are shipped in reusable boxes made from recycled materials.
2. Use & Return: Customers drop the empty boxes at designated kiosks or hand them to delivery agents.
3. Clean & Reuse: Returned boxes are sanitized and repacked at local cleaning centers for reuse.
4. Rewards & Track: Customers earn cashback or loyalty points through a QR code system integrated with e-commerce apps.

This model fits India's market perfectly—it leverages the country's dense retail network, local logistics partners, and consumer enthusiasm for cashback rewards. It reduces packaging waste, lowers costs for businesses, and encourages sustainable consumer behavior, creating a closed-loop packaging ecosystem that aligns with India's environmental goals and digital economy.

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GREEN FINANCING INITIATIVES: A COMPARATIVE STUDY OF SELECTED PUBLIC AND PRIVATE SECTOR BANKS IN INDIA

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Abstract:
This study provides an overview of green finance, its importance, and its potential role in building a sustainable future. It also examines the growth of green finance initiatives in both the public sector and private sector banking institutions, with a specific focus on the State Bank of India (SBI) and ICICI Bank.
The report explores how these two banks are contributing to the development of the green finance sector, particularly through their green deposit and green lending initiatives during the financial year 2025–26. The study is based on secondary data collected from the annual reports and sustainability reports published by SBI and ICICI Bank.

Introduction:
Over the past few decades, rapid industrialization, urbanization, and the excessive use of natural resources have been increasing pressure on the environment. Human activities such as deforestation, pollution, overconsumption of resources, and the burning of fossil fuels have contributed to climate change and environmental degradation. If these practices continue without proper action, they may seriously affect the availability of natural resources and the quality of life of future generations and may even lead to **Global Warming**. Therefore, there is an urgent need to adopt sustainable practices that protect the environment while supporting economic development.
Protecting the environment requires more than awareness; it also requires financial support. Projects such as renewable energy, afforestation, waste management, water conservation, and pollution control involve significant investment. To ensure that these projects receive adequate funding, the concept of Green Finance has gained importance. **Green Finance** directs financial resources towards environmentally sustainable projects, helping countries achieve economic growth while protecting natural resources.
Green finance in banking means using loans, investments, and financial services to fund eco-friendly projects. It helps pay for things like solar panels, wind power, electric cars, and green buildings to protect nature and stop climate change.

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This topic was selected on a purpose to understand how human activities have contributed to environmental problems and to explore how the financial sector can support sustainable development through Green Banking initiatives. Comparing Green Banking practices in public and private sector banks will provide a better understanding of their role in protecting the environment and promoting responsible economic growth.

Review of Literature:

P. Sahoo & BP. Nayak (2007) this report has examined the role of Green Banking in promoting sustainable development in India. The study highlights the environmental risks faced by industries which can also affect banks when businesses don't repay their loans which lead to financial losses.

Bihari, S.C (2010) This report has examined the concept and importance of Green Banking and its role in promoting environmental sustainability. The study explains how banks can use their financial activities to support environmentally friendly projects. It also emphasizes the importance of assessing the environmental impact of projects before providing finance, so that funds are directed towards genuinely sustainable activities. The study highlights that the banking sector can contribute to environmental protection by integrating environmental considerations into its lending and financial decisions.

Masukujjaman and Aktar (2014) The study examines the development and implementation of Green Banking in Bangladesh in relation to global initiatives. The study discussed the role of Green Banking in addressing environmental concerns such as climate change and in supporting sustainable development. It also examined the practices of commercial banks and considered their progress in relation to global Green Banking initiatives. The study was based on secondary data, making it useful for understanding the development of Green Banking practices and the broader international context.

Yadav, Singh & Vaishnav (2024) The study examines that banks and policymakers should give more attention to Green Banking, as it can help protect the environment while also improving a bank's financial performance and building trust among stakeholders and even improves bank's reputation.

Research Methodology:

1. Objectives of the Study:

i) To study the concept and importance of Green Finance in India.

ii) To study the Green Finance initiatives of SBI & ICICI Bank.

2. Research Design

This study is descriptive and comparative in nature, aimed at analyzing and comparing green financing initiatives of SBI and ICICI Bank.

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3. Data Collection Methods

This study is based on secondary data collected from RBI publication, annual report and green policies adopted by SBI & ICICI Bank.

4. Data Analysis Techniques

The collected information is analysed using a comparative method. The Green Finance actions taken by SBI & ICICI Bank, their environmental policies, digital banking services, green finance policies and sustainable practices are compared. Table & Graphs are used wherever necessary.

5. Scope of the Study

The study focuses on the green finance initiatives adopted by SBI and ICICI Banks and evaluates their contribution towards sustainable finance practices in India.

6. Limitations of the Study

i) The study is limited to comparison of SBI & ICICI Bank.

ii) The analysis is based only on the Annual Reports and Sustainability Reports for the financial year 2025-2026.

Data Analysis and Interpretation:

1. Green Finance Initiatives

SBI Green Finance Initiatives: The State Bank of India (SBI) promotes sustainable growth through green financing framework, offer loans to businesses for environmental projects like, PM Surya Ghar, Green car loan, Surya Shakti & Solar Finance, Compressed Bio-Gas (state), PM KUSUM scheme, SBI EV Mitra and also SBI has also taken an initiative for reducing carbon footprints in internal operations.

ICICI Bank Green Finance Initiatives: ICICI Bank drives green finance in India through multi-billion-rupee sustainable financing portfolio, issuing domestic green bonds, and funding friendly sectors like renewable energy, electricity mobility, and green building. In 2026 the bank also organised training programmes for employees across frontline, policy, risk, finance and leadership roles. The Bank also facilitated an in person training on green finance in real estate projects, with participation from business and risk functions from the financial sector.

Areas	***SBI***	***ICICI***
Renewable Energy	✔	✔
EV Loans	✔	✔
Green Building	✔	✔
Green Bond	✔	✔
Solar Energy	✔	x
Water harvesting	x	x
Agriculture	✔	✔

Comparison of Green Finance Initiatives of SBI and ICICI Bank

2. Deposits

SBI Green Finance Deposit

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The State Bank of India (SBI) offers the SBI Green Rupee Term Deposit (SGRTD) to fund eco-friendly projects and green initiatives. It requires a minimum deposit of ₹1,000 with no upper limit. As per the policy, the allocation of the proceeds raised from green deposits shall be based on the official Indian green taxonomy. The amount of green deposit raised has been utilised for financing of Green Car (EV) Loan portfolio. The Bank transparently reports the impact of its green deposits through structured impact reporting aligned with RBI's Master Direction November 2025.

ICICI Green Finance Deposit

ICICI Bank participates in sustainable and green financing frameworks, though specific retail "Green Deposit" product names or specialized green retail deposit nomenclatures may vary compared to standard fixed deposit offerings. The framework has been put in place based on inputs from the Government of India's Framework for Sovereign Green Bonds issued in 2022 and the RBI Directions, 2025 on Climate Finance and Management of Climate Change Risks, which details the Framework for Acceptance of Green Deposits.

Particular	SBI	ICICI
31 March 2025	₹ 105.92 crore	Not disclosed
31 March 2026	₹ 189.08 crore	Not disclosed
Cumulative on 31 March 2026	₹ 317.39 crore	Not disclosed

Comparison of Deposits of SBI and ICICI

A major distinguishing feature of SBI is its Green Rupee Term Deposit. SBI raised ₹317.39 crore through green deposits up to March 2026, with approximately ₹218 crore outstanding at year-end. Importantly, the bank states that the funds raised were utilized to finance its Green Car/EV Loan portfolio.

3. Advances

SBI Green Finance Advance

In 2026, the State Bank of India (SBI) crossed ₹1 lakh crore in green advances, targeting 7.5% to 10% of total advance by 2030. It has set up a specialized unit and launched CHAKRA, a Centre of Excellence, to fund sustainable sunrise sectors. 25% of these green advances to be funded by green Lines of Credit from Multilaterals & DFIs/green bond/sustainability-linked instruments/green loans/domestic green deposits etc.

ICICI Bank Green Finance Advance

ICICI Bank's green advance refers to its sustainable financing and green lending portfolio, which reached ₹307.04 billion. The bank provides targeted loans and financial advances for eco-friendly projects—such as renewable energy, electric

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vehicles, green buildings, and energy efficiency initiatives—supporting India's transition to a low-carbon economy. The Bank's focus is on delivering seamless and enhanced customer experience through investment in advanced technologies and platforms. The Foundation has supported hospitals with advanced surgical and diagnostic tools, including heart-lung machines and cardiac catheterisation labs.

Comparison of Advances of SBI and ICICI

Indicator	SBI	ICICI
Green advance / financing	₹1,18,723 crore	₹30,809 crore
Green finance ratio	2.83%	Green finance= 31% of sustainable-finance portfolio
Green-finance growth	112% YOY	Comparable growth not separately disclosed

SBI reported green advances of ₹1,18,723 crore as of 31 March 2026. This represents 2.83% of its domestic gross advances. SBI's green advances increased substantially from the previous year, recording 112% year-on-year growth. This indicates that SBI has been actively increasing the allocation of its lending portfolio towards environmentally sustainable activities. Its green financing includes areas such as:

- Renewable energy projects
- Solar and hydro projects
- Wind and biomass projects
- Electric and hybrid vehicles
- Green buildings
- Energy efficiency
- Sustainable infrastructure

ICICI Bank follows a somewhat different reporting approach. Instead of separately reporting "green advances" in the same format as SBI, it reports a sustainable-financing portfolio of ₹993.85 billion. Green financing constituted 31% of this sustainable-financing portfolio. Therefore: ₹993.85 billion × 31% = approximately ₹308.09 billion or approximately ₹30,809 crore. The green-financing component covers areas such as renewable energy, electric vehicles, green-certified real estate, waste management, water and sanitation, and green hydrogen/electrolysers.

Conclusion:

The comparison is between SBI and ICICI Bank who have adopted green-finance initiatives across various key areas such as renewable energy, electric vehicles, green building, green bond, solar energy, agriculture. Both banks tend to grow year-over-

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year. ICICI Bank has not disclosed about its green deposit growth in its annual report for the financial year 2025-2026. Overall, both banks are supporting the transition towards sustainability development, while greater transparency, wider sector coverage.

Recommendation:

Increase Green Lending

Banks should increase financing for renewable energy, EVs, green buildings and energy-efficient projects.

Improve Green-Finance Disclosure

Banks should follow more standardised methods for reporting green-finance data so that public and private sector banks can be compared easily.

Promote Green Banking Products

Banks should introduce more affordable green loans and sustainable financial products for individuals, businesses and MSMEs.

Increase Customer Awareness

Banks should educate customers about the benefits of green loans, solar financing and other sustainable products.

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DOING GOOD VS. LOOKING GOOD: THE ROLE OF ETHICAL LEADERSHIP IN DRIVING ESG AUTHENTICITY AND WORKFORCE ATTRACTION IN THE NEXT-GENERATION ERA

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Abstract:
This study explores the role of Ethical Leadership in driving authentic ESG practices and examines how Gen Z distinguishes between companies that are genuinely "Doing Good" versus those that are merely "Looking Good." In an era of information explosion and rising concern for social and environmental issues, young professionals increasingly expect leaders to demonstrate transparency, consistency, and accountability beyond marketing claims. The research highlights that Gen Z values proof over promises and expects corporate leaders to take responsibility for stopping greenwashing, protect employees who raise ethical concerns, and ensure that internal actions align with public commitments. For this generation, ESG is not viewed as a branding tool but as a measure of leadership integrity and long-term purpose. To attract and retain young talent, companies must adopt radical transparency in reporting, align advocacy with actions, embed ESG into leadership accountability, demonstrate real impact, and build trust internally before promoting it externally.

Key-words: *Ethical Leadership, ESG, Gen Z, Corporate Accountability, New generation.*

Introduction:

1. Leadership evolution:

At the onset of the 20th century, leader's inner qualities and skill levels used to be the main criteria of recognizing effective leadership.

Later in late 1960, a new perspective evolved. This perspective consisted of leadership styles like autocratic, directive, consultative, participatory leaderships given by Vroom and Yetton 1973 (Aronson, 2001). With the emergence of different leadership styles, there has always been limitations to it.

As we entered the 21st century, researchers have not yet found the correct definition of what leadership actually is. Some focus on management abilities while some separate management and leadership as different processes since leadership is a complex topic to be discussed.

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In simple words leadership can be defined as the art of bringing people together and directing them to achieve a common goal (Northhouse, 2016).

2. ESG Overview:

- The E stands for environmental- how a company reduces its waste, emissions, and opt for greener methods without harming the flora and fauna.
- The S stands for social- the impact of company's action on the society as a whole like providing unadulterated products, investing for social benefit, preventing work-force exploitation and focusing on health and safety of all the living.
- The G stands for governance- how a company provides transparent reports regarding the financial performance and business operation, ethical decision making and holding accountability for its own actions

3. ESG Evolution:

In the 1970s, to guide investors to be ethical, Socially Responsible Investing (SRI) was introduced. Later SRI evolved to Corporate Social Responsibility (CSR) that focused on social issues to protect the human rights. In the due course of time, some investors started to look for companies that were keeping in mind environmental impact of their actions. Therefore, ESG came to the forefront since the stakeholders started to focus on the environment and society.

In the year 1997, the rise of Global reporting initiative (GRI) highlighted environmental concerns then later broadened its scope to focus on governance issues.

Now, integrated ESG is playing a vital role in the modern era since the youngsters are looking forward to creating an environment which is conducive for people today and for the next generation.

4. The role of Ethical leaders in driving ESG practices and Gen Z:

In the era of advanced technology and increasing literacy rate, people have become concerned about the environmental issues. It is believed that leaders influence the subordinate and hence leader's role is crucial to save the environment, protect the people's interest and frame policies that are transparent. A leader who does not care about the environment, does not care about his own future.

Leaders who follow ESG practices, gets less profit but reaps the maximum benefit in the long-run.

Gen Z seems to be taking initiative, understanding various aspects and is expecting sustainability and eco-friendly practices from the future leaders.

Literature Review:

1. Ethical leadership in the eyes of Gen Z:

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Mathur & Hameed (2016) highlight Generation Z as key workplace reformers who demand verifiable ethical action over mere corporate claims in today's information-rich environment. Modern leaders must actively earn Gen Z's trust through transparent communication and meaningful cultural integration to optimize their potential **(Elmore, 2014)**. As a pragmatic and digitally savvy cohort, Gen Z evaluates leaders strictly on visible changes rather than passive promises.

2. **Expectations from leaders:**

   Brown & Treviño (2006) define ethical leaders as fair, principled decision-makers who prioritize the well-being of their employees and broader society. In an era where technology enables easy manipulation, leaders carry the responsibility to provide accurate, transparent organizational information. Therefore, ethics must form the core of a leader's identity and guide every strategic decision **(Giessner et al., 2015)**.

3. **Generation shifts in workplace preferences:**

   Twenge (2010) explores evolving generational workplace preferences, identifying Gen Z's distinct career expectations compared to earlier generations. His findings show that Gen Z employees are uniquely motivated by workplace transparency, job stability, and clear career development opportunities. Consequently, modern organizations must adapt their leadership strategies to match how technology has reshaped this generation's work values.

Statement of Problem:

1. **Enforcement gap:** Existing ESG frameworks fail to effectively deter corporate fraud and greenwashing, especially where powerful leadership suppresses whistleblowing.
2. **Engagement gap:** Public indifference toward long-term sustainability outcomes remains under-examined alongside corporate misconduct.
3. **Integration gap:** Little research links regulatory reform with generational shifts in accountability demands to build sustainable corporate practices.

Objective of the Study:

1. Understanding the extent of Gen Z's knowledge regarding the ESG authenticity and leader's responsibility.
2. Decoding ESG authenticity influences the career choices among early-career professionals and young job seekers.

Hypothesis:

1. **H0:** ESG authenticity does not influence the link between ethical leadership and workforce attraction.

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H1: ESG authenticity positively influences the link between ethical leadership and workforce attraction.

2. **H0**: Next-Gen job seekers do not hold high levels of ESG skepticism, nor do they demand proof of ethical leadership before applying.

   H1: Next-Gen job seekers hold high levels of ESG skepticism and demand proof of ethical leadership before applying.

Research Methodology:

Research Universe	**Mumbai Suburbs**
Sampling method	Purposive Sampling
Sample Size	121
Method of Data Selection	Primary and Secondary Data
Method of primary data selection	Pre-Structured Questionnaire
Method of secondary data collection	Articles, Research papers, Journals, Books.

Data Collection and Interpretation:

1. Sample Demographics

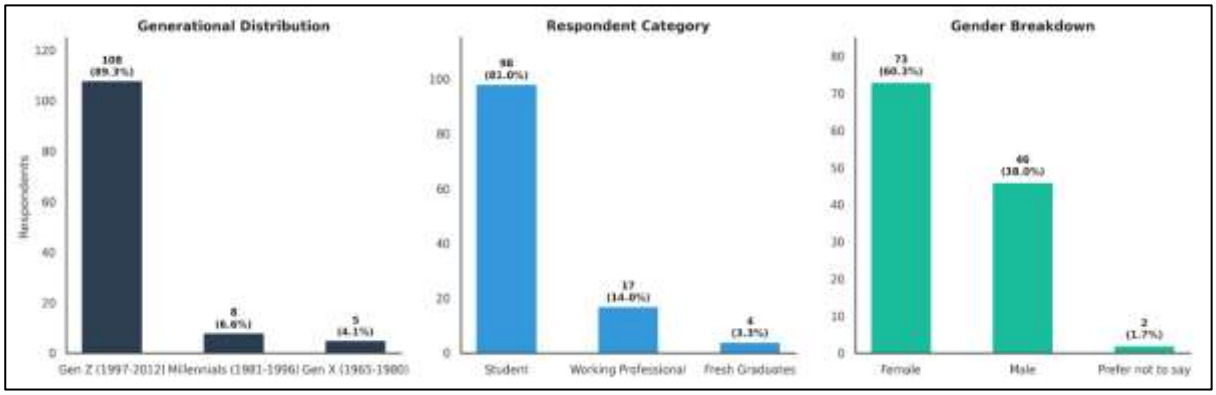

Figure 1

- **Generational Distribution:** Gen Z makes up the vast majority (89.3%), followed by Millennials (6.6%) and Gen X (4.1%).
- **Respondent Category:** Students constitute 82.4%, Working Professionals account for 14.3%, and Fresh Graduates represent 3.4%.
- **Gender Breakdown:** Females account for 60.3%, Males represent 38.0%, and 1.7% preferred not to say.

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2. Candidate Verification Behaviors

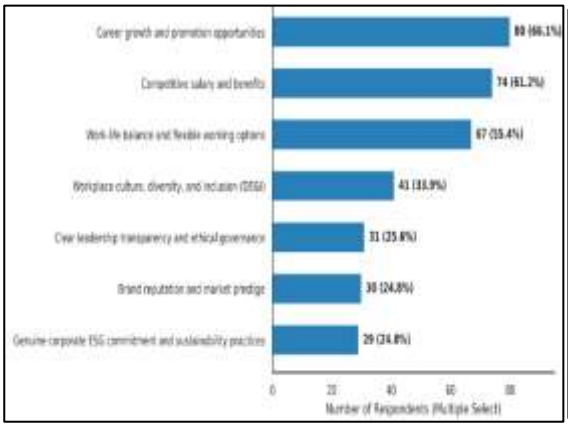

Figure 2

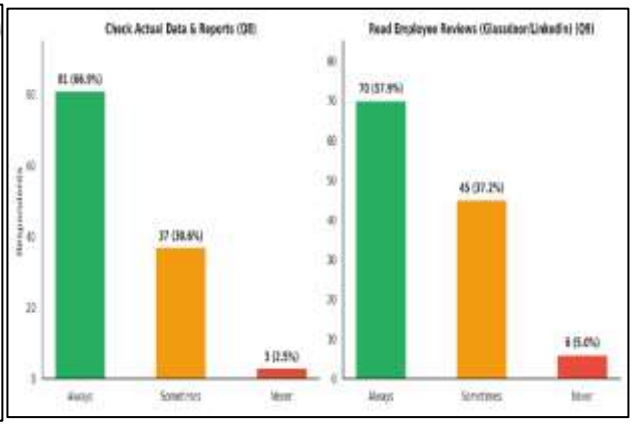

Figure 3

- **Factors Important for joining a company:** 66.1% preferred career growth and 61.2% chose competitive salary and benefits. Genuine corporate ESG commitment and sustainability practices was the least important factor with 24.0%
- **Checking Actual Data & Reports:** 66.9% always inspect official ESG data and reports, 30.6% do so sometimes, and only 2.5% never check.
- **Reading Employee Reviews:** 57.9% always read platforms like Glassdoor/LinkedIn to verify ESG claims, 37.2% do so sometimes, and 5.0% never read reviews.

3. Leadership Expectations & Action Thresholds

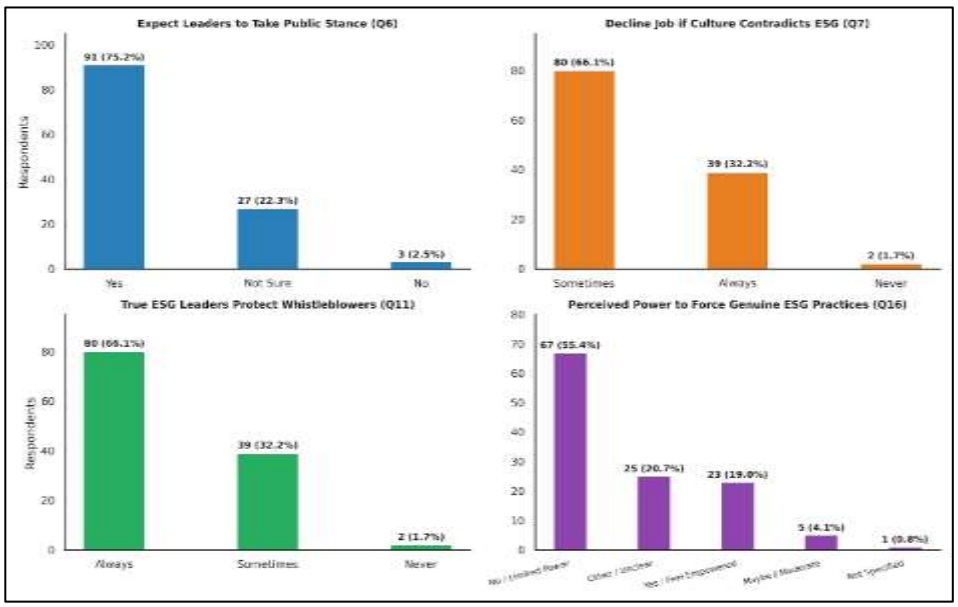

Figure 4

- **Public Stance Expectation:** 75.2% answer yes to expecting corporate leaders to take public stances on socio-environmental issues, 22.3% are not sure, and 2.5% say no.

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- **Declining Contradictory Job Offers:** 66.1% sometimes decline offers where culture contradicts ESG claims, 32.2% always decline, and 1.7% never decline.
- **Protecting Whistle-blowers:** 66.1% state true ESG leaders always protect whistle-blowers, and 32.2% say Sometimes.
- **Perceived Individual Power:** 55.4% feel they have no / limited power individually, 19.0% feel empowered, 20.7% hold nuanced/conditional views, and 4.1% feel moderate influence.

4 Greenwashing, Lobbying & Ethical Responsibility

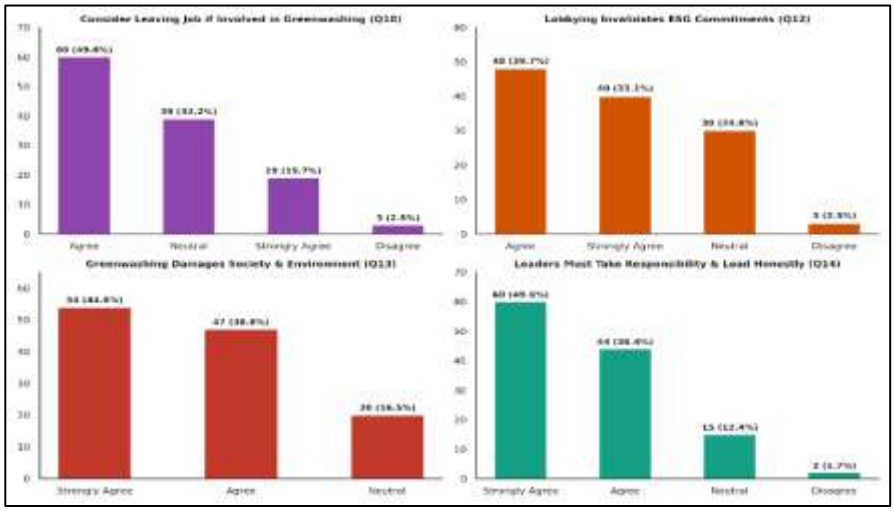

Figure 5

- **Leaving Over Greenwashing:** 49.6% agree and 15.7% strongly agree (Total: 65.3%) that they would consider leaving a job involved in greenwashing; 32.2% remain neutral.
- **Behind-the-Scenes Lobbying:** 39.7% agree and 33.1% strongly agree (Total: 72.8%) that contradictory policy lobbying invalidates public ESG commitments.
- **Societal Impact of Greenwashing:** 44.6% strongly agree and 38.8% agree (Total: 83.4%) that leader-driven greenwashing causes broader societal and environmental harm.
- **Leadership Accountability:** 49.6% strongly agree and 36.4% agree (Total: 86.0%) that transformational leaders must take responsibility to eliminate greenwashing.

Major Findings of the Study:

1. Hypothesis 1

H0: ESG authenticity does not influence the link between ethical leadership and workforce attraction.

H1: ESG authenticity positively influences the link between ethical leadership and workforce attraction.

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Finding:

75.2% of respondents expect leaders to publicly stand for social/environmental issues, and 98.3% link genuine ESG leadership to protecting whistleblowers. About 1 in 4 also ranked "leadership transparency" or "genuine ESG commitment" among their top reasons to join a company.

Result: H1 supported — ethical leadership visibly shapes how authentic a company's ESG image feels, which in turn affects attraction. For them, ESG is a test of leadership, honesty, and consistency, not a branding tool. While investors use ESG to judge financial performance, job seekers now use it to judge employer credibility.

Ethical Leadership------->Perceived ESG Authenticity------->Workforce Attraction

2. **Hypothesis 2**

H0: Next-Gen job seekers are not ESG-skeptical and don't demand proof of ethical leadership.

H1: Next-Gen job seekers are highly ESG-skeptical and demand proof before applying.

Finding:

Almost 98% of respondents check a company's actual data, reports, or employee reviews before trusting its ESG claims — they don't rely on advertising alone. 65.3% would consider leaving a job if they discovered greenwashing.

Result:

H1 supported — today's job seekers actively verify claims rather than accept them at face value. Hence Gen Z no longer trusts surface-level ESG claims and clearly differentiates "Doing Good" from "Looking Good."

3. When picking a job, people care most about career growth, good pay, and work-life balance. Among ESG values, social impact is the top priority, while environmental issues matter least during job searches. Gen Z believes that ethical leaders will naturally handle environmental and governance improvements through responsiveness and responsibility.

Limitation of Study:

1. The research survey is limited to the degree college students and some working professionals.
2. Data collection was constrained by time, resulting in a smaller sample size.
3. No formal statistical tools were used to test the hypothesis.
4. The mind-set of the respondents to this survey is not clearly known to ensure a correct response.

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Suggestions:

1. **Internal Reporting:** Set up safe, anonymous whistle blower hotlines and ethics committees to report workplace misconduct.
2. **External Audits:** Require independent ESG audits and cross-check company claims to ensure full transparency.
3. **Public Accountability:** Leverage investigative journalism and social media with verified evidence to expose unethical leaders.

Scope for further research:

1. A Cross-generational study can be done comparing Gen Z with Gen Alpha as they enter the new work-force that would provide valuable insights into changing expectations.
2. We can conduct sector-specific analysis across various industries such as IT, manufacturing, healthcare and startups to understand how the organizations influence social and environmental priorities.
3. We can even broaden the geographical scope through cross-cultural comparison. It would help us understand whether the young generation's preferences are globally consistent or culturally restricted.

Conclusion:

Authentic ESG commitment and ethical leadership directly drive talent attraction, as modern job seekers actively verify corporate claims and reject greenwashing. While salary and career growth remain top priorities, candidates heavily weigh social impact and executive transparency to judge employer credibility. Ultimately, ESG has evolved from a marketing tool into a non-negotiable test of leadership integrity.

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GAP GYAN
A GLOBAL JOURNAL OF SOCIAL SCIENCES
(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
Globally peer-reviewed and open access journal.

A STUDY ON WORKPLACE WELLBEING AND EMPLOYEE PRODUCTIVITY UNDER ESG FRAMEWORK

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Abstract:
Environmental, Social, and Governance (ESG) principles have emerged as a strategic framework for promoting sustainable business practices and creating long-term organizational value. Among the three pillars of ESG, the social dimension places significant emphasis on workplace wellbeing, recognizing employees as key stakeholders in organizational success. This study explores the relationship between workplace wellbeing and employee productivity within the ESG framework, examining how organizations that prioritize employee health, safety, work-life balance, diversity and inclusion, mental wellbeing, and employee engagement achieve enhanced organizational performance. The research highlights that investments in employee wellbeing contribute to increased motivation, job satisfaction, innovation, retention, and overall productivity while reducing absenteeism and workplace stress. Furthermore, the study discusses how integrating wellbeing initiatives into ESG strategies strengthens corporate reputation, supports sustainable growth, and improves stakeholder confidence. By synthesizing existing literature and contemporary ESG practices, the research provides valuable insights into the role of workplace wellbeing as a critical driver of employee productivity and long-term business sustainability. The findings underscore the importance of embedding employee-centric policies within ESG frameworks to foster resilient, inclusive, and high-performing organizations in an evolving global business environment.

Keywords: *ESG (Environmental, Social, and Governance), Workplace Wellbeing, Employee Productivity, Employee Engagement, Corporate Sustainability, Mental Wellbeing, Work-Life Balance.*

Introduction:

In today's competitive and sustainability-driven business environment, organizations are increasingly adopting the Environmental, Social, and Governance (ESG) framework to create long-term value while addressing the expectations of employees, investors, customers, and society. Among the three ESG pillars, the Social dimension places strong emphasis on employee wellbeing, recognizing that a healthy, engaged, and motivated workforce is essential for sustainable organizational success. Workplace wellbeing encompasses employees' physical, mental, emotional,

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and social health. It includes safe working conditions, work-life balance, employee engagement, diversity and inclusion, career development, and psychological safety. Organizations that prioritize these aspects create a positive work environment that enhances job satisfaction, reduces stress and absenteeism, and improves employee commitment and performance.

Against this background, this study examines the relationship between workplace wellbeing and employee productivity under the ESG framework. It aims to explore how employee-centric ESG practices contribute to enhanced organizational performance and sustainable business growth. The findings are expected to provide valuable insights for managers, policymakers, and researchers in developing effective strategies that support both employee wellbeing and organizational success.

Review of Literature:

1. **Kundi et al. (2020)** examined the relationship between employee psychological wellbeing and job performance. The study found that psychological wellbeing positively influences employee performance. It also showed that affective commitment plays an important role in connecting employee wellbeing with job performance, while job insecurity may negatively affect this relationship.
2. **Pagán-Castaño et al. (2020)** studied the factors that influence employee wellbeing in work environments. The study highlighted the role of human resource practices, employee support, work conditions, and organizational factors. It concluded that employee wellbeing contributes to improved employee performance and supports positive organizational outcomes.
3. **Darvishmotevali and Ali (2020)** examined the relationship between job insecurity, employee wellbeing, and job performance. The study found that job insecurity negatively affects employee wellbeing and may reduce job performance. The findings indicated that psychological resources can help employees manage workplace uncertainty and maintain better performance.
4. **Huo et al. (2023)** examined the effect of work–life conflict on employee job performance. The study found that work–life conflict negatively affects employee wellbeing, which may reduce job performance. The findings suggest that organizations should promote work–life balance and provide supportive workplace policies to improve employee wellbeing and productivity.
5. **Medina-Garrido et al. (2023)** studied the relationship between work–family policies, employee wellbeing, and job performance. The study found that flexible working hours, flexible work locations, and family-support policies can improve employee wellbeing. Employee wellbeing acted as an important factor linking work–family support with better job performance.
6. **Chen et al. (2023)** examined the relationship between work design, employee wellbeing, and employee retention. The study found that positive job

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characteristics, supportive work relationships, and favourable working conditions contribute to employee wellbeing. Improved wellbeing was associated with greater job satisfaction, organizational commitment, productivity, and employee retention.

7. **Din et al. (2025)** examined the relationship between green human resource management, employee wellbeing, and employee engagement. The study found that environmentally responsible human resource practices can support employee wellbeing and encourage employee participation in environmental activities. The findings show that the Environmental dimension of ESG can influence employee attitudes and engagement.
8. **Pandey (2025)** conducted a systematic literature review on employee wellbeing by examining a large number of research studies. The review identified important factors affecting employee wellbeing, including organizational support, leadership, job characteristics, workplace culture, and human resource practices. It also found that employee wellbeing is associated with positive outcomes such as engagement, job satisfaction, commitment, performance, and organizational effectiveness.
9. **Valtonen et al. (2025)** examined the influence of artificial intelligence on employee wellbeing. The study found that the use of artificial intelligence may affect employee wellbeing indirectly through factors such as task optimization and workplace safety. The findings suggest that technology should be implemented responsibly to improve employee wellbeing and workplace effectiveness.
10. **Wiyono et al. (2025)** examined the influence of Environmental, Social, and Governance practices on employee performance and wellbeing. The study found that environmental and social practices positively influence employee wellbeing and performance. Governance practices were found to strengthen these effects. The study emphasized that ESG integration can support employee satisfaction, engagement, and sustainable organizational growth.

Objective of the Study:

1. To examine the concept and significance of workplace wellbeing within the Environmental, Social, and Governance (ESG) framework.
2. To analyze the relationship between workplace wellbeing and employee productivity in organizations.
3. To identify the key workplace wellbeing factors, such as employee health, work-life balance, mental wellbeing, and employee engagement, that influence productivity.
4. To evaluate the role of ESG-oriented workplace practices in enhancing employee performance, job satisfaction, and organizational sustainability.

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5. To suggest recommendations for organizations to strengthen workplace wellbeing initiatives as part of their ESG strategies to improve employee productivity and long-term business performance.

Research Methodology:

The present research study titled **"Workplace Wellbeing and Employee Productivity Under the ESG Framework"** is based on secondary data. Secondary data refers to information that has already been collected, analyzed, published, or documented by researchers, government agencies, international organizations, companies, academic institutions, and professional bodies. The researcher uses this existing information to understand the relationship between workplace wellbeing and employee productivity within the Environmental, Social, and Governance (ESG) framework.

Research Type: Descriptive Research

Database: Secondary Data

1. **International Labour Organization (ILO)**This is one of the most relevant reports for your research topic because it directly examines the relationship between employee wellbeing and productivity. The report discusses how wellbeing can influence productivity and how productivity may also affect the wellbeing of individuals and society. It reviews research related to the measurement of wellbeing and productivity and explains the possible connection between better working conditions and improved productivity. This ILO report examines working hours, working-time arrangements, and their effect on work–life balance. It is useful for studying how long working hours, flexible work arrangements, and working-time policies may influence employee wellbeing.
2. **World Health Organization (WHO)**This WHO publication provides information about mental health, workplace stress, employee wellbeing, and the importance of creating healthy work environments. It explains that work can support mental health, but poor working conditions may negatively affect employees. This report provides evidence-based recommendations for promoting mental health in workplaces. It includes organizational interventions, manager training, employee training, individual support, and return-to-work measures.
3. **Global Reporting Initiative (GRI) 403** is an important ESG reporting standard related to employee health and safety. It provides a framework for organizations to report workplace health and safety impacts and the measures taken to manage them. It covers the prevention of workplace harm and the promotion of employee health.

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4. SEBI Business Responsibility and Sustainability Reporting (BRSR) The Securities and Exchange Board of India (SEBI) introduced the BRSR framework to improve ESG-related disclosures by listed companies. The framework provides information about environmental responsibility, employee welfare, social performance, and governance practices. The BRSR framework is highly useful for your study because company reports may include information about employee health and safety, employee training, workforce diversity, employee welfare, grievance mechanisms, and responsible business practices.

Workplace Wellbeing and Employee Productivity Under the ESG Framework of various Reputed Industries:

1.Infosys considers employee wellbeing an important part of its social sustainability strategy. The company's ESG reporting gives importance to employee wellness, workplace experience, inclusion, learning, and workforce development. Its approach to employee wellbeing includes support for physical and emotional health and the development of an inclusive workplace. The company recognizes that employees require a supportive environment in which they can develop their skills, maintain wellbeing, and contribute effectively to organizational objectives. Infosys also focuses on continuous learning and skill development to improve employee capabilities and prepare employees for changing technological and business requirements. These initiatives may contribute to employee engagement, job satisfaction, adaptability, and long-term productivity.

2.Wipro integrates employee wellbeing with its sustainability and human-capital approach. The company's sustainability reporting focuses on creating an equitable, inclusive, respectful, and responsible workplace. Employee development, continuous learning, inclusion, recognition, and wellbeing are treated as important elements of workforce management. Wipro's approach indicates that employee wellbeing is connected not only with health but also with opportunities for learning, professional growth, participation, and a sense of belonging. The company's ESG reporting also includes governance structures and performance indicators that support the monitoring of sustainability-related goals. These practices may strengthen employee motivation, workforce capability, organizational commitment, and productivity.

3.Tata Consultancy Services emphasizes employee health, wellness, learning, and workforce development as important aspects of organizational sustainability. The company recognizes that employee wellbeing supports the development of a capable and engaged workforce. Employee wellness initiatives may help employees manage health-related and workplace challenges, while training and development programmes improve professional knowledge and skills. A strong focus on learning can increase employee adaptability and support better

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performance in a technology-driven work environment. The integration of employee wellbeing with workforce development demonstrates that employee welfare can be considered a strategic investment rather than only an employee benefit.

4. **Reliance Industries** provides employee-related information through its human-capital and integrated annual-report disclosures. The company focuses on employee engagement, workforce development, learning, workplace safety, and organizational culture. During the financial year 2024–25, employee surveys were used across major business segments to obtain employee feedback and support workforce engagement. Employee participation and feedback are important because they help organizations understand employee needs, workplace concerns, and opportunities for improvement. Such practices may contribute to employee satisfaction, organizational commitment, and workforce stability.
5. **HDFC Bank** has included employee wellbeing as an important part of its people and social initiatives. Its employee wellbeing approach has addressed physical, mental, emotional, and financial wellbeing. A comprehensive approach is important because employee wellbeing is influenced by several factors, including health, emotional support, financial security, workplace relationships, and work-related stress. Employee support programmes may improve employee confidence, job satisfaction, engagement, and commitment. A healthy and supportive workplace may also reduce stress and help employees maintain consistent work performance.

Scope of the Research :

1. **Primary Data-Based Study**
   Future research may collect primary data from employees through questionnaires, interviews, or surveys to understand their actual experiences and perceptions regarding workplace wellbeing, ESG practices, and employee productivity.
2. **Industry-Wise Comparative Study**
   Future studies may compare workplace wellbeing practices and their impact on employee productivity across different industries such as information technology, banking, healthcare, manufacturing, education, and hospitality.
3. **Impact of Mental Wellbeing on Employee Productivity**
   Further research may examine how workplace stress, burnout, emotional wellbeing, mental health support, and counselling programmes influence employee performance, motivation, engagement, and productivity.
4. **Work–Life Balance and Employee Performance**
   Future studies may investigate the impact of flexible working hours, remote work, hybrid work, leave policies, and workload management on employee wellbeing and work efficiency.

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5. **Role of ESG Practices in Employee Retention**
   Future research may examine whether strong ESG practices and employee wellbeing programmes improve employee satisfaction, organizational commitment, employee loyalty, and retention.
6. **Development of an ESG-Based Employee Wellbeing Model**
   Future research may develop a comprehensive framework for measuring workplace wellbeing by combining ESG indicators such as employee health and safety, diversity and inclusion, training, ethical governance, and employee productivity.

Suggestions and Recommendations:

1. **Integrate Employee Wellbeing into ESG Strategy**
   Organizations should include employee wellbeing as an important part of their ESG policies. Employee health, safety, mental wellbeing, and welfare should be linked with long-term organizational goals.
2. **Provide Mental Health Support**
   Organizations should offer counselling, stress-management programmes, and employee assistance services. This can reduce workplace stress and improve employee focus and productivity.
3. **Promote Work–Life Balance**
   Flexible working hours, suitable leave policies, and proper workload management should be provided. A healthy work–life balance can reduce burnout and improve employee satisfaction.
4. **Ensure Workplace Health and Safety**
   Organizations should maintain safe and healthy working conditions and conduct regular safety training. This can reduce workplace risks and improve employee confidence and performance.
5. **Encourage Employee Participation**
   Employees should be given opportunities to share ideas and provide feedback. Participation in decision-making can increase employee motivation, trust, and commitment.
6. **Provide Continuous Training and Development**
   Regular training and skill-development programmes should be conducted. These programmes can improve employee knowledge, work quality, adaptability, and productivity.

Conclusion:

The present study examined the relationship between workplace wellbeing and employee productivity under the ESG framework using secondary data. The findings indicate that employee wellbeing, including physical and mental health, workplace safety, work–life balance, employee engagement, training, diversity, and inclusion,

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plays an important role in improving employee performance and organizational productivity. The study highlights that the Social and Governance dimensions of ESG support employee wellbeing through fair policies, ethical leadership, safe working conditions, employee development, and effective workplace practices. Organizations that invest in employee wellbeing can improve employee motivation, job satisfaction, engagement, retention, and work efficiency while reducing stress, absenteeism, and employee turnover. Therefore, employee wellbeing should be treated as a strategic investment rather than only an employee welfare activity. Integrating wellbeing into ESG policies can help organizations create a healthy, productive, inclusive, and sustainable workforce and achieve long-term organizational growth.

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A GLOBAL JOURNAL OF SOCIAL SCIENCES
(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
Globally peer-reviewed and open access journal.

ESG INVESTING AND FINANCIAL DECISION-MAKING: A STUDY OF INDIA' YOUNG INVESTORS

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Abstract:
This study examines the role of Environmental, Social and Governance (ESG) factors in the financial decision-making of young investors in India. It focuses on their ESG awareness, perceptions and investment preferences, along with the influence of financial literacy, risk, return and liquidity. The study is based on secondary data from academic studies, regulatory reports and institutional sources. The findings suggest that ESG considerations are becoming increasingly relevant to young investors, although traditional financial factors continue to influence investment decisions. The study highlights the importance of ESG awareness, financial literacy and transparent sustainability disclosures in promoting responsible and sustainable investment behaviour among young investors.
Keywords: *ESG Investing, Young Investors, Financial Decision-Making, Financial Literacy, Sustainable Investment, ESG Awareness, BRSR.*

Introduction:

Environmental, Social and Governance (ESG) investing has emerged as an important approach to investment decision-making, reflecting a growing awareness that financial returns are not the only factors that matter to investors. ESG investing considers a company's performance in three broad areas: **Environmental** factors such as climate change, carbon emissions, resource conservation and waste management; **Social** factors such as employee welfare, diversity, human rights and community development; and **Governance** factors such as corporate transparency, ethical business practices, board accountability and shareholder rights. Increasingly, investors are evaluating companies not only on their profitability and financial strength but also on their ability to create sustainable long-term value.

In India, the growth of ESG investing has been supported by increasing awareness of sustainability, responsible business practices, corporate disclosures and changing investor preferences. The growing emphasis on **Business Responsibility and Sustainability Reporting (BRSR)** has also encouraged greater transparency regarding companies' environmental, social and governance practices. At the same time, the expansion of digital investment platforms, mutual funds, stock-market

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applications and financial education has made investing more accessible to younger individuals.

Young investors in India represent an important and emerging segment of the investment community. Many young investors are increasingly exposed to issues such as climate change, social responsibility, ethical business practices and corporate governance through social media, digital platforms and educational content. These factors may influence their perceptions of companies and investment products. However, the extent to which ESG considerations actually influence their **financial decision-making**—such as investment selection, risk perception, portfolio allocation, investment horizon and willingness to sacrifice short-term returns for long-term sustainability—remains an important area of study.

The relationship between ESG considerations and financial decision-making is particularly relevant because young investors may have different investment priorities compared with traditional investors. While factors such as **returns, risk, liquidity and capital appreciation** continue to influence investment decisions, ESG factors may increasingly act as additional criteria in selecting investments. Financial literacy, ESG awareness, risk tolerance, investment experience and access to financial information may further determine whether young investors incorporate ESG considerations into their investment choices.

Against this background, the present study, **"ESG Investing and Financial Decision-Making: A Study of India's Young Investors,"** seeks to examine the awareness, perceptions and attitudes of young investors towards ESG investing and analyse the extent to which ESG factors influence their financial decisions. The study may also explore whether demographic and financial characteristics such as age, income, education, investment experience and financial literacy influence the adoption of ESG-oriented investment practices. The findings can provide useful insights for investors, financial institutions, investment advisors, companies and policymakers seeking to promote responsible and sustainable investment practices among India's younger generation.

Literature Review:

ESG investing integrates environmental, social and governance factors with traditional financial considerations such as risk, return and profitability to support long-term investment decisions. Its importance is growing among young investors due to increasing exposure to sustainability and responsible investment through digital and educational platforms.

Friede, Busch and Bassen (2015) (Friede et al., 2015; Amel-Zadeh & Serafeim, 2018) conducted an extensive review of more than 2,000 empirical studies examining the relationship between ESG factors and corporate financial performance. Their study found that a large proportion of the studies reported a positive or neutral

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relationship between ESG performance and financial performance. The authors concluded that considering ESG factors in investment analysis does not necessarily imply sacrificing financial performance. Their findings provide an important foundation for understanding why investors may consider ESG characteristics while making investment decisions.

Renneboog, Ter Horst and Zhang (2008); (Renneboog et al., 2008) examined socially responsible investment across different countries and highlighted that investors' attitudes towards socially responsible investments are influenced by social, cultural and institutional factors. Their research indicated that investors may accept certain financial trade-offs in order to invest in companies that are consistent with their ethical and social values. This finding is relevant to young investors, as personal values and social awareness may influence their investment preferences.

Hartzmark and Sussman (2019) (Hartzmark & Sussman, 2019) investigated whether investors respond to information regarding the sustainability performance of investment funds. Their findings indicated that investors reacted positively to sustainability ratings and redirected investments towards funds with higher sustainability ratings. The study demonstrates that sustainability-related information can influence actual investment behaviour rather than merely affecting investors' opinions. This is particularly relevant in the present study, which seeks to determine whether ESG awareness among young investors translates into actual financial decision-making.

Amel-Zadeh and Serafeim (2018) explored The role of ESG information in investment decisions has also been examined from the perspective of investor preference and the use of ESG information by investment professionals and found that ESG information was used for multiple purposes, including investment risk management, identification of investment opportunities and assessment of company performance. Their study suggests that ESG information can complement traditional financial analysis and contribute to more comprehensive investment decisions.

Shroff, Paliwal and Dewasiri (2024) specifically examined the impact of financial literacy on investment decisions in an emerging-market context using a sample of **384 investors from India**. Their study highlights the importance of financial literacy in investment decision-making and provides empirical evidence from the Indian investment environment. The findings are particularly relevant to the present study because they establish a connection between financial knowledge and investment decisions among Indian investors. This supports the inclusion of financial literacy as an important variable while examining ESG-oriented investment behaviour among young investors in India

Chaturvedi, Singh, Jain and Chaturvedi (2024) (Chaturvedi et al., 2024) examined the **impact of financial literacy on investment behaviour among**

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young investors in India. The study focused on financial literacy, financial attitude, financial knowledge and investment behaviour. It highlights that financial literacy and knowledge contribute to financial understanding and influence decisions relating to savings and investments. The study further indicates that financial literacy is associated with a more positive financial attitude and can support more rational financial decision-making. This study is particularly relevant to the present research because it directly focuses on young Indian investors and provides a basis for examining whether financial knowledge may also influence their awareness and adoption of ESG-oriented investments.

SEBI (2021) introduced the **Business Responsibility and Sustainability Reporting (BRSR)** framework for listed entities. The framework strengthened the reporting of information relating to environmental, social and governance performance and made sustainability-related information more structured and accessible to investors. This development is significant for investment decision-making because investors can increasingly consider non-financial information along with traditional financial indicators when evaluating companies.

Research Gap:

The review of existing literature indicates that considerable research has examined the relationship between ESG performance and financial performance, socially responsible investment, ESG information and professional investment behaviour; however, relatively limited attention has been given to **young individual investors in India** and the extent to which ESG considerations influence their actual financial decision-making. A specific research gap exists in understanding whether **ESG awareness translates into actual investment behaviour**, as factors such as financial literacy, risk tolerance, investment experience, income, investment objectives and access to ESG information may influence investment decisions. Therefore, the present study seeks to address this gap by examining **ESG awareness, perceptions and attitudes among India's young investors** and analysing whether ESG factors influence their financial decisions alongside traditional considerations such as risk, return, liquidity and capital appreciation, while also examining whether demographic and financial characteristics contribute to differences in ESG-oriented investment behaviour

Research Objectives:

1. To assess the level of awareness and understanding of ESG investing among young investors in India.
2. To examine the perceptions of young investors towards Environmental, Social and Governance factors in investment decisions.

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3. To identify the major factors influencing the financial decision-making of young investors, particularly ESG factors, risk, return and liquidity.
4. To analyse the influence of ESG considerations on the investment preferences and financial decision-making of young investors.

Research Methodology:

1. Research Design

The present study, titled "ESG Investing and Financial Decision-Making: A Study of India's Young Investors," adopts a descriptive and exploratory research design. The study aims to examine the awareness, perceptions and investment preferences of young investors towards Environmental, Social and Governance (ESG) factors and to understand their influence on financial decision-making. The study also examines the role of financial literacy in ESG-oriented investment behaviour.

Since the study is based on secondary data, it systematically reviews and analyses information available from published academic research, institutional reports, regulatory publications, ESG disclosures and other credible sources. The methodology is structured around the five research objectives to provide a comprehensive understanding of ESG investing among young investors in India.

2. Nature and Sources of Data

The study is based entirely on secondary data. No primary survey or questionnaire has been used for the collection of data. Secondary data has been obtained from reliable and relevant published sources, including:

- Research papers published in reputed national and international journals.
- Academic books and publications related to ESG investing, sustainable finance and investment behaviour.
- Reports and publications of the Securities and Exchange Board of India (SEBI).
- ESG, sustainability and Business Responsibility and Sustainability Reporting (BRSR) disclosures of listed Indian companies.

3. Data Collection

The secondary data was collected through a systematic review of existing literature and published reports relevant to the research objectives. The researcher reviewed studies dealing with ESG awareness, ESG perceptions, investment decision-making, risk and return preferences, financial literacy and responsible investment behaviour.

Published studies relating specifically to young investors and, wherever available, Indian investors were given greater importance. Relevant information was extracted from these sources and classified according to the five research objectives. The information collected was subsequently organised into themes to facilitate interpretation and comparison.

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Data Analysis and Interpretation:

The collected secondary data is analysed using descriptive and comparative analysis. Findings from previous empirical studies are compared to identify common patterns and differences in young investors' attitudes towards ESG investing.

The study analyses the importance given to ESG factors in comparison with traditional investment considerations such as risk, return and liquidity. It also examines evidence from previous studies regarding the relationship between financial literacy and responsible or ESG-oriented investment behaviour.

The findings reported by different researchers are systematically compared and synthesised to determine whether ESG awareness translates into actual investment preferences and financial decision-making. The analysis also helps identify the factors that may strengthen or limit the adoption of ESG-oriented investments among young investors in India.

Scope of the Study:

The study focuses on young investors in India and examines the relevance of ESG factors in their investment decision-making. The study covers all three dimensions of ESG:

- Environmental: Climate change, carbon emissions, pollution control, resource conservation and environmental sustainability.
- Social: Employee welfare, diversity, human rights, customer responsibility and community development.
- Governance: Corporate transparency, ethical practices, board accountability, shareholder rights and corporate governance.

The study also considers financial literacy, investment awareness and traditional financial considerations such as risk, return and liquidity in understanding ESG-oriented investment behaviour.

Limitations of the Study:

The study is subject to certain limitations because it is based exclusively on secondary data due to time constraint.

factors, and the role of financial literacy in ESG-oriented investment behaviour among young investors in India.

Conclusion:

The study on **"ESG Investing and Financial Decision-Making: A Study of India's Young Investors"** concludes that Environmental, Social and Governance considerations are becoming increasingly relevant in modern investment decision-making. The review of secondary data indicates that young investors are gradually becoming more conscious of sustainability, ethical business practices, corporate governance and the long-term impact of their investments. However, traditional investment factors such as risk, return, liquidity and capital appreciation continue to

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play an important role in their financial decisions. ESG awareness alone may not necessarily lead to ESG-oriented investment behaviour, as the ability to understand and evaluate ESG information is also important. Financial literacy therefore emerges as a significant factor that can help young investors interpret ESG disclosures, assess investment risks and make informed investment decisions. Overall, the study suggests that greater ESG awareness, financial literacy, transparent disclosures and reliable ESG information can encourage responsible and sustainable investment behaviour among India's young investors.

Suggestions:

1. **Increase ESG Awareness:** Educational institutions and financial institutions should conduct awareness programmes to educate young investors about ESG investing and its relevance to long-term investment decisions.
2. **Strengthen Financial Literacy:** ESG concepts should be incorporated into financial literacy programmes to help young investors understand sustainability-related investment opportunities and risks.
3. **Improve ESG Disclosure:** Companies should provide clear, transparent and easily understandable ESG and BRSR information to enable individual investors to make informed decisions.
4. **Promote Standardisation:** Greater standardisation of ESG reporting and disclosure practices should be encouraged to facilitate comparison between companies and investment products.
5. **Integrate ESG Information into Digital Platforms:** Investment apps and online platforms should provide accessible ESG ratings, sustainability indicators and relevant disclosures to support informed investment decisions.
6. **Encourage Further Research:** Future researchers should conduct primary studies among young investors across different regions of India to examine their actual ESG awareness, investment preferences and financial decision-making behaviour.

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A STUDY ON HYBRID WORK CULTURE AND SUSTAINABLE COMMUTING WITH RESPECT TO CORPORATE EMPLOYEES IN MUMBAI

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Abstract:
The hybrid work culture has strongly changed the way employees travel to their workplace. The results of the research named "A Study on Hybrid Work Culture and Sustainable Commuting with Respect to Corporate Employees in Mumbai" has been demonstrated in this paper. The paper studies how employees who travel less to work are more open to using public transport, carpooling, cycling and walking. The study also addresses the role of flexible working policies in employee's choice of transportation manner. The study adopts quantitative research. The research follows primary method of data collection from corporate employees in Mumbai via structured questionnaires. The study examines hybrid work and commuting from both human resource and sustainability perspective.
Keywords: *Hybrid Work, Sustainability, Commuting*

Introduction:

Nowadays, hybrid working practices are gaining popularity in the business world. This method is a combination of office and remote work, making the experience of work more flexible and thereby reducing time spent on commuting. The emergence of hybrid working activities allows us to learn about flexible working methods on the time spent commuting to work. Sustainable traveling is usually associated with the use of eco-friendly transportation means and energy-efficient techniques of transportation, e.g. mass transit and alternative modes of transportation. This is vital for Mumbai, where transportation takes quite a while and creates several issues, such as road congestions, fuel demand, air contamination, and others. The correlation among hybrid working practices and sustainable commuting is significant as less time spent at the office provides workers with the chance to choose eco-friendly means of traveling. The less time people spend commuting, the more likely to use public transport, carpooling, or cycling on the days when they need to go to their office. Thus, the research highlights the commuting tendencies of workers settled in Mumbai and analyses how hybrid working makes job holders turn towards sustainable commuting

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Need for the research:

The need for the research arises from the growing tendency of hybrid mode of work impacting the commuting routines of the workforce. The study emphasises to highlight the relationship between sustainable commuting and its impact on the different categories of labour. To tackle critical issues such as traffic congestion and pollution, we should consider whether reduced traveling frequency allows employees to make their choice in favour of public transport, car sharing, cycles, or walking. The study will also analyse the flexible working schemes from the perspective of HR and examine their impact on commuting behaviour

Review of Literature

1. **Puri and Singh** in their article "Sustainable Transportation – Evaluating the Determinants of Intention to Adopt Cycling as a Work Travel Mode" studied the motivations behind workers traveling via bikes as an eco-friendly mode of transportation in Mumbai. The researchers aimed to find different elements which influence the readiness of workers to go biking and, thereby, encourage them to use sustainable transportation. Ecological insight is found to be a significant element in the process of motivating people for cycling. The writers concluded that people who care about ecology will be more interested in cycling.
2. **Ramakrishnan et al. (2021)**, in the article "Joint Model of Sustainable Mode Choice for Commute, Shift Potential and Alternative Mode Chosen" enlists the various reasons that affect the decision made by employees regarding their sustainable travel mode of choice. Few complications found in the study is how some of those factors are contributing to the readiness of the staff to switch to climate friendly methods of traveling. The findings are relevant to the current paper as they indicate many behavioural and practical influences on traveling decisions made by workers.

Objectives of the Study:

1. To understand the adoption of sustainable transportation by corporate employees.
2. To evaluate the effect of flexible working policies on the usage of sustainable transportation technologies.

Hypothesis 1: Commute Frequency and Sustainable Transportation Adoption

Null Hypothesis (H_{01}): Commute frequency to the office has no significant relationship with corporate employees' willingness to adopt sustainable transportation in Mumbai.

Alternative Hypothesis (H_{11}): Lower commute frequency to the office significantly increases corporate employees' willingness to adopt sustainable transportation in Mumbai.

Hypothesis 2: Flexible Working Policies and Sustainable Transportation Adoption.

Null Hypothesis (H_{02}): Flexible working policies have no significant influences on corporate employee's willingness to adopt sustainable transportation in Mumbai.

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Alternative Hypothesis (H12): Flexible working policies significantly increase corporate employees' willingness to adopt sustainable transportation in Mumbai.

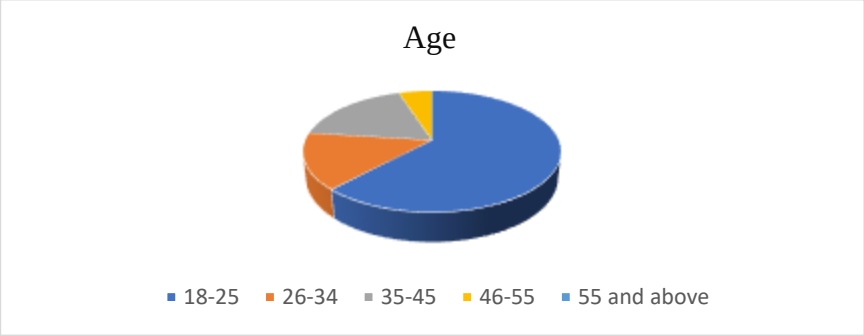
Research Methodology:

1. The primary data is collected through a well-structured set of questions from corporate employees in Mumbai. Focusing on their commuting practices and opinions over sustainable transportation.
2. The secondary data is extracted from numerous research papers, books, journals and digital articles over the internet.

Data Analysis:

1. Age

Age	Frequency	Percentage
18-25	62	62%
26-34	15	15%
35-45	18	18%
46-55	5	5%
55 and above	Nill	Nill
Total	**100**	**100**



According to the data, large proportion of respondents fall under the age group of 18-25, indicating young individuals employed at several levels of the organisation. The sample group in the 35-45 age subset accounts for the next highest number of responses. A large number of individuals are in the age segment of 26-34. Very few belong to the age section of 46-55.

2. Gender

Gender	Frequency	Percentage
Male	50	50%
Female	50	50%
Total	**100**	**100**

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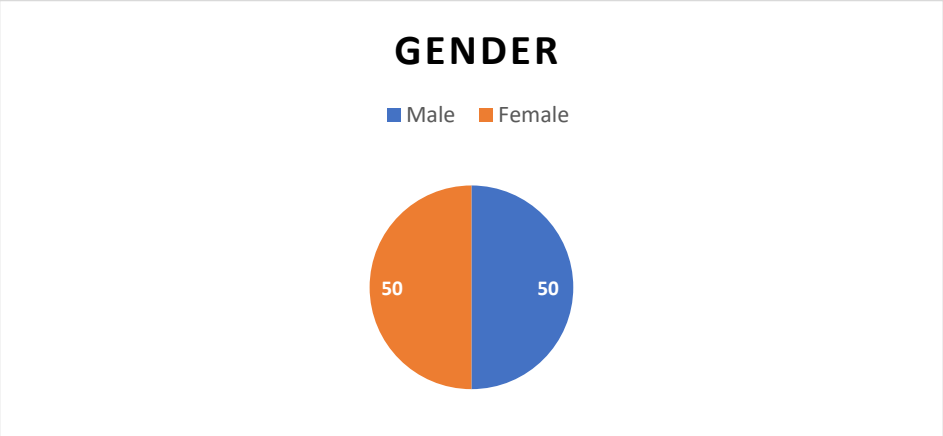

Both genders have equal number of respondents

3. Perception of Corporate employees in Mumbai on hybrid work culture and sustainable commuting

Ques No.	Statement	Yes (%)	No (%)
Q1.	Due to commuting fewer days a week, the willingness to use sustainable transportation is high	86	14
Q2.	Low commuting frequency has made me more conscious of choosing environmentally friendly transport.	87	13
Q3.	Lesser commuting days would stimulate me to use low carbon mobility	90	10
Q4.	Does your company provide flexible working conditions?	76	24
Q5.	My organisation offers a hybrid work policy	86	14
Q6.	Flexible working helps to avoid peak rush hours making sustainable transport more feasible	81	19
Q7.	Because my work hours are flexible, I am more willing to use the train/bus instead of a private vehicle.	83	17
Q8.	Rigid, fixed working hours discouraged me from using public transport, since delays could affect my punctuality	81	19
Q9.	Overall, flexible working policies at my organisation have positively influenced my willingness to adopt sustainable commuting	85	15

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Hypothesis Testing:

1. The hypothesis testing shows that almost 85 percent and above employees exhibit a higher inclination towards using sustainable transport modes for commuting. With this result we reject null hypothesis and accept the alternate hypothesis.
2. For the second hypothesis the results show a highly positive influence of flexible working policies on employees' willingness to adopt sustainable transport modes. Therefore, we reject the null hypothesis and accept the alternate hypothesis.

Data Interpretation:

The survey shows that nearly 86%- 90% of the participants upheld that a reduction in commute patterns enables them to be more receptive to using sustainable transit, in contrast, 81% believe that fixed working shifts inhibit public transport usage. It was also concluded that 85% of the study sample perceive that flexible working measures foster sustainable commuting. In general, the data obtained makes it clear that modified styles of commuting and flexible working strategies facilitate the decision of sustainable transport for employees of the corporate sector in Mumbai.

Suggestions:

1. Employers must focus on encouraging sustainable commuting amongst the employees. They can do this by providing their employees with travel bonuses or allowances, awareness programmes on the benefit of sustainable commuting
2. Enterprises can offer internal carpooling facilities to their personnel who reside in the same vicinity.

Conclusion:

The research reveals that hybrid work and flexible working frameworks influence sustainable commuting among corporate employees in Mumbai. The analysis indicated that employees commuting fewer days and having flexible working arrangements, are more likely to use communal transport and other sustainable and

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convenient mobility options, can help organisations to make commuting more sustainable and practical.

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AI MEETS ESG: ARE BUSINESS STUDENTS READY TO LEAD SUSTAINABLE ORGANIZATIONS

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Abstract:
Artificial Intelligence (AI) and Environmental, Social, and Governance (ESG) principles are becoming increasingly important in modern business organizations. AI is transforming the way organizations collect data, make decisions, manage resources, and identify business risks, while ESG focuses on sustainable practices, social responsibility, and ethical governance. The integration of AI with ESG has the potential to help organizations improve sustainability performance, reduce environmental impact, strengthen social responsibility, and support better decision-making. However, the successful implementation of AI-driven ESG practices depends not only on technology but also on the knowledge and skills of future business professionals. Business students, as future managers and leaders, need to understand both AI technologies and sustainability principles to make responsible and informed decisions. This research paper examines whether business students are adequately prepared to lead organizations where AI and ESG are increasingly interconnected. It focuses on students' awareness of AI and ESG, their understanding of sustainable business practices, their confidence in using technology for sustainability, and the skills they believe are necessary for future leadership. The study aims to identify existing knowledge gaps and highlight the importance of integrating AI, ESG, ethics, and sustainability into business education.
Key words: *Artificial Intelligence (AI), ESG, Business Sustainability, Sustainable Organizations, Business Students, ESG Competencies*

Introduction :

The business environment is changing rapidly due to technological development and increasing concerns about sustainability. Two major developments shaping modern organizations are Artificial Intelligence (AI) and Environmental, Social, and Governance (ESG). AI enables organizations to analyze large amounts of information, automate processes, identify patterns, and support decision-making. At the same time, ESG encourages businesses to consider their environmental impact, social responsibilities, and governance practices while pursuing economic growth.

The combination of AI and ESG can create new opportunities for sustainable business management. AI can help organizations monitor energy consumption, analyze

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environmental data, identify risks, improve resource efficiency, and support ESG reporting. It can also assist managers in making decisions based on large and complex datasets. However, the use of AI in sustainability also creates challenges related to data quality, transparency, privacy, bias, ethical decision-making, and responsible use of technology.

In this changing environment, business students are the future managers, entrepreneurs, and organizational leaders who will be responsible for making important business decisions. Therefore, their understanding of AI and ESG is becoming increasingly important. Knowing how to use technology alone may not be sufficient; future leaders must also understand sustainability, ethics, social responsibility, and the possible consequences of AI-driven decisions.

This research focuses on the question: Are business students ready to lead sustainable organizations in an AI-driven business environment? It examines students' awareness of AI and ESG, their understanding of sustainable business practices, their confidence in applying technology to sustainability-related decisions, and their perception of the skills required for future leadership. The study also seeks to identify areas where business education can be strengthened to prepare students for responsible and sustainable leadership.

Objectives :

1. To measure students' awareness of AI and ESG.
2. To assess students' attitude towards AI-driven sustainable business practices.

Hypothesis :

Null Hypotheses (H_0)

H_{01}: Students do not have a significant level of awareness of AI and ESG.

Alternative Hypotheses (H_1)

H_{11}: Students have a significant level of awareness of AI and ESG.

Null Hypotheses (H_0)

H_{02}: Students do not have a positive attitude towards AI-driven sustainable business practices.

Alternative Hypotheses (H_1)

H_{12}: Students have a positive attitude towards AI-driven sustainable business practices.

Review of Literature:

1. **Zabihollah Rezaee, Salem Boumediene, Saeid Homayoun and Salma Boumediene (2025)** found that Artificial Intelligence (AI) can play an important role in improving business sustainability, efficiency, innovation and growth. The study explains that AI, Generative AI and large language models can support sustainability initiatives and help organizations measure, analyse and report

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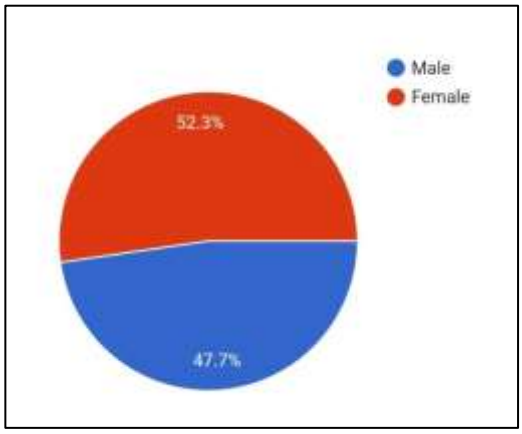
sustainability performance. AI can also help businesses optimize resource use, reduce environmental impact and improve corporate governance. The study provides practical insights and frameworks for integrating AI into sustainable business practices. Overall, the authors emphasize that responsible use of AI can help organizations achieve long-term sustainability and create value for stakeholders.

2. **Manish Gurung, Pawan Kumar, Deepa Verma and Shivani Nautiyal (2026)** examined how AI and digital platforms can enhance the development of Environmental, Social and Governance (ESG) competencies among organizational talent. The study used a quantitative research design and a structured survey to examine AI adoption, digital learning and organizational investment in ESG training. The findings suggest that AI and digital platforms can provide adaptive and real-time learning while making ESG education more accessible. However, the study also identified gaps in converting technological innovations into effective ESG outcomes. The study therefore highlights the importance of effective digital learning and practical training for developing ESG-ready professionals.
3. **R. Velmurugan, J. Sudarvel, R. Bhuvaneswari and Ravi Thirumalaisamy (2026)** found that the growing importance of ESG in business has created a need for specialized sustainability skills among professionals. The study explains that executive programmes and short courses developed with industry partners can bridge the gap between traditional education and changing industry requirements. These programmes provide practical knowledge in areas such as sustainability reporting, climate risk, ethical governance and stakeholder engagement. Case studies, simulations and projects help learners apply ESG concepts in real-world situations. Overall, the study emphasizes that university-industry partnerships, certifications and online learning can help develop skilled professionals capable of contributing to sustainable organizations.

Data Collection and Observation:

Gender:



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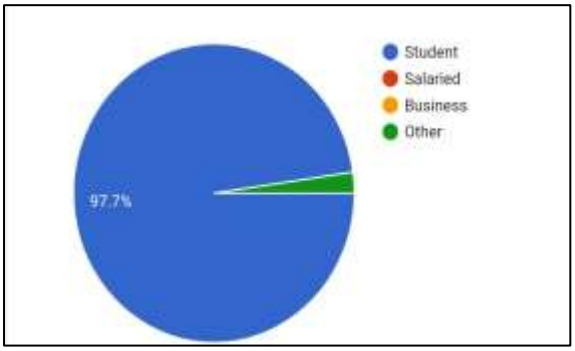
Options	Percentage
Male	47.7%
Female	52.3%

Interpretation: The chart shows that 52.3% of the respondents are female, while 47.7% are male. The responses are fairly balanced between both genders, with females representing a slightly higher proportion. This indicates that the study includes views from both male and female respondents

Occupation :

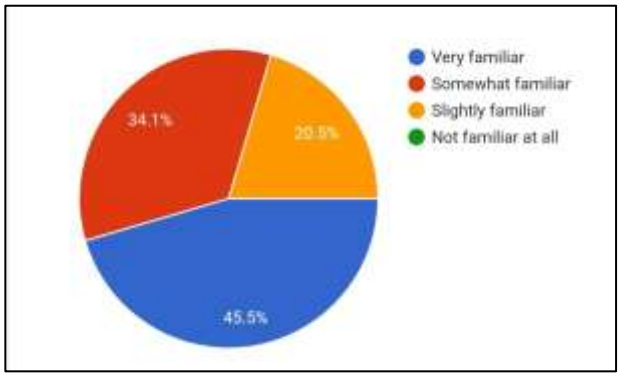


Option	Percentage
Student	**97.7%**
Salaried	
Business	
Other	**2.3%**

Interpretation: The chart indicates that 97.7% of the respondents are students, while 2.3% belong to other occupations. This shows that the study primarily represents the perspectives of students. Therefore, the findings mainly reflect the awareness and opinions of the student population.

1. How familiar are you with Artificial Intelligence (AI) ?

Option	Percentage
Very familiar	45.5%
Somewhat familiar	34.1%
Slightly familiar	20.5%



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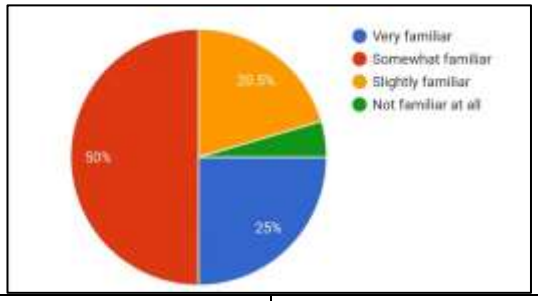
Not familiar at all	0

Interpretation: The results show that 45.5% of respondents are very familiar with AI, while 34.1% are somewhat familiar. Another 20.5% are slightly familiar, and none reported being completely unfamiliar. Overall, the findings indicate a good level of awareness and familiarity with AI among the respondents.

2. How familiar are you with ESG (Environmental, Social and Governance)?

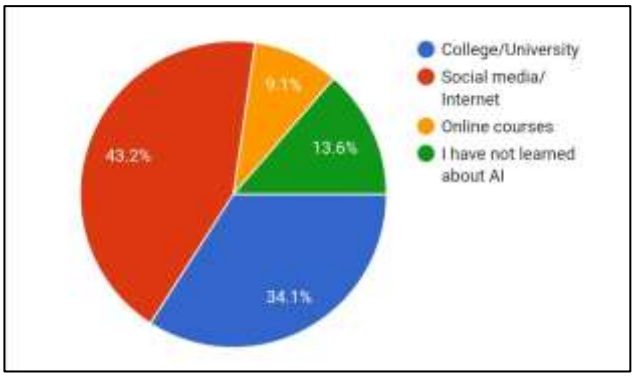


Option	**Percentage**
Very familiar	25%
Somewhat familiar	**50%**
Slightly familiar	**20.5%**
Not familiar at all	**4.5%**

Interpretation: The chart shows that 50% of respondents are somewhat familiar with ESG, while 25% are very familiar. About 20.5% are slightly familiar and 4.5% are not familiar at all. This suggests that although most respondents have some awareness of ESG, their understanding may not be as strong as their familiarity with AI.

3. Where have you mainly learned about Artificial Intelligence?

Options	**Percentage**
College/University	34.1%
Social media/Internet	43.2%
Online courses	9.1%
I have not learned about AI	13.6%



Interpretation The findings indicate that social media and the Internet are the main sources of AI-related knowledge, accounting for 43.2% of responses. College

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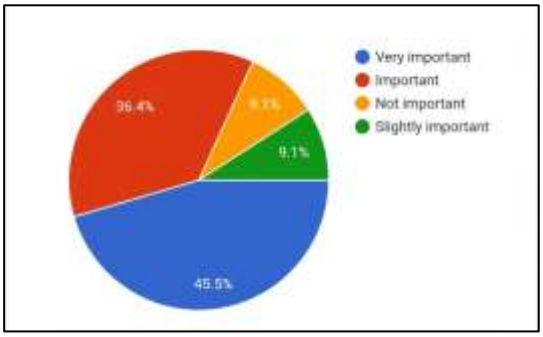
or university is the second major source at 34.1%, followed by online courses at 9.1%. However, 13.6% stated that they have not learned about AI, highlighting a need for greater AI awareness.

4. How important do you think AI is for achieving business sustainability?

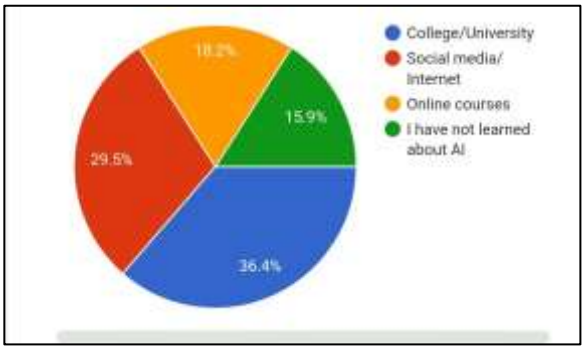
Options	Percentage
Very important	45.5%
Important	36.4%
Not important	9.1%
Slightly important	9.1%



Interpretation: The chart shows that 45.5% of respondents consider AI very important for achieving business sustainability, while 36.4% consider it important. Only 9.1% selected each of the less-important categories. Thus, the majority of respondents recognize AI as an important tool for supporting sustainable business practices.

5. Where have you mainly learned about ESG and sustainability?

Options	**Percentage**
College/University	36.4%
Social media/Internet	29.5%
Online courses	18.2%
I have not learned about AI	15.9%



Interpretation: The results show that college or university is the main source of knowledge about ESG and sustainability, accounting for 36.4% of responses. Social media and the Internet contribute 29.5%, while 18.2% learned through

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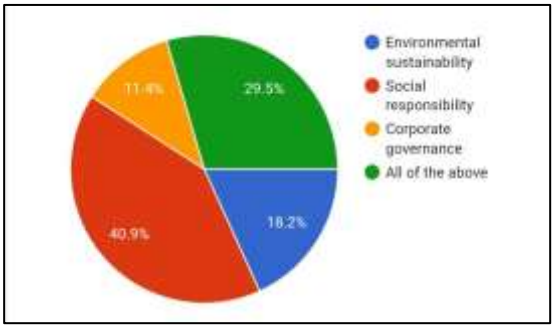
online courses. Interestingly, 15.9% reported that they have not learned about ESG, indicating a scope for further awareness and education.

6. Which ESG area do you think AI can contribute to the most?

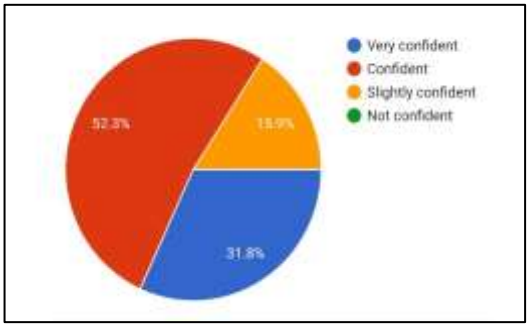
Options	Percentage
Environmental sustainability	18.2%
Social responsibility	40.9%
Corporate governance	11.4%
All of the above	29.5%



Interpretation: The chart indicates that 40.9% of respondents believe AI can contribute the most to social responsibility. Around 29.5% believe AI can contribute to all three ESG areas, while 18.2% selected environmental sustainability. Corporate governance received 11.4%, showing that respondents see AI as having a broad role in ESG, particularly in social responsibility.

7. How confident are you in using AI tools for business-related tasks?

Options	Percentage
Very confident	31.8%
Confident	52.3%
Slightly confident	15.9%
Not confident	0



Interpretation: The findings show that 52.3% of respondents are confident in using AI tools for business-related tasks, while 31.8% are very confident. A further 15.9% are slightly confident, and none reported being not confident. This indicates a generally positive level of confidence in applying AI to business activities.

8. How willing would you be to learn AI-based tools for sustainable business practices?

Options	Percentage

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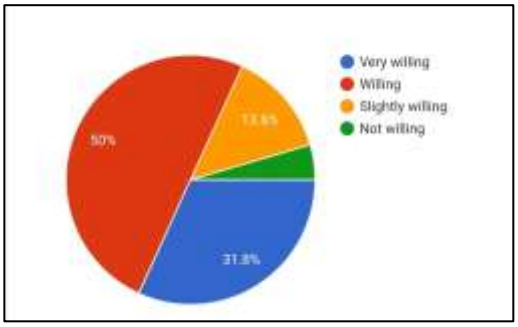
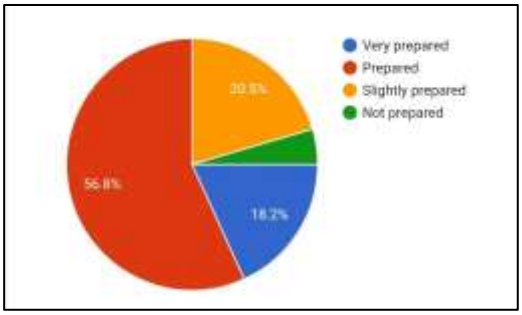
Very willing	31.8%
Willing	50%
Slightly willing	13.6%
Not willing	4.5%



Interpretation The chart shows that 50% of respondents are willing to learn AI-based tools for sustainable business practices, while 31.8% are very willing. About 13.6% are slightly willing and only 4.5% are not willing. Overall, the results demonstrate a strong willingness among respondents to develop AI-related skills for sustainable business.

9. How prepared do you feel to work with AI-driven sustainable business practices?

Options	**Percentage**
Very prepared	18.2%
Prepared	56.8%
Slightly prepared	20.5%
Not prepared	4.5%



Interpretation: The results indicate that 56.8% of respondents feel prepared to work with AI-driven sustainable business practices, while 18.2% feel very prepared. Another 20.5% are slightly prepared and only 4.5% are not prepared. This suggests that most respondents have a positive level of readiness, although additional training could improve their preparedness further.

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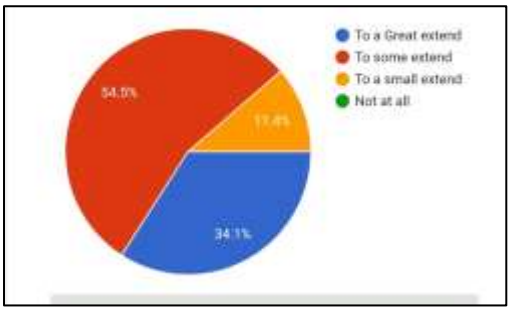
10. How much do you think AI can help businesses reduce their environmental impact?

Options	Percentage
To a Great extend	34.1%
To some extend	54.5%
To a small extend	11.4%
Not at all	0



Interpretation: The chart shows that 54.5% of respondents believe AI can help businesses reduce their environmental impact to some extent, while 34.1% believe it can do so to a great extent. Around 11.4% feel that AI can contribute only to a small extent. Overall, the findings indicate that most respondents believe AI can play a positive role in reducing environmental impact.

Conclusion:

The integration of Artificial Intelligence (AI) and Environmental, Social, and Governance (ESG) principles is becoming increasingly important for modern business organizations. AI has the potential to support sustainable business practices by helping organizations analyse large amounts of data, monitor environmental performance, improve resource efficiency, identify risks, and strengthen decision-making. At the same time, ESG provides a framework for businesses to consider environmental responsibility, social well-being, ethical practices, and effective governance.

The study highlights that business students, as future managers, entrepreneurs, and leaders, need more than basic technological knowledge. They must also understand sustainability, ethics, social responsibility, and the consequences of AI-driven decisions. The literature reviewed shows that AI and digital platforms can support ESG learning, but there are still gaps in converting technological knowledge into effective sustainability outcomes. Practical training, digital learning, case studies, simulations, certifications, and industry partnerships can help students develop the skills required by changing business environments.

However, responsible use of AI is essential. Issues such as data quality, transparency, privacy, bias, and ethical decision-making must be addressed while applying AI to sustainability. Therefore, business education should create a balance between technological capabilities and responsible leadership.

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Overall, business students can become effective leaders of sustainable organizations when their education combines AI knowledge with ESG awareness, ethical thinking, and practical skills. Strengthening AI and ESG education can help prepare students to make informed decisions, manage emerging challenges, and contribute to organizations that create long-term value for both stakeholders and society.

References:

1. ***Gurung, M., Kumar, P., Verma, D., & Nautiyal, S. (2026).*** *AI and digital platforms for developing ESG competencies among organizational talent. The study examines how AI and digital platforms support ESG learning, training and competency development. It highlights adaptive learning, real-time education and the importance of practical training for developing ESG-ready professionals.*
2. ***Rezaee, Z., Boumediene, S., Homayoun, S., & Boumediene, S. (2025****). Artificial Intelligence and business sustainability. The study explores the role of AI, Generative AI and large language models in improving business sustainability, efficiency, innovation and growth. It explains how AI can support sustainability measurement, reporting, resource optimization, environmental impact reduction and corporate governance.*
3. ***Velmurugan, R., Sudarvel, J., Bhuvaneswari, R., & Thirumalaisamy, R. (2026).*** *sustainable organizations Developing sustainability skills and ESG competencies among business professionals. The study focuses on the growing demand for specialized ESG skills and the role of executive programmes, certifications, online learning and university-industry partnerships. It emphasizes practical learning through case studies, simulations and projects to prepare professionals for****.***

Appendix:

1. How familiar are you with Artificial Intelligence (AI)?
   - Very familiar
   - Somewhat familiar
   - Slightly familiar
   - Not familiar at all
2. How familiar are you with ESG (Environmental, Social and Governance)?
   - Very familiar
   - Somewhat familiar
   - Slightly familiar
   - Not familiar at all
3. Where have you mainly learned about Artificial Intelligence?
   - College/University
   - Social media/Internet
   - Online courses

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- I have not learned about AI

4. Where have you mainly learned about ESG and sustainability?
   - College/University
   - Social media/Internet
   - Workshops/Seminars
   - I have not learned about ESG
5. How important do you think AI is for achieving business sustainability?
   - Very important
   - Important
   - Slightly important
   - Not important
6. Which ESG area do you think AI can contribute to the most?
   - Environmental sustainability
   - Social responsibility
   - Corporate governance
   - All of the above

7. How confident are you in using AI tools for business-related tasks?
   - Very confident
   - Confident
   - Slightly confident
   - Not confident
8. How willing would you be to learn AI-based tools for sustainable business practices?
   - Very willing
   - Willing
   - Slightly willing
   - Not willing
9. How prepared do you feel to work with AI-driven sustainable business practices?
   - Very prepared
   - Prepared
   - Slightly prepared
   - Not prepared
10. How much do you think AI can help businesses reduce their environmental impact?
    - To a great extent
    - To some extent
    - To a small extent
    - Not at all

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11. How much do you trust AI in supporting business decisions related to ESG?
    - Completely trust
    - Mostly trust
    - Slightly trust
    - Do not trust
12. What do you think is the biggest challenge in using AI for sustainable business practices?
    - Data privacy and security
    - High implementation cost
    - Lack of skilled employees
    - Ethical concerns
13. How important should knowledge of AI and ESG be for business students?
    - Very important
    - Important
    - Slightly important
    - Not important
14. How likely are you to use AI for sustainability-related tasks in your future career?
    - Very likely
    - Likely
    - Unlikely
    - Very unlikely
15. Overall, how ready do you think business students are to lead AI-driven sustainable organizations?
    - Very ready
    - Ready
    - Somewhat ready
    - Not ready

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AI-DRIVEN SUSTAINABLE ENTREPRENEURSHIP: EXPLORING THE ESG JOURNEY OF GREEN START-UP

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Abstract:

The rapid growth of artificial intelligence (AI) has created new opportunities for entrepreneurs to develop innovative and sustainable solutions to environmental and social challenges. At the same time, increasing awareness of climate change, resource scarcity, ethical business practices, and corporate responsibility has made Environmental, Social, and Governance (ESG) principles an important part of modern entrepreneurship. This study, titled ***"AI-Driven Sustainable Entrepreneurship: Exploring the ESG Journey of Green Start-ups,"*** *aims to examine how artificial intelligence can support green start-ups in incorporating ESG principles into their business models, operations, decision-making processes, and long-term growth strategies. Green start-ups play an important role in promoting sustainable development by developing products, services, and technologies that reduce environmental damage while creating economic value. However, these enterprises often face challenges such as limited financial resources, lack of skilled personnel, difficulty in measuring sustainability performance, uncertain market conditions, and limited access to advanced technologies. AI can help overcome some of these challenges by enabling data-driven decision-making, predictive analysis, automation, efficient resource management, environmental monitoring, customer analysis, and risk assessment. The application of AI can therefore contribute to reducing energy consumption, minimizing waste, optimizing supply chains, improving operational efficiency, and identifying opportunities for sustainable innovation. The study particularly explores the* ***Environmental, Social, and Governance dimensions*** *of the ESG framework. From an environmental perspective, AI can help green start-ups monitor carbon emissions, manage energy consumption, optimize the use of raw materials, and reduce waste. From a social perspective, AI can contribute to improved customer engagement, employee management, workplace safety, accessibility, and the development of socially responsible products and services. From a governance perspective, AI can support transparent reporting, risk management, compliance monitoring, fraud detection, and more informed strategic decision-making. The study also recognizes that AI itself may create challenges related to data privacy, algorithmic bias, cybersecurity, energy consumption, and ethical decision making, which must be addressed responsibly. The research aims to understand the extent to which green start-ups are adopting AI-based tools and how*

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these technologies influence their ESG performance and sustainable entrepreneurial practices.

Keyword: *Artificial Intelligence (AI), Sustainable Entrepreneurship, Green Start-ups, ESG (Environmental, Social and Governance) ,Environmental Sustainability , Social Responsibility*

Introduction:

In recent years, the business environment has undergone significant changes due to rapid technological development, increasing environmental concerns, and growing awareness of social responsibility. Entrepreneurs are no longer expected to focus only on profitability and business expansion. Modern businesses are increasingly required to consider their impact on the environment, society, employees, customers, investors, and other stakeholders. This shift has led to the emergence of **sustainable entrepreneurship**, where entrepreneurs aim to create economic value while simultaneously addressing environmental and social challenges. Green start-ups have become an important part of this movement because they develop innovative products, services, and business models that contribute to environmental sustainability and responsible economic growth.At the same time, **Artificial Intelligence (AI)** has emerged as one of the most influential technologies transforming the modern business ecosystem. AI enables businesses to collect and analyse large amounts of data, automate processes, predict future trends, identify risks, improve decision-making, and develop innovative solutions. For start-ups, particularly those operating in the green and sustainability sector, AI can provide valuable opportunities to improve operational efficiency, reduce costs, optimize resources, understand customer needs, and develop environmentally friendly solutions. The combination of AI and sustainable entrepreneurship has therefore created a new approach known as **AI-driven sustainable entrepreneurship**. AI-driven sustainable entrepreneurship refers to the use of artificial intelligence technologies to support entrepreneurial activities while achieving economic, environmental, and social objectives. AI can help green start-ups make better use of limited resources and improve their ability to address sustainability-related problems. For example, AI-powered systems can help businesses monitor energy consumption, predict equipment failures, optimize transportation routes, reduce material waste, analyse carbon emissions, and improve supply-chain efficiency. In agriculture, AI can support precision farming and reduce excessive use of water and fertilizers, while in manufacturing it can assist in reducing waste and improving energy efficiency. Thus, AI can act as an important enabler of sustainable innovation. An important framework for evaluating sustainable business practices is **Environmental, Social, and Governance (ESG)**. ESG represents three major

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dimensions of responsible business performance. The **Environmental** dimension focuses on issues such as climate change, carbon emissions, energy efficiency, waste management, pollution control, conservation of natural resources, and sustainable use of materials. The **Social** dimension focuses on employees, customers, communities, human rights, diversity, inclusion, health and safety, and social well-being. The **Governance** dimension relates to ethical leadership, transparency, accountability, regulatory compliance, risk management, data protection, and responsible decision-making. For green start-ups, ESG is particularly important because their success is not determined only by their ability to generate profits but also by the positive impact they create. Investors, consumers, employees, governments, and other stakeholders are increasingly interested in whether businesses operate responsibly and transparently. A green start-up that effectively incorporates ESG principles can strengthen its reputation, attract responsible investors, build customer trust, reduce business risks, and create long-term value. However, implementing ESG practices can be difficult for early-stage businesses because they often operate with limited financial resources, small teams, insufficient expertise, and limited access to reliable sustainability data. AI can potentially help green start-ups overcome some of these challenges. AI-based analytical tools can collect and process sustainability-related information, identify patterns, measure performance, and provide insights for decision-making. For example, AI can assist a start-up in tracking its carbon footprint, identifying areas of excessive energy consumption, monitoring supply-chain risks, and evaluating the efficiency of its sustainability initiatives. AI can also support ESG reporting by organizing large amounts of information and identifying relevant performance indicators. Consequently, the integration of AI with ESG practices can make sustainability management more systematic, measurable, and data-driven. The **ESG journey of a green start-up** can be understood as a continuous process rather than a one-time activity. It may begin with identifying environmental and social challenges, followed by developing sustainable products or services and establishing responsible business practices. As the business grows, it may introduce ESG objectives, measure sustainability performance, engage with stakeholders, improve governance systems, and communicate its progress. AI can support different stages of this journey by providing data-driven insights and helping entrepreneurs monitor and improve their ESG performance. However, the successful use of AI requires appropriate infrastructure, skilled employees, quality data, ethical guidelines, and responsible governance. Despite its potential benefits, AI adoption also creates new challenges for sustainable entrepreneurship. AI systems may require significant amounts of computing power and energy, which can contribute to environmental impacts. Issues such as data privacy, cybersecurity, algorithmic bias, lack of transparency, and

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ethical use of technology can also affect the social and governance dimensions of ESG. Therefore, simply adopting AI does not automatically make a business sustainable. Entrepreneurs must ensure that AI technologies are implemented responsibly and that their benefits outweigh their potential negative impacts. The relationship between AI, sustainable entrepreneurship, and ESG is therefore becoming increasingly important for the future of business. Green start-ups have the potential to use emerging technologies to address environmental problems while creating employment, economic opportunities, and social value. At the same time, ESG principles can provide a framework through which these businesses can evaluate it.

The integration of AI and ESG can help entrepreneurs move beyond traditional business objectives and develop innovative solutions that balance **profitability, environmental protection, social responsibility, and ethical governance**. It examines the potential contribution of AI to environmental efficiency, social responsibility, and effective governance. The study also considers the challenges and limitations associated with AI adoption and ESG implementation among emerging businesses. By exploring this relationship, the study aims to provide a better understanding of how technology-driven entrepreneurship can contribute to sustainable business development. Overall, AI-driven sustainable entrepreneurship represents an important intersection between **technology, innovation, entrepreneurship, and sustainability**. Green start-ups can use AI not only as a tool for improving business performance but also as a means of creating measurable environmental and social value. When combined with strong ESG principles and responsible governance, AI has the potential to help young businesses become more resilient, competitive, transparent, and sustainable. Therefore, understanding the ESG journey of AI-driven green start-ups is essential for identifying how emerging businesses can contribute to a more responsible and sustainable future.

Objectives & Hypothesis:

Objective 1: To examine the role of AI in promoting sustainable entrepreneurship.

- **H_{01} (Null Hypothesis):** There is **no significant relationship** between the adoption of Artificial Intelligence and sustainable entrepreneurship among green start-ups.
- **H_{11} (Alternative Hypothesis):** There is a **significant relationship** between the adoption of Artificial Intelligence and sustainable entrepreneurship among green start-ups.

Objective 2: To study the contribution of AI-driven technologies to ESG practices.

- **H_{02} (Null Hypothesis):** AI-driven technologies have **no significant impact** on the Environmental, Social, and Governance (ESG) practices of green start-ups.

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- **H_{12} (Alternative Hypothesis):** AI-driven technologies have a **significant positive impact** on the Environmental, Social, and Governance (ESG) practices of green start-ups.

Objective 3: To identify the opportunities and challenges faced by green start-ups in adopting AI for sustainable business development.

- **H_{03} (Null Hypothesis):** There is **no significant relationship** between AI adoption and the sustainable business development, innovation, and competitiveness of green start-ups.
- **H_{13} (Alternative Hypothesis):** There is a **significant positive relationship** between AI adoption and the sustainable business development, innovation, and competitiveness of green start-ups.

Review of Literature:

1. **MdRajbul (2024)** examined that the study examines how AI supports sustainable entrepreneurship and green business practices. It highlights AI's role in optimizing resources, reducing environmental impact, and achieving SDGs. The findings show that AI provides opportunities for businesses to become more sustainable, while also presenting challenges in adoption. Overall, AI has strong potential to promote sustainable business development and environmental responsibility.
2. **Hamza Younus (2025)** examined that the study examines how AI and ESG integration can support sustainable development and corporate governance. It finds that AI can improve environmental monitoring, stakeholder engagement, and ethical decision-making. The research shows a positive relationship between AI investment and ESG performance, especially in technology-intensive industries. Overall, it highlights AI as a strategic tool for responsible and sustainable business practices.
3. **Xiaxoi Zhang (2025)**examine that the abstract explains how AI is driving corporate sustainable development by improving resource efficiency and reducing carbon emissions. It highlights AI applications in energy optimization, supply-chain management, carbon tracking, and product lifecycle management. The study shows that AI can support green innovation and help businesses achieve ESG goals. Overall, AI is presented as a key tool for building more efficient, resilient, and sustainable businesses.
4. **Vikesh Sharma (2021)** found thatThe study examines household energy use and cooking preferences in rural India, focusing on the shift from traditional solid fuels to cleaner energy sources like LPG. It finds that income, education, employment, housing conditions, and access to reliable fuel strongly influence energy choices. Many households still depend on solid fuels, creating health and environmental risks. The study suggests that policies such as Pradhan MantriUjjwalaYojana (PMUY), better access to clean energy, awareness programs,

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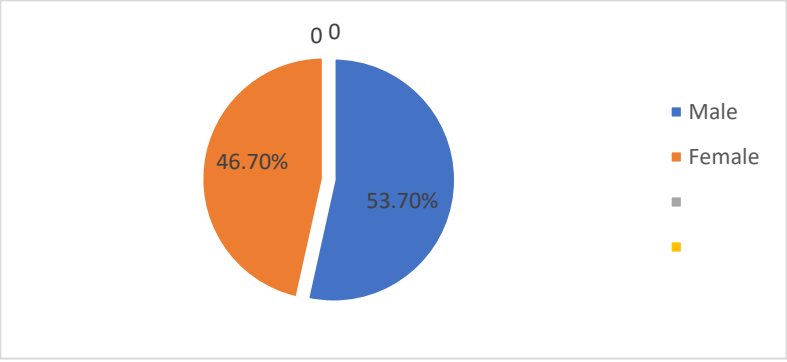
and alternative income opportunities can encourage sustainable fuel use and improve health and living conditions.

5. **Amina A. khaddam (2025)**found thatThe abstract reviews how Artificial Intelligence (AI) and Business Intelligence (BI) are being used to improve energy management and ESG (Environmental, Social and Governance) performance. It finds that AI helps companies automate ESG reporting, monitor energy use in real time, predict energy demand, and reduce carbon emissions and costs. However, challenges such as data quality, privacy, bias, and ethical concerns remain. The study concludes that AI-driven BI can support sustainable business decisions, but organizations need strong governance and reliable data systems for effective implementation.
6. **Barlet ,C, and Roser ,A.M.(2024)**examine that the abstract explains how Artificial Intelligence (AI) can support sustainable business innovation, especially in the areas of finance and marketing. The study uses a meta-analysis of existing research to examine how AI technologies such as Machine Learning, neural networks, and Generative AI can improve sustainability and digital transformation. It highlights the need to integrate AI with business strategies, organizational structures, and ethical practices. The study also discusses challenges such as data quality, ethics, and organizational readiness. Overall, it concludes that effective use of AI can promote digital transformation, sustainable practices, and long-term value creation in businesses.

Data Collection and Observation:

Gender:

Options	Percentage
Male	53.7%
Female	46.3%



Interpretation: The results indicate that males make up a slightly larger proportion of the respondents than females. Specifically, 53.7% were male, while 46.3% were

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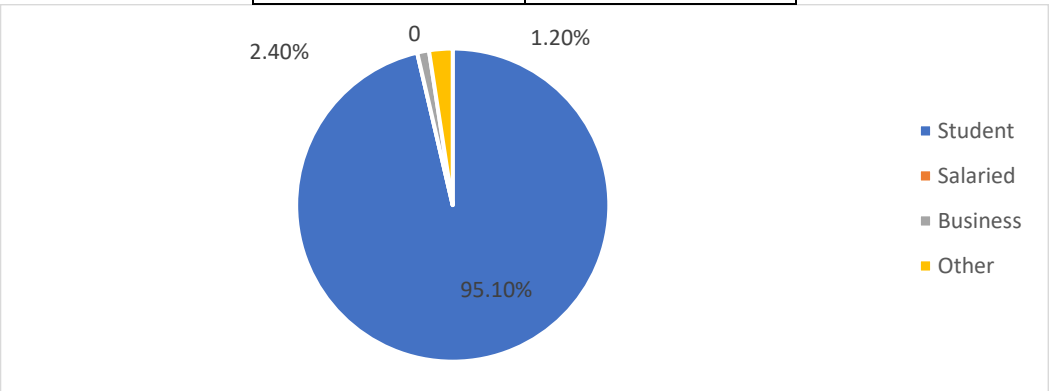
female, showing a relatively balanced gender distribution, with males representing a small majority.The difference between male and female respondents is 7.4 percentage points, indicating that the gender distribution is relatively balanced. Although males form a small majority, the proportion of females is also substantial. Therefore, the data suggests that the study included perspectives from both genders fairly well, with only a slight predominance of male respondents.

Occupation:

Options	Percentage
Student	95.1%
Salaried	1.2%
Business	1.2%
Other	2.4%



Interpretation: The findings indicate that students form the dominant group, accounting for 95.1% of the total respondents. In comparison, salaried employees and respondents involved in business each represent only 1.2%, while 2.4% belong to other occupational categories. Overall, the sample is heavily dominated by students, suggesting that the findings of the study are likely to reflect the opinions and experiences of students more strongly than those of working professionals or businesspeople.Overall, the chart indicates a highly student-dominated sample, with students representing more than nine-tenths of all respondents. The participation of salaried employees, businesspeople, and other occupational groups is comparatively very low.

1. **To what extent do you think AI helps business to reduce their environmental impact ?**

Options	Percentage
To some extent	36.6%
To little extent	30.5%
To a great extent	29.3%
Not at all	3.7%

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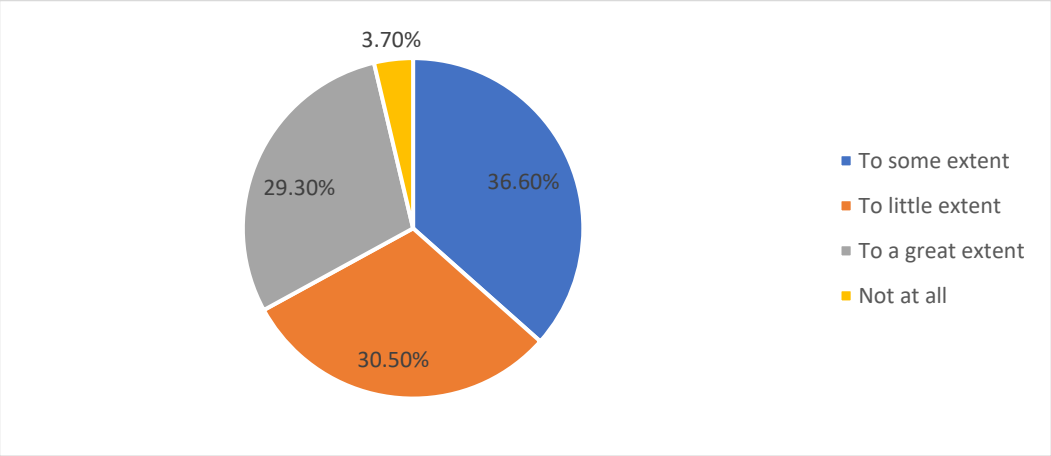
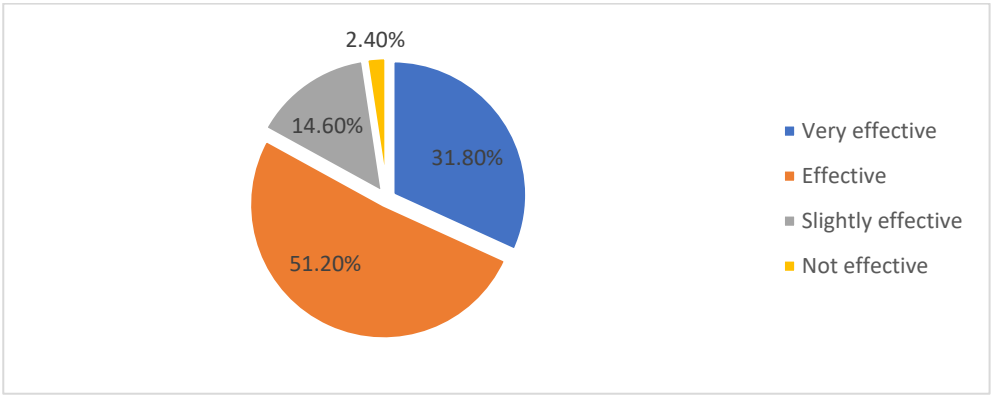


Interpretation: Overall, the chart indicates a generally positive perception of AI's environmental benefits. Most respondents (96.4%) believe that AI contributes to reducing businesses' environmental impact to at least some extent, although only 29.3% consider its contribution to be substantial. This suggests that people recognize AI's potential for environmental sustainability but may still have reservations about the magnitude of its impact.

2. How effective is AI helping entrepreneurs identify sustainable business opportunities?

Options	Percentage
Very effective	31.7%
Effective	51.2%
Slightly effective	14.6%
Not effective	2.4%



Interpretation: Overall, the findings indicate a highly positive perception of AI among entrepreneurs. A combined 82.9% of respondents consider AI either effective or very effective in identifying sustainable business opportunities. This suggests that AI is increasingly viewed as a useful tool for discovering and evaluating opportunities that can support sustainable entrepreneurship. Only a very small proportion (2.4%) do not find AI effective for this purpose.

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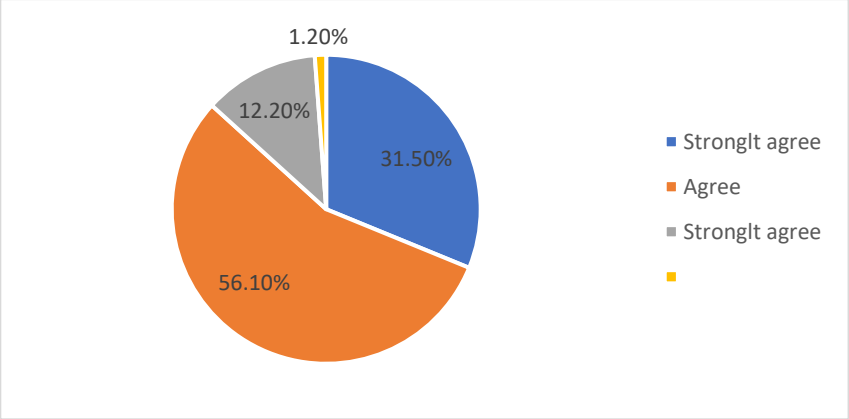
3. Does AI help entrepreneurs reduce wastage of resources such as energy, materials ,and time?

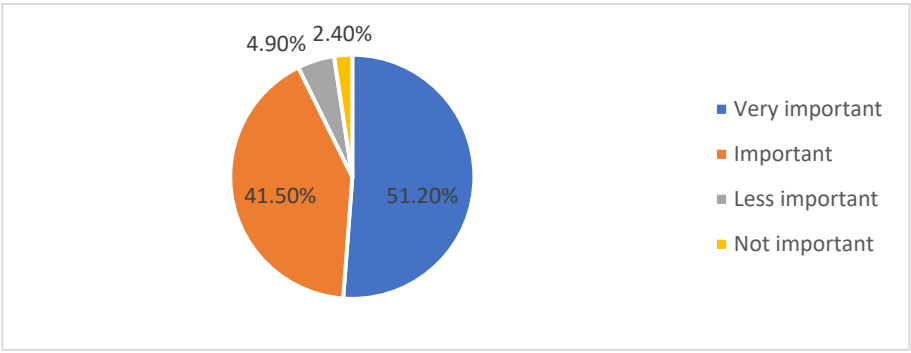
Options	Percentage
Strongly agree	30.5%
Agree	56.1%
Disagree	12.2%
Strongly disagree	1.2%



Interpretation: The chart shows that most respondents believe AI helps entrepreneurs reduce wastage of resources such as energy, materials, and time. A majority of 56.1% agree, while 30.5% strongly agree, indicating a highly positive perception of AI's role in resource efficiency. On the other hand, 12.2% disagree and only 1.2% strongly disagree. Overall, the findings suggest that 86.6% of respondents have a positive view, supporting the idea that AI can help entrepreneurs improve efficiency and promote sustainable use of resources.

4. How important is AI for developing eco-friendly products and services?

Options	Percentage
Very important	51.2%
Important	41.5%
Less important	4.9%
Not important	2.4%



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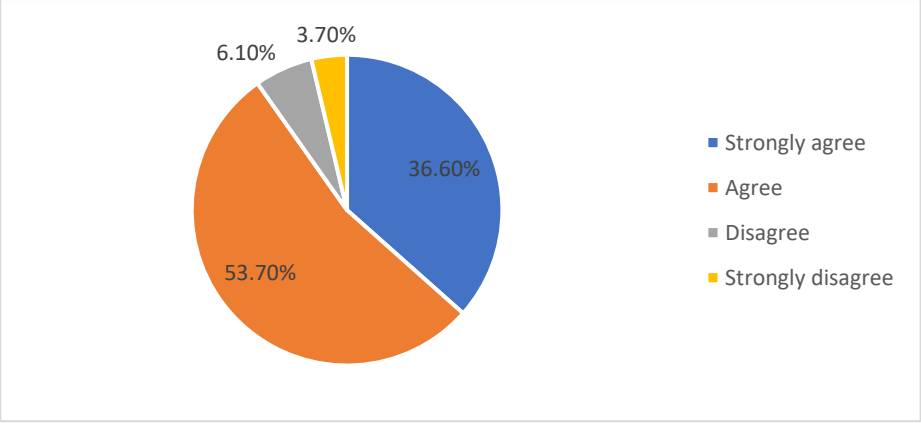
Interpretation: The chart shows that AI is considered highly important for developing eco-friendly products and services. A majority of respondents, 51.2%, consider AI very important, while 41.5% consider it important. Together, 92.7% of respondents have a positive view of AI's importance in promoting eco-friendly products and services. Only 4.9% consider it less important and 2.4% consider it not important. Overall, the findings indicate that most respondents recognize AI as an important tool for supporting sustainable innovation and the development of environmentally friendly products and services.

5.Do you believe AI can improve the long term sustainability and profitability of start ups?

Options	Percentage
Strongly agree	36.6%
Agree	53.7%
Disagree	6.1%
Strongly disagree	3.7%



Interpretation: The chart shows that most respondents believe AI can improve the long-term sustainability and profitability of start-ups. About 53.7% agree and 36.6% strongly agree, giving a combined positive response of 90.3%. Only 6.1% disagree and 3.7% strongly disagree with the statement. Overall, the findings indicate that respondents have a strongly positive perception of AI, suggesting that AI can help start-ups improve efficiency, reduce costs, support sustainable growth, and increase long-term profitability.

Options	Percentage
To a great extent	35.4%
To some extent	43.9%
To little extent	18.3%

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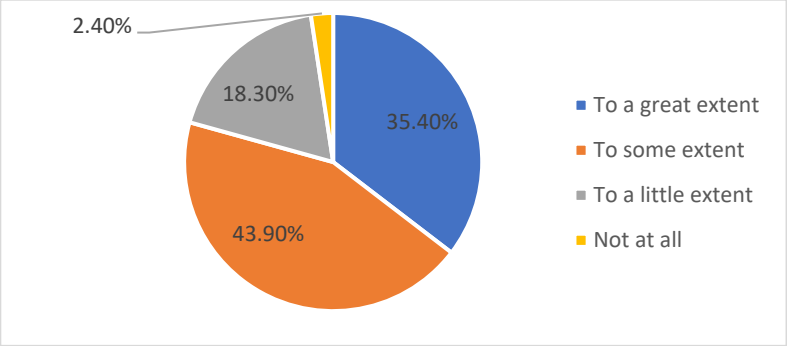
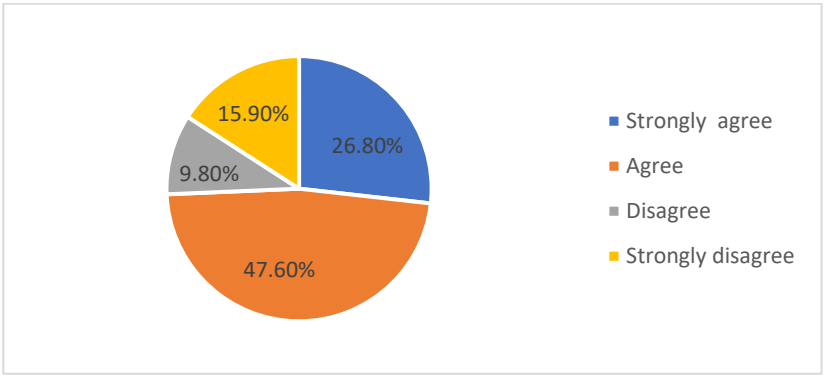
6.To what extent does AI help business monitor and reduce their environmental impact?	Not at all	2.4 %



Interpretation: The chart shows that AI helps businesses monitor and reduce their environmental impact to a significant extent. The largest group, 43.9%, believes AI helps to some extent, while 35.4% believe it helps to a great extent. Thus, 79.3% of respondents feel that AI contributes meaningfully to environmental impact reduction. Meanwhile, 18.3% believe it helps to a little extent and only 2.4% feel it does not help at all. Overall, the findings indicate that AI is widely perceived as a useful tool for businesses to monitor environmental performance, improve resource efficiency, and support sustainable practices.

7. Does AI improve transparency and accuracy in ESG reporting?

Options	Percentage
Strongly agree	26.8%
Agree	47.6%
Disagree	9.8%
Strongly disagree	15.9%



Interpretation: The chart shows that most respondents believe AI improves transparency and accuracy in ESG reporting. About 47.6% agree and 26.8% strongly agree, giving a combined positive response of 74.4%. On the other hand, 9.8% disagree and 15.9% strongly disagree. Overall, the findings indicate that a clear majority of respondents feel that AI can enhance the reliability, accuracy, and

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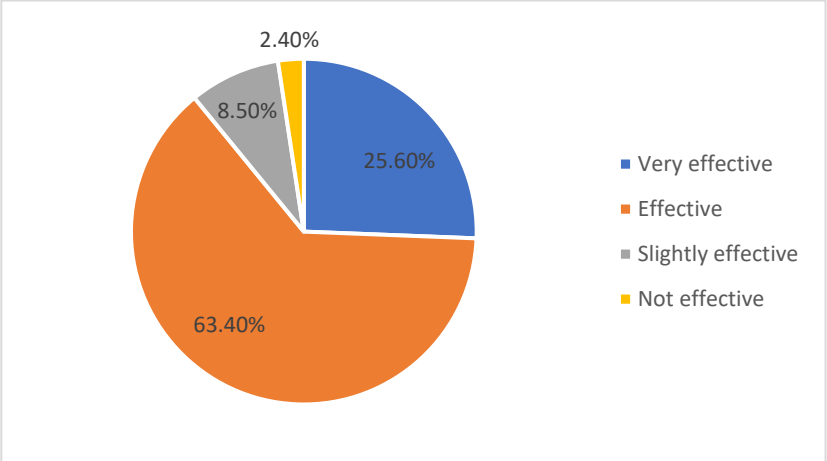
transparency of ESG reporting, although a notable minority still have concerns about its effectiveness.

8. How effectively can AI help companies identify social and work place related risks?

Options	Percentage
Very effective	25.6%
Effective	63.4%
Slightly effective	8.5%
Not effective	2.4%



Interpretation: The chart shows that most respondents believe AI is effective in helping companies identify social and workplace-related risks. A majority of 63.4% consider AI effective, while 25.6% consider it very effective. Together, 89% of respondents have a positive view of AI's effectiveness in identifying such risks. Only 8.5% consider it slightly effective and 2.4% believe it is not effective. Overall, the findings indicate that AI is widely perceived as a useful tool for identifying workplace issues, improving risk management, and supporting better social practices within companies.

9. Does AI support better corporate governance and decision making?

Options	Percentage
Strongly agree	24.4%
Agree	47.6%
Strongly disagree	12.2%
Disagree	15.9%

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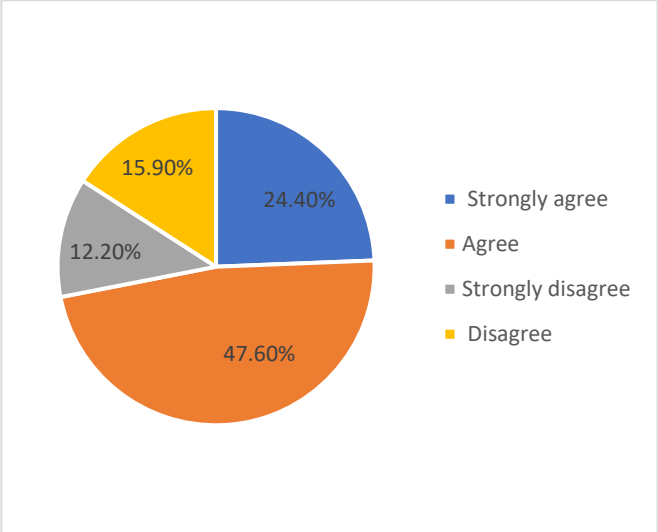
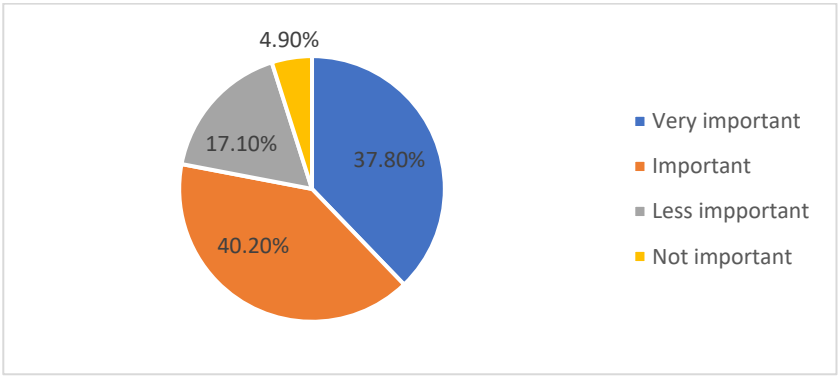


Interpretation: The chart shows that most respondents believe AI supports better corporate governance and decision-making. About 47.6% agree and 24.4% strongly agree, giving a combined positive response of 72%. In comparison, 15.9% disagree and 12.2% strongly disagree. Overall, the findings indicate that a clear majority of respondents feel that AI can improve corporate governance and support more informed, efficient, and effective decision-making, although some respondents remain cautious about its role.

10. How important is AI in helping business achieve their ESG goals?

Options	Percentage
Very important	37.8%
Important	40.2%
Less important	17.1%
Not important	4.9%



Interpretation: The chart shows that AI is considered important in helping businesses achieve their ESG (Environmental, Social and Governance) goals. The largest group, 40.2%, considers AI important, while 37.8% consider it very important. Together, 78% of respondents believe AI plays an important role in

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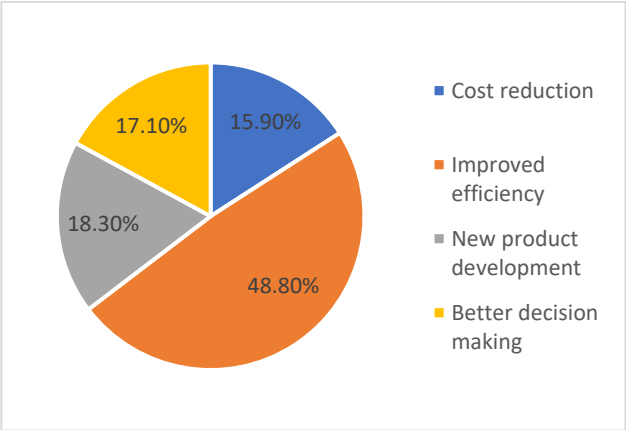
achieving ESG goals. Meanwhile, 17.1% consider it less important and only 4.9% consider it not important. Overall, the findings indicate that a strong majority of respondents recognize AI as a valuable tool for supporting sustainable business practices and achieving ESG objectives.

11. What is the biggest opportunity AI provides to green start ups?

Options	Percentage
Cost reduction	15.9%
Improved efficiency	48.8%
New product development	18.3%
Better decision making	17.1%



Interpretation: The chart shows that improved efficiency is considered the biggest opportunity AI provides to green start-ups, with 48.8% of respondents selecting this option. New product development is identified by 18.3%, followed by better decision-making at 17.1% and cost reduction at 15.9%. Overall, the findings indicate that respondents mainly view AI as a tool for improving operational efficiency, while also recognizing its potential to support innovation,
better decisions, and cost savings in green start-ups.

12. What is the major challenge faced by green start ups when adopting AI?

Options	Percentage
High cost	26.8%
Lack of skilled employees	45.1%
Privacy concerns	19.5%
Lack of technical infrastructure	8.5%

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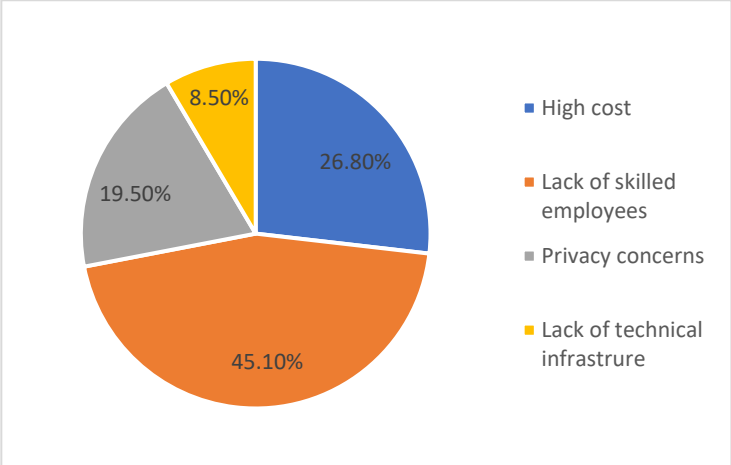
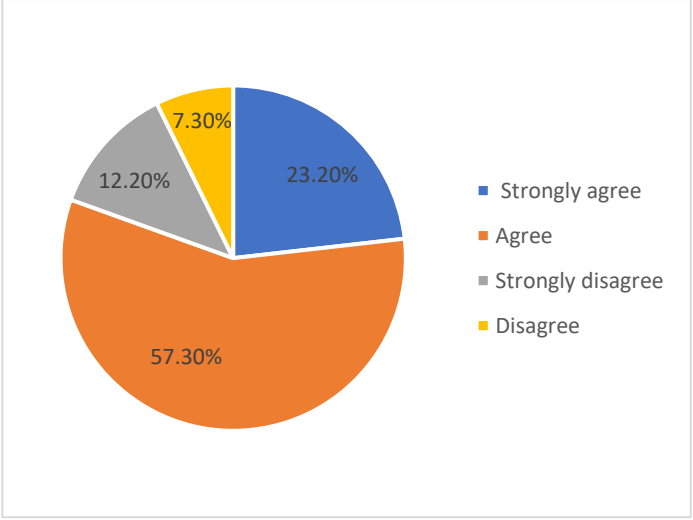


Interpretation: The chart shows that lack of skilled employees is the major challenge faced by green start-ups when adopting AI, as reported by 45.1% of respondents. High cost is the second major challenge, with 26.8% of respondents selecting it. Privacy concerns account for 19.5%, while lack of technical infrastructure is identified by 8.5%. Overall, the findings indicate that green start-ups mainly face challenges related to skilled manpower and the cost of adopting AI, highlighting the need for employee training, affordable AI solutions, and better technical support.

13. Do you think the benefits of adopting AI outweigh its costs for green start ups ?

Options	Percentage
Strongly agree	23.2%
Agree	57.3%
Strongly disagree	12.2%
Disagree	7.3%



Interpretation: The chart shows that most respondents believe the benefits of adopting AI outweigh its costs for green start-ups. About 57.3% agree and 23.2%

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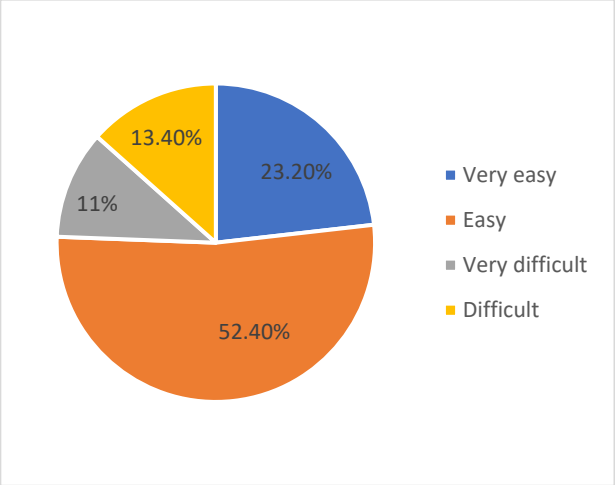
strongly agree, giving a combined positive response of 80.5%. In contrast, 7.3% disagree and 12.2% strongly disagree. Overall, the findings indicate that a large majority of respondents view AI adoption positively, suggesting that the potential benefits such as improved efficiency, innovation, sustainability, and better decision-making are perceived to be greater than the costs involved.

14. How easy it is for green start ups to access the technology and resources required for AI adoption?

Options	Percentage
Very easy	23.2%
Easy	52.4%
Very difficult	11%
Difficult	13.4%



Interpretation: The chart shows that most respondents find it easy for green start-ups to access the technology and resources required for AI adoption. About 52.4% of respondents consider it easy, while 23.2% consider it very easy. Thus, 75.6% have a positive view of the accessibility of AI technology and resources. On the other hand, 13.4% find it difficult and 11% find it very difficult. Overall, the findings indicate that AI technology is generally accessible to green start-ups, although some businesses may still face challenges in obtaining the required resources and infrastructure.

15. Would you recommend AI adoption to other green start ups for sustainable business development?

Options	Percentage
Probably yes	46.3%
Definitely yes	43.9%
Definitely no	7.3%
Probably no	2.4%

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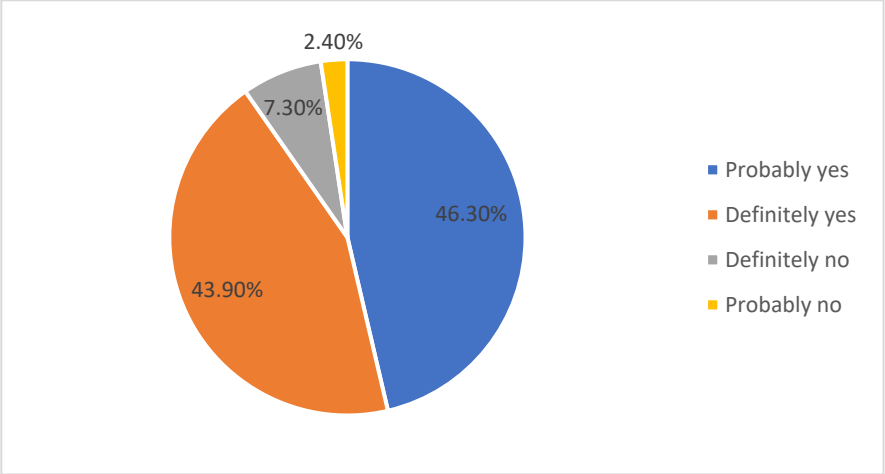

Interpretation: The chart shows that most respondents would recommend AI adoption to other green start-ups for sustainable business development. About 46.3% of respondents said probably yes, while 43.9% said definitely yes. Together, 90.2% of respondents gave a positive response. In contrast, 7.3% said definitely no and only 2.4% said probably no. Overall, the findings indicate that AI adoption is widely supported and is perceived as a valuable tool for promoting sustainable growth and development among green start-ups.

Conclusion:

The study titled "Small Biz Basics: A Study on Teaching Financial Literacy to Aspiring Local Artists "concludes that financial literacy is an important skill for artists who want to turn their creative talents into sustainable careers or small businesses. Many aspiring local artists have strong creative abilities but may have limited knowledge of budgeting, saving, pricing, managing expenses, maintaining financial records, taxation, and digital payment methods.

The study highlights that basic financial knowledge can help artists make better financial decisions, manage irregular income, avoid unnecessary financial difficulties, and plan for their future. Understanding concepts such as budgeting, cash-flow management, pricing of artwork, savings, expenses, and basic taxation can enable artists to manage their creative activities more professionally. The study ultimately demonstrates that combining artistic creativity with financial literacy can help local artists convert their passion into sustainable and successful small businesses while contributing to their personal and economic development.

Teaching financial literacy through simple, practical, and easy-to-understand methods can therefore improve the confidence and financial independence of aspiring artists. Workshops, awareness programmes, demonstrations, and practical examples can make financial concepts more accessible to the artistic community.

Overall, the study concludes that financial literacy and artistic skills should go hand in hand. By developing both creative and financial skills, local artists can improve

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their business practices, increase their earning potential, and build more sustainable careers. Financial education can ultimately empower aspiring artists to transform their passion into a financially stable and successful small business.

Another important finding is that financial concepts should be taught in a simple, practical, and artist-friendly manner. Instead of using complicated financial terminology, training can focus on real-life examples related to artists, such as calculating the cost of materials for a painting, deciding the selling price of artwork, maintaining a daily income-and-expense record, understanding commission charges, and separating personal and business finances. Such practical learning can make financial education more meaningful and easier to apply.

The study also highlights the importance of digital financial awareness among aspiring artists. Knowledge of digital payments, online banking, digital record keeping, and basic online business practices can help artists receive payments securely and manage their financial activities more efficiently. Awareness of taxation and basic legal and financial responsibilities can further encourage artists to operate their businesses in a more organized and professional manner.

Financial literacy can also contribute to better decision-making and confidence. Artists who understand their financial position are more likely to negotiate prices appropriately, evaluate business opportunities, control unnecessary expenses, and plan investments. This can reduce financial uncertainty and allow them to concentrate more effectively on their creative careers.

References:

1. ***Barlet, C., &Roser, A. M. (2024).****Artificial intelligence and sustainable business innovation: Applications in finance and marketing.*

   Main area: *Artificial Intelligence, sustainable innovation, finance, marketing, and digital transformation.*

   Relevance to your study: *This study supports your research by explaining how AI can help businesses improve sustainable practices and create long-term value*

2. ***Khaddam, A. A. (2025).****Artificial intelligence and business intelligence for energy management and ESG performance.*

   Main area: *AI, Business Intelligence, energy management, ESG reporting, and carbon reduction.*

   Relevance to your study: *It is useful for explaining how AI can help green businesses monitor energy consumption, predict demand, automate ESG reporting, and improve environmental performance.*

3. ***Rajbul, M. (2024).****Sustainable entrepreneurship in the digital age: The role of AI in green business practices.*

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Main area: *AI, sustainable entrepreneurship, green business, and SDGs.*
Relevance to your study: *This reference directly supports your topic because it connects AI adoption with sustainable entrepreneurship. It explains how AI can optimize resources, reduce environmental impact, and support environmentally responsible business development.*

4. ***Sharma, V. (2021).****Household energy use and cooking preferences in rural India.*
Main area: *Sustainable energy use, clean energy adoption, rural households, and environmental sustainability.*
Relevance to your study: *Although this study focuses on households rather than startups, it provides useful evidence about factors influencing sustainable energy adoption, including income, education, employment, access, and awareness.*
5. ***Younus, H. (2025).****The role of artificial intelligence and ESG integration in sustainable development and corporate governance.*
Main area: *AI, ESG, corporate governance, environmental monitoring, and ethical decision-making.*
Relevance to your study: *This is highly relevant to your research because it links AI adoption with ESG performance. It demonstrates how AI can improve environmental monitoring, stakeholder engagement, governance, and responsible decision-making.*
6. ***Zhang, X. (2025).***Artificial intelligence and corporate sustainable development: Resource efficiency, carbon reduction and ESG.
Main area: *AI, resource efficiency, carbon emissions, supply chains, product lifecycle, and ESG.*
Relevance to your study: *The study supports the argument that AI can help businesses achieve ESG objectives through energy optimization, carbon tracking, sustainable supply-chain management, and product lifecycle management.*

APPENDIX:

1. **To what extent do you think AI helps business to reduce their environmental impact ?**
   - To some extent
   - To little extent
   - To a great extent
   - Not at all
2. **How effective is AI helping entrepreneurs identify sustainable business opportunities?**
   - Very effective
   - Effective
   - Slightly effective
   - Not effective

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3. Does AI help entrepreneurs reduce wastage of resources such as energy, materials ,and time?

- Strongly agree
- Agree
- Disagree
- Strongly disagree

4. How important is AI for developing eco-friendly products and services?

- Very important
- Important
- Less important
- Not important

5. Do you believe AI can improve the long term sustainability and profitability of start ups?

- Strongly agree
- Agree
- Strongly disagree
- Disagree

6. To what extent does AI help business monitor and reduce their environmental impact?

- To a great extent
- To some extent
- To little extent
- Not at all

7. Does AI improve transparency and accuracy in ESG reporting?

- Strongly agree
- Agree
- Strongly disagree
- Disagree

8. How effectively can AI help companies identify social and work place related risks?

- Very effective
- Effective
- Slightly effective
- Not effective

9. Does AI support better corporate governance and decision making?

- Strongly agree
- Agree
- Strongly disagree
- Disagree

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10. How important is AI in helping business achieve their ESG goals?

- Very important
- Important
- Less important
- Not important

11. What is the biggest opportunity AI provides to green start ups?

- Cost reduction
- Improved efficiency
- New product development
- Better decision making

12. What is the major challenge faced by green start ups when adopting AI?

- High cost
- Lack of skilled employees
- Privacy concerns
- Lack of technical infrastructure

13. Do you think the benefits of adopting AI outweigh its costs for green start ups ?

- Strongly agree
- Agree
- Strongly disagree
- Disagree

14. How easy it is for green start ups to access the technology and resources required for AI adoption?

- Very easy
- Easy
- Very difficult
- Difficult

15. Would you recommend AI adoption to other green start ups for sustainable business development?

- Probably yes
- Definitely no
- Probably no
- Definitely no

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BEYOND GREEN CLAIMS: PERCEIVED ESG AUTHENTICITY, GREENWASHING AND THEIR IMPACT ON CONSUMER TRUST AND PURCHASE DECISIONS

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Akshita Poojari
Ghanshyamdas Saraf College of Arts & Commerce

Abstract:
This study examines the impact of perceived ESG authenticity and greenwashing on consumer trust and the effect of trust on purchase decisions, using Signaling Theory. Primary data was collected from 200 consumers through a structured questionnaire and analysed using simple linear regression. The findings show that ESG authenticity significantly influences consumer trust ($\beta = 0.577$, $p < 0.001$), while greenwashing also shows a significant positive relationship with trust ($\beta = 0.572$, $p < 0.001$), contrary to the hypothesised direction. Consumer trust strongly influences purchase decisions ($\beta = 0.704$, $p < 0.001$) and explains 49.6% of the variation. The study highlights the importance of genuine ESG practices, transparent communication and consumer trust in influencing consumer purchase decisions.
Keywords: *ESG, Greenwashing, Consumer Trust, Purchase Decisions, Sustainability, Signaling Theory.*

Introduction:

Sustainability is increasingly influencing consumer choices, making **ESG practices** important for businesses. However, the rise in sustainability claims has also increased concerns about **greenwashing.** According to **PwC's Voice of the Consumer Survey 2024, 60% of Indian consumers** had shifted towards sustainable products and were willing to pay **13.1% more** for sustainably produced or sourced products. Similarly, **Deloitte's 2024 Gen Z and Millennial Survey** reported that **81% of Indian Gen Z** and **84% of Indian millennials** were willing to pay more for environmentally sustainable products or services. However, the **European Commission** found that **53% of green claims** were vague, misleading or unfounded, while **40% lacked supporting evidence.** In India, the **Department of Consumer Affairs introduced Greenwashing Guidelines in 2024** to address misleading environmental claims. Therefore, this study examines whether **ESG authenticity builds consumer trust**, while **greenwashing reduces trust and affects purchase decisions.**

Signaling Theory: Signaling Theory (Spence, 1973) explains how companies communicate information through signals. Here, ESG communication acts as a signal of a company's sustainability commitment. Genuine ESG practices may build trust,

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while greenwashing may reduce trust and negatively affect purchase decisions. Thus, the theory explains the link between ESG authenticity, greenwashing, consumer trust and purchase decisions.

Research Flow:

ESG Communication → ESG Authenticity / Greenwashing → Consumer Trust → Purchase Decision.

Review of Literature:

1. ESG Communication and Perceived ESG Authenticity

Lee (2025), "The Impact of ESG Management on Consumer Trust and Purchase Intention," found that effective ESG practices can strengthen consumer trust and purchase intention. When ESG communication is genuine, transparent and consistent with actual practices, consumers are more likely to view the company positively and develop greater trust.

2. Greenwashing and Consumer Skepticism

Delmas and Burbano (2011), "The Drivers of Greenwashing," highlighted how misleading environmental claims can reduce stakeholder confidence. Chen and Chang (2013), "Greenwash and Green Trust," found that greenwashing negatively affects consumer trust. Similarly, Nyilasy et al. (2014), "Perceived Greenwashing," showed that unsupported environmental claims can create negative consumer reactions and skepticism.

3. Consumer Trust and ESG Perceptions

Chen and Chang (2013) found that misleading sustainability claims can reduce consumer trust, while credible communication can strengthen confidence. Thus, consumer trust acts as an important link between how consumers perceive ESG claims and their subsequent responses to the company.

4. Consumer Trust and Purchase Decisions

Lee (2025) demonstrated a relationship between ESG practices, consumer trust and purchase intention. Consumers who trust a company's ESG commitments are more likely to develop favourable attitudes and consider purchasing its products or services. Therefore, trust can play an important role in converting ESG perceptions into purchase decisions.

Research Gap: Existing studies often examine ESG authenticity, greenwashing, consumer trust and purchase decisions separately. Limited research connects these factors from the consumer perspective, especially in India. This study fills the gap by using Signaling Theory to examine how genuine and misleading ESG signals influence consumer trust and purchase decisions.

Research Methodology:

1. Research Design: Descriptive and Analytical Research Design

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2. Scope of the Study: The study focuses on consumer perceptions of corporate ESG claims, particularly ESG authenticity and greenwashing, and examines their impact on consumer trust and purchase decisions.

3. Research Objectives:

RO1: To examine the influence of perceived ESG authenticity on consumer trust.

RO2: To assess the influence of perceived greenwashing on consumer trust.

RO3: To examine the influence of consumer trust on consumers' purchase decisions.

4. Hypotheses of the Study:

H_{11}: Perceived ESG authenticity has a significant positive influence on consumer trust.

H_{12}: Perceived greenwashing has a significant negative influence on consumer trust.

H_{13}: Consumer trust has a significant positive influence on consumers' purchase decisions.

5.Sources of Data: Primary data was collected through a structured questionnaire from 200 consumers and secondary data was collected from SEBI, MCA, NSE, BSE, corporate ESG/sustainability reports, academic journals, research papers, books and credible reports.

6. Sample:

Sample Size: 200 respondents

Sampling Technique: Convenience Sampling

Instrument: Structured Questionnaire

Scale: 5-Point Likert Scale

Data Analysis and Interpretation:

1. **Reliability Analysis:** Cronbach's Alpha was used to check the internal consistency of the questionnaire constructs.

Construct	No. of Items	Cronbach's Alpha	Interpretation
Perceived ESG Authenticity	5	0.79	Good reliability
Perceived Greenwashing	5	0.825	Good reliability
Consumer Trust	4	0.825	Good reliability
Purchase Decisions	5	0.789	Good reliability

Interpretation: All four constructs have Cronbach's Alpha values above the commonly accepted threshold of 0.70. Therefore, the measurement scales demonstrate acceptable to good internal consistency, indicating that all the items are sufficiently reliable.

2. Descriptive Statistics

Variable	Mean	Std. Deviation
Perceived ESG Authenticity	3.331	0.838

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Perceived Greenwashing	3.395	0.851
Consumer Trust	3.47	0.983
Purchase Decisions	3.532	0.838

Interpretation: All mean scores are above the neutral value of 3.00. Respondents show moderately positive perceptions of ESG authenticity, consumer trust and purchase decisions, while awareness/perception of greenwashing is also relatively high.

3. Objective-wise Analysis

Objective 1 – To examine the influence of perceived ESG authenticity on consumer trust.

Hypothesis:

H_{01}: Perceived ESG authenticity has no significant influence on consumer trust.

H_{11}: Perceived ESG authenticity has a significant positive influence on consumer trust.

Test Applied: Simple Linear Regression

Independent Variable: Perceived ESG Authenticity

Dependent Variable: Consumer Trust

Pearson r	R^2	Beta (β)	F-value	t-value	p-value
0.577	0.333	0.577	99.058	9.953	< 0.001

Interpretation: Perceived ESG authenticity has a significant positive influence on consumer trust. The R^2 of 0.333 indicates that ESG authenticity explains approximately 33.3% of the variation in consumer trust.

Decision: Since $p < 0.05$, H_{01} is rejected and H_{11} is supported.

Conclusion: Consumers tend to have greater trust in companies whose ESG claims are perceived as genuine, transparent and credible.

Objective 2 – To assess the influence of perceived greenwashing on consumer trust.

Hypothesis

H_{02}: Perceived greenwashing has no significant influence on consumer trust.

H_{12}: Perceived greenwashing has a significant negative influence on consumer trust.

Test Applied: Simple Linear Regression

Independent Variable: Perceived Greenwashing

Dependent Variable: Consumer Trust

Pearson r	R^2	Beta (β)	F-value	t-value	p-value
0.572	0.327	0.572	96.197	9.808	< 0.001

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Interpretation: Perceived greenwashing has a statistically significant influence on consumer trust. However, the observed coefficient is positive (β = 0.572), whereas the hypothesis predicted a negative relationship.

The model explains approximately 32.7% of the variation in consumer trust.

Decision: Since $p < 0.05$, H_{02} is rejected. However, because the observed relationship is positive rather than negative, the directional hypothesis H_{12} is not supported.

Conclusion: Perceived greenwashing has a significant influence on consumer trust, but the direction of influence observed in the present sample is positive rather than negative.

Objective 3 – To examine the influence of consumer trust on consumers' purchase decisions.

Hypothesis:

H_{03}: Consumer trust has no significant influence on consumers' purchase decisions.

H_{13}: Consumer trust has a significant positive influence on consumers' purchase decisions.

Test Applied: Simple Linear Regression

Independent Variable: Consumer Trust

Dependent Variable: Purchase Decisions

Pearson r	R^2	Beta (β)	F-value	t-value	p-value
0.704	0.496	0.704	194.64	13.951	< 0.001

Interpretation: Consumer trust has a strong and significant positive influence on purchase decisions. The R^2 value of 0.496 indicates that consumer trust explains approximately 49.6% of the variation in purchase decisions.

Decision: Since $p < 0.05$, H_{03} is rejected and H_{13} is supported.

Conclusion: Higher consumer trust is associated with more favourable purchase decisions.

Findings of the Study:

1. ESG authenticity positively influences consumer trust, as genuine, transparent and credible ESG practices increase consumer confidence.
2. ESG authenticity has a significant relationship with consumer trust (β = 0.577, $p < 0.001$); hence, H_{11} is supported.
3. Greenwashing has a significant relationship with consumer trust (β = 0.572, $p < 0.001$), but the relationship is positive rather than the hypothesised negative direction; hence, H_{12} is not supported.
4. The unexpected positive relationship may suggest that consumers who are more aware of greenwashing are also more engaged with ESG information.
5. Consumer trust strongly influences purchase decisions (β = 0.704, $p < 0.001$); hence, H_{13} is supported.

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6. Consumer trust explains 49.6% (R^2 = 0.496) of the variation in purchase decisions, indicating a strong relationship.
7. ESG authenticity explains 33.3% (R^2 = 0.333) of the variation in consumer trust.
8. Greenwashing explains 32.7% (R^2 = 0.327) of the variation in consumer trust.
9. Overall, the findings show that ESG perceptions influence consumer trust, and trust plays an important role in purchase decisions.

Suggestions and Recommendations:

A. For Businesses:

1. Ensure genuine and transparent ESG practices.
2. Avoid exaggerated or unsupported sustainability claims.
3. Use credible certifications and evidence to strengthen ESG communication.

B. For Consumers

1. Improve awareness about ESG and greenwashing.
2. Check the credibility and evidence behind sustainability claims.
3. Consider reliable certifications before making purchase decisions.

C. For Regulators

1. Strengthen monitoring of greenwashing and misleading ESG claims.
2. Promote clear guidelines for sustainability communication.
3. Take appropriate action against false or unsupported claims.

Conclusion:

The study concludes that genuine ESG practices can build consumer trust, while perceptions of greenwashing also significantly influence trust. Consumer trust has a strong positive impact on purchase decisions ($\beta = 0.704$, $p < 0.001$). Therefore, businesses should focus on authentic ESG practices, transparent communication and avoiding misleading claims to build trust and encourage positive consumer responses.

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(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
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ETHICAL LEADERSHIP AND LEADER EFFECTIVENESS: AN EMPIRICAL STUDY BASED ON SUBORDINATES' PERCEPTIONS

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Introduction:

In today's world where the corruption and unethical work have taken a rise and the need of the hour is to have a basic ranking system where a leader's ethicality can be tested and can be assessed and made available in public domain. The ethical questionnaire can be asked from the leaders directly as they are bound to be biased towards answering in a manner which will showcase their character as an ethical individual. So, the new approach should be to ask the questions from the subordinates and maintain confidentiality. Rather than relying on leaders' self-assessment, the present study proposes to assess ethical leadership from the perspective of subordinates and employees who directly experience the leader's behaviour in the workplace. The best approach would be to ask questions to those who are about to leave the institutions and this way they can be neutral in their approach and without the fear of any actions from their leaders. In institutions, corporate and government bodies the fear of the actions from the higher ups can lead to a biased answering. Thus, my approach is to introduce a questionnaire that we can ask to the individuals who are about to leave the institutions and that we can get a certain unbiased data from the individuals.

The problems of unethical leadership are that there is no individual test at the institutional level, and neither is there any accountability set with these ranking. The problems of corruption and transparency and accountability can be set using a good questionnaire and a good ethical leadership evaluation method. A leader needs to be ethical to resolve the issue of inefficiency, stagnant growth of capable subordinates and exploitation by leaders. Ethical leadership has emerged as an important area of research in the field of organisational behaviour and management, particularly because leadership practices have a direct influence on employees and organisational outcomes. In a workplace, effective leadership is not only concerned with achieving targets and improving productivity but also with ensuring fairness, integrity, accountability and responsible decision-making. Ethical leaders are expected to demonstrate appropriate behaviour, treat employees fairly, communicate ethical standards and consider the interests of different stakeholders while making decisions.

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Review of Literature:

1. Impact of Ethical Leadership on Organizational Performance and Employee Engagement: A Comprehensive Review
   Rachna Paliwal and J. Nagda
   The meta-review integrates the evidence from varied organizational settings, and it is concluded that ethical leadership is always associated with greater employee engagement, organizational citizenship behaviour, and performance outcomes over the long run. However, the mechanisms through which the latter are generated are highly complex and situation-specific.
2. Actions speak louder than words: The benefits of ethical behaviors of leaders.
   Carmen Tanner, Adrian Brügger, and 2 more
   Ethical scandals in business have led to calls for more ethical or moral leadership. Yet, we still know very little about what characterizes ethical leadership and what its positive consequences actually are. We argue that the major question is not about what leaders value, but rather whether their ethical values are regularly reflected in behavioral patterns across situations and situational challenges. To address this, we have begun to build the Ethical Leadership Behavior Scale, which is based on behaviors reflecting concrete manifestations of ethical values (e.g., fairness, respect) across occasions and situational barriers.
3. A Meta-Analytic Test of the Outcomes and Correlates of Ethical Leadership
   E. Theys, William Scanu, and 1 more
   This meta-analytic review examined the outcomes and correlates of ethical leadership. Results indicated that ethical leadership is related to important employee attitudinal and behavioral outcomes. Ethical leadership was positively related to follower performance (.23) as well as citizenship behavior (.34), and negatively related to counterproductive work behavior (-.29). Further, ethical leadership positively influenced follower job satisfaction (.49) and organizational commitment (.42). Although these results are promising, we found significant overlap between ethical leadership and two leadership constructs: transformational leadership and LMX. As a result, we suggest a provocative agenda for future research.
4. Meta-Analysis Study on Organizational Outcomes of Ethical Leadership
   Huseyin Akar
   The aim of this study is to synthesize the results of the studies examining the relationship between ethical leadership and organizational justice, organizational commitment, organizational trust, organizational cynicism, motivation, job satisfaction and mobbing in educational organizations. The findings are as follows; the effect size of ethical leadership on organizational trust [r =.82] is "very strong"; effect size of ethical leadership on job satisfaction [r =.63], organizational

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justice [r =.76] and organizational cynicism [r= -.56] is "strong"; effect size of ethical leadership on organizational commitment [r=.44] and motivation [r =.47] is "moderate"; effect size of ethical leadership on mobbing [r= -.28] is "modest". According to the results, while the ethical leadership behaviors in educational organizations increase, organizational justice, organizational trust, organizational commitment and job satisfaction of education employees increase; whereas organizational cynicism behaviors and mobbing perceptions decrease.

5. Nurses' ethical leadership and related outcome variables: Systematic Review and Meta-analysis.
   Sunmi Kim, S. Jeong, and 1 more
   To investigate the outcomes and the effect sizes of ethical leadership in nursing practice. Many meta-analysis of ethical leadership have conducted in other fields, but there are none of the effects of ethical leadership of nurse leaders and should be investigated. This study confirmed the positive effects of ethical nursing leadership on individual nurses' perceptions about their leaders, their jobs, and organizations

Objectives:

1. To examine how ethical leadership has been associated with leader effectiveness and workplace performance in previous empirical studies.
2. To propose a suitable questionnaire framework for measuring perceived ethical leadership and leader effectiveness from the perspective of subordinates for future empirical research.

Research Methodology:

1. **Research Design:** The study will adopt a descriptive, literature-based and conceptual research design. The study does not involve primary data collection from leaders or employees. Instead, it systematically reviews existing research on ethical leadership, its dimensions, measurement instruments, leader effectiveness and workplace performance.
2. **Nature of the Study:** Qualitative, literature based and methodological in nature and with a conceptual framework development component which is visible in the questionnaire recommended.
3. **Sources of Data:** Secondary data collected from the following sources:
   a. Peer-reviewed research papers
   b. Ethical leadership measurement studies
   c. Published ethical leadership questionnaires
   d. Studies examining leader effectiveness

4. Limitations of the study:

a. Absence of Primary Data Collection

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b. No Empirical Validation of the Proposed Questionnaire
c. Dependence on Existing Literature

Analysis and Comparatives Evaluation of Existing Questionnaires:

a. Paliwal & Nagda review: The supplied review concludes that ethical leadership is associated with employee engagement, organisational citizenship behaviour and performance outcomes, while noting that the mechanisms are complex and situation specific.
b. Tanner, Brügger et al.: Ethical leadership is framed as observable ethical behaviour rather than merely leaders stated values. Their employee/work-unit study linked ethical-leadership behaviour with job satisfaction, work engagement, affective commitment and work outcomes.
c. Theys, Scanu et al. meta-analysis: Ethical leadership was positively related to follower performance (r=.23) and citizenship behaviour (r=.34), negatively related to counterproductive work behaviour (r=-.29), and positively related to job satisfaction (r=.49) and organisational commitment (r=.42).
d. Akar meta-analysis: In educational organisations, ethical leadership showed very strong association with organisational trust (r=.82), strong associations with job satisfaction (r=.63) and organisational justice (r=.76), and moderate associations with organisational commitment (r=.44) and motivation (r=.47).
e. Rai & Koodamara review: Employees were reported to feel more secure and motivated to share opinions when leaders are ethical; this provides a behavioural mechanism connecting ethical leadership with organisational functioning.
f. Abu Bakar & Connaughton: Their ethical-leadership communication scale focuses on ethics in action, fair treatment and active morality management, and showed additional explanatory value for organisational citizenship behaviour.
g. Yukl et al.: This study explicitly examined ethical leadership in relation to leader–member exchange and work-unit performance and assessed criterion-related validity using leader effectiveness/performance outcomes.
h. Kalshoven et al. ELW: The ELW contains seven ethical-leadership behaviours and, in multi-source evidence, ethical-leadership behaviours explained variance in trust, organisational citizenship behaviour and leader/follower effectiveness beyond a unidimensional measure.
i. Ethical Leadership Behavior Scale validation: A validated 35-item behaviour scale showed positive relationships with work engagement, job satisfaction and affective organisational commitment and a negative relationship with burnout.

Proposed Questionnaire:

Instructions to respondents

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Think about the immediate supervisor,leader you work under most directly. Considering this person's behaviour during approximately the last six months, indicate how strongly you agree with each statement.

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree

The Questions are as follows:

1. My supervisor treats employees fairly when making decisions. Fairness, fairness
2. My supervisor is effective in organising and directing the work of our team. leader effectiveness
3. My supervisor can be trusted to act consistently with what he or she says. integrity
4. My supervisor encourages employees to express their views, concerns and suggestions.
   power sharing; employee voice
5. My supervisor achieves work objectives without compromising ethical standards.
6. Overall, I consider my supervisor to be an effective leader. overall effectiveness
7. My supervisor explains clearly what ethical behaviour is expected from employees.
   ethical guidance
8. My supervisor considers employees' legitimate interests when making important decisions.
   People Orientation
9. My supervisor maintains high standards of work quality in our team. work-unit effectiveness
10. My supervisor sets a personal example of appropriate ethical behaviour at work. ethics in action; Tanner et al.
11. My supervisor gives employees reasonable opportunities to participate in decisions affecting their work.
    Power Sharing
12. My supervisor makes it clear who is responsible for particular tasks and expected results.
    Role Clarification
13. My supervisor deals appropriately with unethical conduct rather than ignoring it. active morality management
14. My supervisor helps the team achieve its objectives efficiently. Leader effectiveness criterion measure
15. My supervisor shows genuine concern for employees' development and well-being.

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People Orientation

16. My supervisor applies rules and standards consistently across employees. fairness; integrity
17. My supervisor communicates openly about ethical issues that arise in our work. ethical leadership communication
18. Compared with similar teams or work units, I consider our team's performance to be strong.

Comparative Work-Unit Performance

19. My supervisor accepts responsibility for decisions rather than shifting blame to employees.
    Synthesized From Ethical-Leadership Literature
20. My supervisor balances achievement of results with concern for how those results are achieved.
21. My supervisor listens to employees before making decisions that directly affect them.
    Power Sharing/People Orientation
22. My supervisor is capable of resolving workplace problems in a timely and appropriate manner.
    Synthesized Criterion
23. My supervisor behaves ethically even when facing difficult or challenging situations.
    Behaviour Across Situations
24. My supervisor makes performance expectations clear to members of the team. role clarification
25. My supervisor encourages employees to raise concerns without fear of unfair treatment.
    fairness
26. My supervisor uses workplace authority responsibly and does not misuse power. power sharing/integrity
27. Overall, my supervisor performs his or her managerial responsibilities effectively. managerial effectiveness
28. My supervisor considers the longer-term consequences of decisions for employees and the organisation.
    sustainability
29. My supervisor recognises and supports behaviour that reflects the organisation's ethical standards.
    active management of morality
30. Our team generally performs better when our supervisor provides clear direction and support.

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Leader/work unit effectiveness

Conclusion:

The present study has examined the major dimensions of ethical leadership and reviewed the principal instruments used for its measurement. The comparison of existing scales indicates that ethical leadership is a multidimensional construct involving behavioural aspects such as fairness, integrity, ethical guidance, people orientation, power sharing and role clarification. The literature further suggests that employees and subordinates can provide valuable assessments because they directly observe the everyday behaviour of their leaders.

Based on this review, the study proposes a 30-item subordinate-based questionnaire combining ethical leadership and leader-effectiveness indicators. The proposed instrument is intended to provide a structured framework for future empirical research examining whether leaders perceived as more ethical are also perceived as more effective and whether such leadership is associated with stronger workplace performance.

However, the proposed questionnaire has not been empirically validated in the present study, and no causal relationship can be established without primary data. Future researchers can administer the proposed instrument to employees working under different leaders and examine its reliability, validity and statistical relationships. Thus, the present study provides a literature-grounded foundation for future empirical investigation of the relationship between ethical leadership and leader effectiveness in the workplace.

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(ISSN – 2581-5830)
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A STUDY ON THE INFLUENCE OF ESG AWARENESS ON CONSUMERS' PURCHASE INTENTION TOWARDS BRANDED CLOTHES IN THE MUMBAI SUBURBAN REGION

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Introduction:

The rapid shift from importance to financial returns to environmental, social and governance (ESG) criteria suggests that businesses are focusing responsibly on how these values are achieved. Professionally managed investment under ESG criteria was expected to surpass USD 41 trillion by 2022 and reach USD 50 trillion by 2025 (Jun, 2024). The ESG Dimension has moved from a particular interest of investors to a conventional perspective through which the officials, personnel and, increasingly, ordinary consumers assess the businesses with which they interact. The ESG is the structure through which this responsibility is assessed, built on three interconnected pillars. The Environmental pillar includes a company's ecological impact, including carbon emissions, water and energy consumption, waste generation, and the utilization of sustainable materials. The Social pillar concerns the treatment of personnel and stakeholder management, encompassing employee welfare, fair wages, labour conditions, and relationships with suppliers and local populace. The Governance pillar focuses on the integrity and accountability of corporate management, including transparency, ethical decision-making, and board oversight. Together, these three frameworks emphasis heavily on organization's sustainability, ethical practices, and the way it creates value addition for its investors. The fashion industry stands out among all other sectors for its high ESG stakes. The global fashion industry, valued at over USD 1.3 trillion and supporting 300 million jobs and becoming one of the most environmentally degrading and labour-exploitative industries (Ellen MacArthur Foundation, as cited in Geneva Environment Network, 2026). The fashion industry has a significant impact on the ESG criteria, as it contributes close to 10% of global carbon emissions than international aviation and shipping together (Earth.Org, 2026). While textile production generates around 20% of global clean water pollution, fueled heavily by textile dyeing and finishing stages (European Parliament, 2025). The sector's labour-reliant production, which has often led to outsourced supply chains, has repeatedly faced criticism regarding worker exploitation and substandard wages. The clothing industry has begun to take necessary actions, as regulators and corporations have begun acting upon it. Major Indian business groups like Aditya Birla Fashion & Retail have introduced specialized

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eco-friendly apparel collections (Expert Market Research, 2026), and ESG disclosures introduced by the European Union under its Corporate Sustainability Reporting Directive push companies to disclose their ESG-related activities. As scrutiny increases, this study explores a central question: Do a brand's ESG practices influence consumer buying choices? A Bain & Company survey discovered that Indian consumers would pay a premium exceeding 20%, despite this willingness, even as a large gap persists between this expressed intent and actual purchase behaviour (Business Standard,2023). According to Simon-Kucher's 2024 Global Sustainability Study, which showcased that over 6,000 consumers were surveyed and found that 54% are willing to pay a premium for sustainable products (Simon-Kucher, 2024). However, this gap between what consumers say and what they actually buy is known as the attitude-behaviour gap.

The following study examines the with a specific focus on ESG awareness rather than general sustainability attitudes within the branded clothing sector. A 2025 study showcases that the sustainability understanding of German consumers has no direct influence on purchase intention of the consumers, which leads that awareness is necessary but falls short for behaviour change (von der Assen & Schellhaas, 2025). After all, awareness and stated willingness do not always translate into behaviour. Mumbai's suburban region serves as an ideal context to evaluate this relationship in this high-volume consumer market. The international clothing brand is considering Mumbai’s suburbs a critical entry point or gateway for expansion. Spanish fast-fashion retailer Bershka opened its first Indian store in Mumbai's Phoenix Palladium mall in February 2025 (IMARC Group, 2025). Under examining Mumbai's suburban consumers, including purchasing power, brand density and retail sophistication, makes it possible to genuinely understand whether ESG awareness shapes purchase intention toward branded clothing apart from the niche “sustainable fashion” segment most existing literature has focused on.

Statement of Problem:

- The clothing industry faces growing pressure for ESG accountability through regulation (EU's CSRD), disclosure mandates, and sustainable product lines like Aditya Birla Fashion & Retail's, yet it remains unclear whether this reaches or influences everyday branded-clothing shoppers, rather than just institutional investors or niche eco-conscious buyers.
- Surveys show high willingness to pay a premium for sustainable products — 54% globally (Simon-Kucher, 2024) and over 20% among Indian consumers (Business Standard, 2023) — but this willingness often fails to convert into actual purchases, as seen in Germany (von der Assen & Schellhaas, 2025) and among urban Indian consumers (Tryphena & Aram, 2023).

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- Most research on this attitude–behaviour gap has studied niche sustainable-fashion buyers or broad national samples, leaving a gap in understanding how ESG awareness functions among mainstream branded-clothing consumers in a dense, high-spending urban market like Mumbai's suburbs.
- Brands and marketers lack region-specific evidence on whether increasing ESG awareness (via labelling, advertising, or disclosure) meaningfully shifts purchase intention, or whether factors like price sensitivity, greenwashing scepticism, or limited availability dominate the purchase decision instead.
- Without this evidence, businesses and policymakers risk investing in ESG communication and disclosure that may not produce the consumer demand shift they assume it will.

Objectives of the Study:

1)To measure the current level of ESG awareness of the residents of suburbs of Mumbai concerning the environmental, social and governance (ESG) practices of the branded clothing brands.

2) To examine the influence of ESG awareness on purchase intention toward branded clothing.

3) To provide region-specific insights into how ESG awareness influences consumers' purchase decisions towards branded clothing, supporting brands and marketers in developing effective ESG communication strategies.

Review of Literature:

Ray and Acharekar (2024) studied youth awareness and attitudes towards green products in Mumbai, examining how CSR influences green purchase intention and behaviour, based on Carlson's CSR model and the Theory of Planned Behaviour. Data from Mumbai respondents aged 18–35 were analysed using SPSS. Findings showed that awareness, attitudes, and social factors significantly influence green purchase intention and behaviour, with economic factors moderating the intention–behaviour link. The study recommended youth-focused awareness initiatives. This is relevant as it confirms that consumer awareness drives environmentally responsible purchasing in Mumbai; however, the present study extends this by focusing specifically on ESG awareness and purchase intention towards branded clothing.

Islam (2025) examined how sustainability practices affect customer engagement in the ready-made garment and fast-fashion industries across Bangladesh, China, Italy, and Mexico. The study found that transparency, authenticity, and clear sustainability communication significantly influence customer engagement, with price, local awareness, trust, and availability shaping consumer responses across countries. It emphasized transparent, credible sustainability practices as key to building trust. This is relevant as it shows sustainability practices shape consumer–brand relationships; however, the present study specifically examines ESG awareness and

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its influence on purchase intention towards branded clothing among Mumbai suburban consumers.

Rastogi et al. (2025) examined how ESG practices influence Generation Z consumers' fashion purchasing decisions, using data from 393 respondents to study links between ESG practices, corporate image, word-of-mouth, trust, and purchase intention. Findings showed ESG practices strengthen corporate image and word-of-mouth, which build trust, and trust strongly predicts purchase intention. The study concluded that credible ESG practices help brands build trust and drive purchasing. This is highly relevant as it links ESG practices to purchase intention in fashion; however, the present study focuses on consumers' own ESG awareness and its influence on branded clothing purchase intention in Mumbai's suburbs.

Khalil and Khalil (2022) examined how social and environmental sustainability awareness influences consumers' impulse buying behaviour, using data from 441 Omani consumers analysed via CFA and SEM. Findings showed sustainability awareness positively influenced green trust, which strengthened impulse buying, while environmental awareness also boosted green altruism and purchasing behaviour. The study highlighted sustainability's role in building trust and driving purchases. This is relevant as it links sustainability awareness to purchasing behaviour; however, the present study specifically focuses on ESG awareness and purchase intention towards branded clothing among Mumbai suburban consumers.

Li and Chen (2025) examined how corporate ESG practices influence Chinese consumers' purchase intention towards green food, with brand trust as a mediator, using SEM on survey data. Findings revealed that all three ESG dimensions positively influence brand trust, which in turn positively affects purchase intention, with trust partially mediating the ESG–intention relationship. The study highlighted ESG's role in building trust and encouraging purchases. This is relevant as it evidences a positive ESG–purchase intention link; however, the present study focuses specifically on branded clothing consumers in the Mumbai suburban region.

Ahmed et al. (2024) examined how ESG factors and behavioural drivers influence Chinese consumers' intentions towards online fashion renting, using SEM on data from 403 respondents. Findings showed attitudes, prior sustainable behaviour, and subjective norms significantly influenced renting intentions, while ESG factors positively shaped consumer attitudes, alongside green self-identity, perceived benefits, psychological risk, and experience value. The study highlighted ESG's role in encouraging sustainable fashion consumption. This is relevant as it shows ESG perceptions shape consumer attitudes and intentions; however, the present study focuses specifically on ESG awareness and purchase intention towards branded clothing among Mumbai suburban consumers.

Research Gap:

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1. **Limited focus on consumer ESG awareness:**
   Most existing studies focus on companies' ESG practices and their influence on consumer behaviour through factors such as brand trust, corporate image and green trust. However, limited research has directly examined whether consumers' own awareness of ESG practices influences their purchase intention.
2. **Limited research on branded clothing:**
   Previous studies have examined ESG and sustainability in areas such as green products, green food, fashion renting and sustainable fashion. There is limited empirical research specifically examining the relationship between ESG awareness and consumer purchase intention in the **branded clothing segment**.
3. **Limited evidence from the Mumbai suburban region:**
   Within the Indian context, existing research has examined green product awareness among specific demographic groups. However, consumers in the broader **Mumbai suburban region**, particularly branded clothing consumers, remain relatively underexplored.
4. **Limited examination of ESG dimensions and purchase intention:**
   There is limited research examining consumer awareness across all three dimensions of ESG—**Environmental, Social and Governance**—and analysing how such awareness is associated with consumers' purchase intention towards branded clothing.

Limitations of the Research:

- The geographical scope is limited to the Mumbai suburban region.
- The sample size is limited to 115 respondents.
- The use of convenience sampling may limit the generalisation of findings.
- The study is based on respondents' self-reported opinions and perceptions.
- Purchase intention may not always translate into actual purchasing behaviour.
- The study focuses specifically on branded clothing and does not cover other fashion or consumer product categories.
- Other factors such as price, brand loyalty, advertising, and product design may also influence consumer purchase decisions but are outside the primary scope of the study.

Research Methodology:

The present study adopts a descriptive and analytical research design to examine the influence of ESG awareness on consumer purchase intention towards branded clothing in the Mumbai suburban region. The study follows a quantitative research approach and is based on both primary and secondary data. Primary data were collected through a structured questionnaire using Google Forms. A total of 100 responses were collected from consumers in the Mumbai suburban region. The study

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uses convenience sampling, as respondents were selected based on their accessibility and willingness to participate in the online survey. The study focuses on ESG awareness as the independent variable, covering Environmental, Social and Governance dimensions, while consumer purchase intention towards branded clothing is considered the dependent variable. The collected data will be classified, tabulated and analysed using appropriate statistical tools such as frequency, percentage analysis, mean and correlation analysis to understand the level of ESG awareness and examine its relationship with consumer purchase intention. The geographical scope of the study is limited to the Mumbai suburban region, and the findings are based on the responses of the selected sample of 100 respondents. The study specifically focuses on branded clothing and examines consumers' stated awareness and purchase intentions.

Data Analysis:

A structured questionnaire has been developed and utilized to collect responses, obtaining a total of 115 participant inputs across various age groups and occupations. The demographic and basic information about respondents is gathered in the table below.

Table 1: Demographic Details

Gender	**Number of Responses**	**Percentage %**
Female	64	55.7
Male	51	44.3
Other	Nil	0
Grand Total	**115**	**100**
Age Group	**Number of Responses**	**Percentage %**
18-24	99	86.1
25-34	7	6.1
35-44	5	4.3
45 and above	4	3.5
Grand Total	115	100
Occupation	**Number of responses**	**Percentage %**
Student	96	83.5
Salaried	16	13.9
Self-employed	3	2.6
Grand Total	115	100

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Monthly spent on branded clothes	Number of respondents	Percentage %
Less than Rs.2,000/-	79	68.7
Between Rs.2,000 – Rs.5,000	27	23.5
Between Rs.5,000/- to Rs.10,000/-	9	7.8
Above Rs. 10,000/-	Nil	Nil
Grand Total	115	100
Purchase of Branded Clothing	**Number of respondents**	**Percentage %**
Yes	91	79.1
No	24	20.9
Grand Total	115	100
Residency Eligibility in Mumbai Suburban Region	**Number of respondents**	**Percentage %**
Yes	105	91.3
No	10	8.7
Grand Total	115	100

Objective 1: To measure the current level of ESG awareness among residents of the Mumbai suburban region concerning the Environmental, Social and Governance (ESG) practices of branded clothing brands.

Figure 1: Awareness of Sustainable or Eco-Friendly Materials Used by Clothing Brands

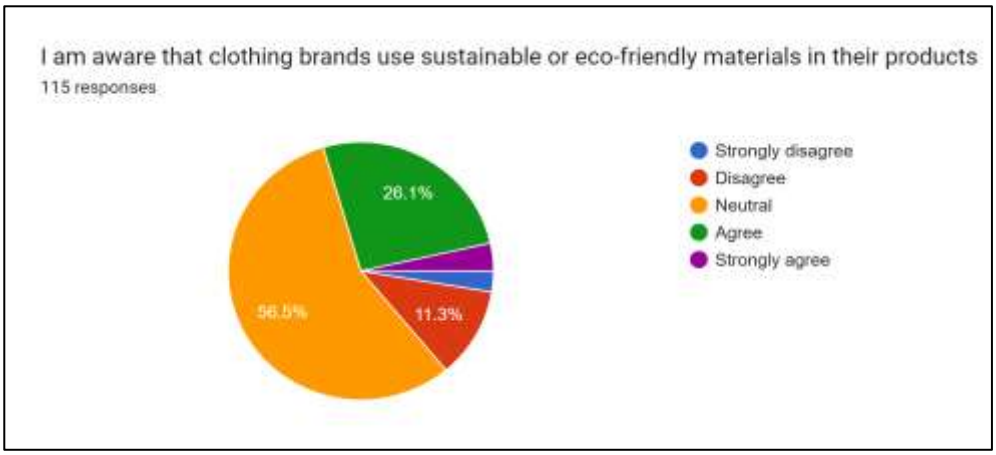

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Figure 1 shows that most respondents (56.5%) remain Neutral about their awareness of sustainable or eco-friendly materials used by clothing brands, while 26.1% Agree and 2.6% Strongly Agree with the statement. A smaller group, 11.3%, Disagree and 3.5% Strongly Disagree. Therefore, the findings indicate that although some consumers are aware of sustainable materials, a significant proportion still has limited or uncertain awareness.

Figure 2: Awareness of Clothing Production's Environmental Impact

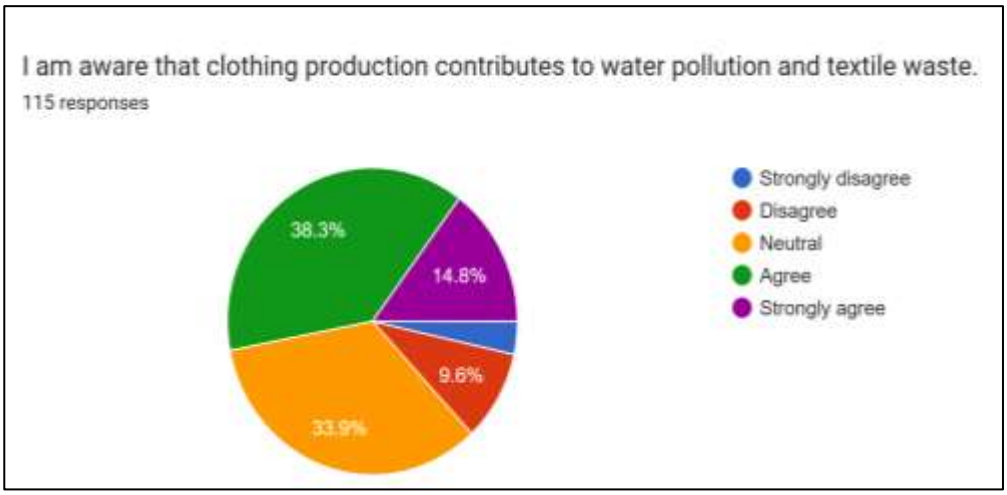

Figure 2 shows that most respondents (53.1%) either Agree (38.3%) or Strongly Agree (14.8%) that clothing production contributes to water pollution and textile waste. Meanwhile, 33.9% remain Neutral, while 9.6% Disagree and a smaller proportion Strongly Disagree. Therefore, the findings indicate that a majority of respondents are aware of the environmental impact of clothing production, particularly its contribution to water pollution and textile waste.

Figure 3: Information-Seeking About Brands' Environmental Practices

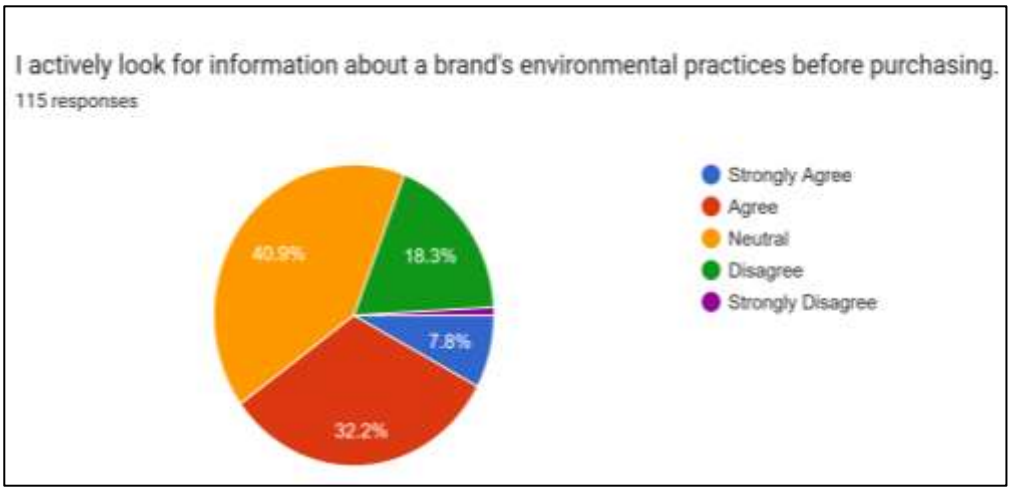

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Figure 3 shows that 40.9% of respondents remain Neutral about actively looking for information on a brand's environmental practices before purchasing. While 32.2% Agree with the statement, only 0.9% Strongly Agree. Meanwhile, 18.3% Disagree and 7.8% Strongly Disagree. Therefore, the findings indicate that although some consumers actively seek environmental information, a considerable proportion do not consistently look for such information before purchasing.

Figure 4: Awareness of Labour Conditions in Clothing Manufacturing

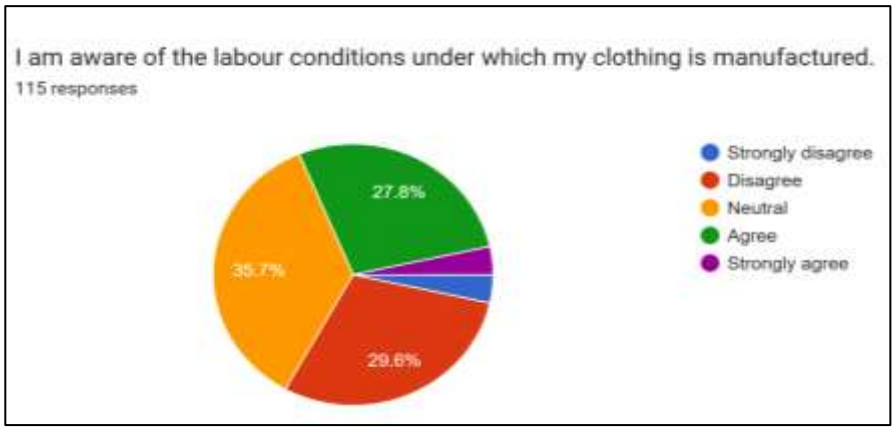

Figure 4 shows that 35.7% of respondents remain Neutral about their awareness of the labour conditions under which their clothing is manufactured. While 27.8% Agree with the statement, 29.6% Disagree. Only a small proportion Strongly Agree or Strongly Disagree. Therefore, the findings indicate that respondents have limited awareness of labour conditions in clothing manufacturing, with a significant number remaining uncertain about this aspect of ESG.

Figure 5: Concern for the Treatment of Factory Workers

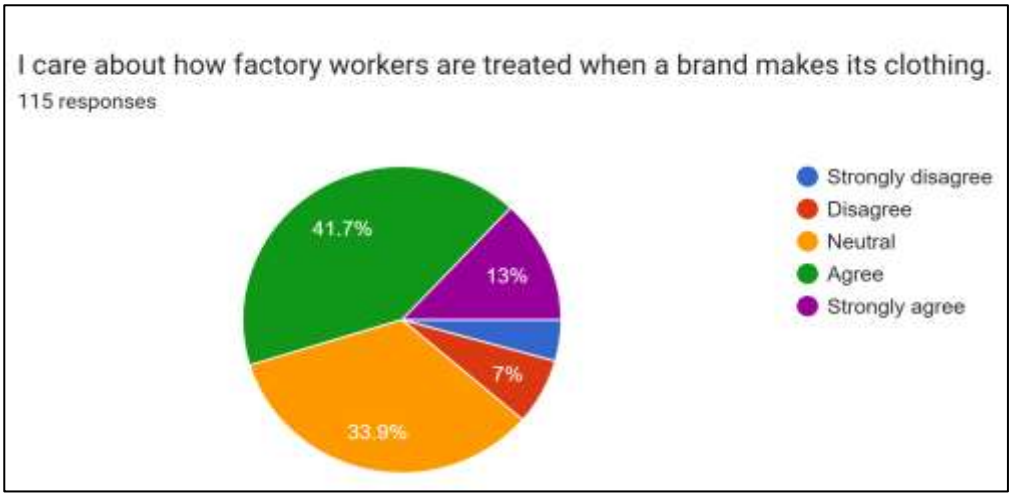

Figure 5 shows that most respondents (54.7%) either Agree (41.7%) or Strongly Agree (13%) that they care about how factory workers are treated when brands

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manufacture clothing. Meanwhile, 33.9% remain Neutral, while a smaller proportion Disagree or Strongly Disagree. Therefore, the findings indicate that respondents generally show concern for the treatment of factory workers, reflecting relatively positive social awareness among consumers.

Figure 6: Awareness of Transparency in Business and Sourcing Practices

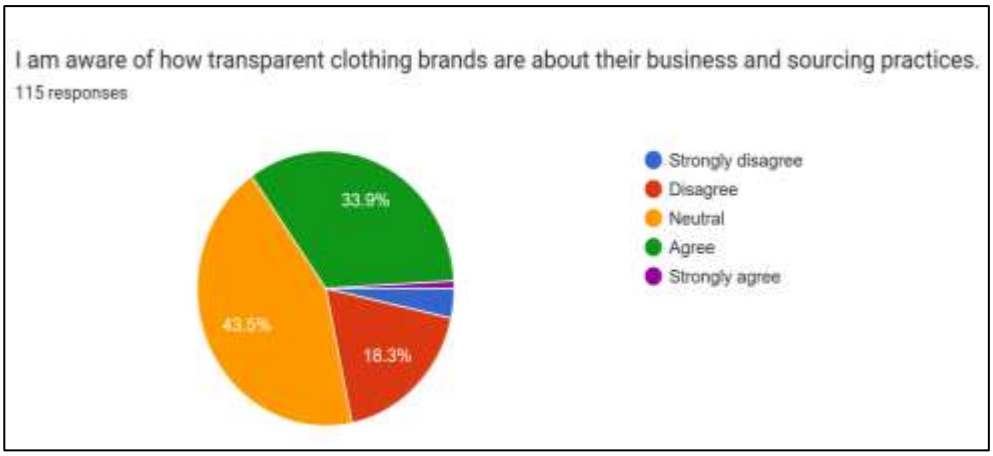

Figure 6 shows that 43.5% of respondents remain Neutral about their awareness of how transparent clothing brands are regarding their business and sourcing practices. While 33.9% Agree with the statement, 18.3% Disagree. Only a small proportion Strongly Agree or Strongly Disagree. Therefore, the findings indicate that awareness of brand transparency is moderate, with many respondents uncertain about the transparency of clothing brands.

Figure 7: Awareness of Sustainability or ESG Reporting by Clothing Brands

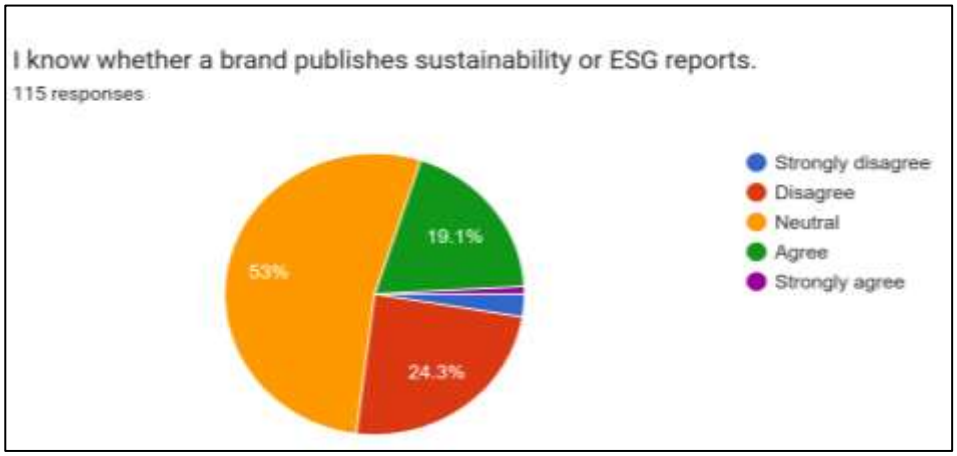

Figure 7 shows that a majority of respondents (53%) remain Neutral about knowing whether clothing brands publish sustainability or ESG reports. While 19.1% Agree with the statement, 24.3% Disagree. Only a small proportion of Strongly Agree or Strongly Disagree. Therefore, the findings indicate that awareness of sustainability

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or ESG reporting among respondents is relatively low, with more than half of the consumers remaining uncertain about such disclosures.

Objective 2: To examine the influence of ESG awareness on purchase intention toward branded clothing.

Figure 8: Purchase Intention Towards ESG-Conscious Brands

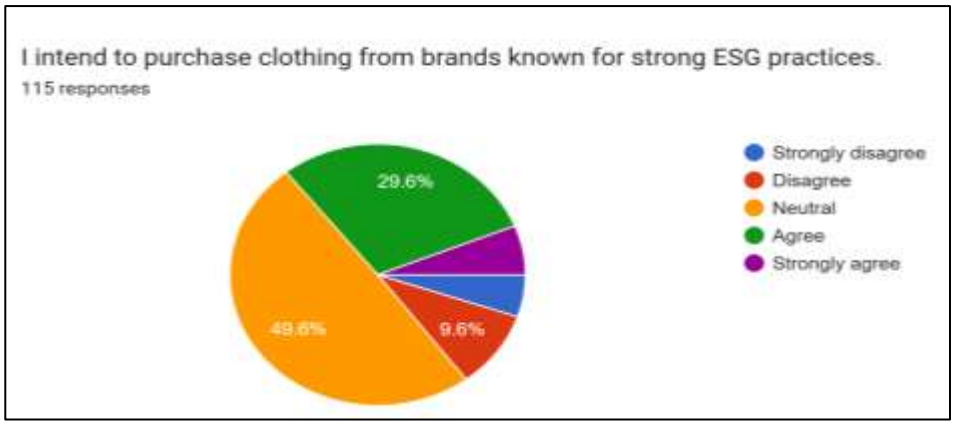

Figure 8 shows that 49.6% of respondents remain Neutral about their intention to purchase clothing from brands known for strong ESG practices. While 29.6% Agree with the statement, a smaller proportion Strongly Agree. Meanwhile, 9.6% Disagree and others Strongly Disagree. Therefore, the findings indicate that although some consumers show positive purchase intention towards ESG-conscious brands, a large proportion remain uncertain about choosing such brands.

Figure 9: Willingness to Pay a Premium for ESG-Conscious Brands

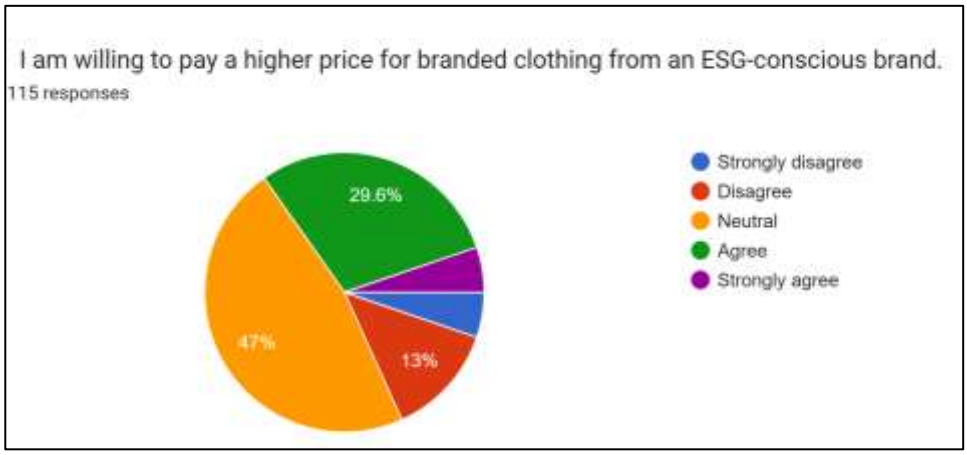

Figure 9 shows that 47% of respondents remain Neutral about their willingness to pay a higher price for branded clothing from an ESG-conscious brand. While 29.6% Agree with the statement, 13% Disagree. A smaller proportion of Strongly Agree or Strongly Disagree. Therefore, the findings indicate that although some consumers are willing to pay a premium for ESG-conscious clothing, a significant proportion remains uncertain about paying a higher price.

Figure 10: Preference for ESG-Conscious Brands

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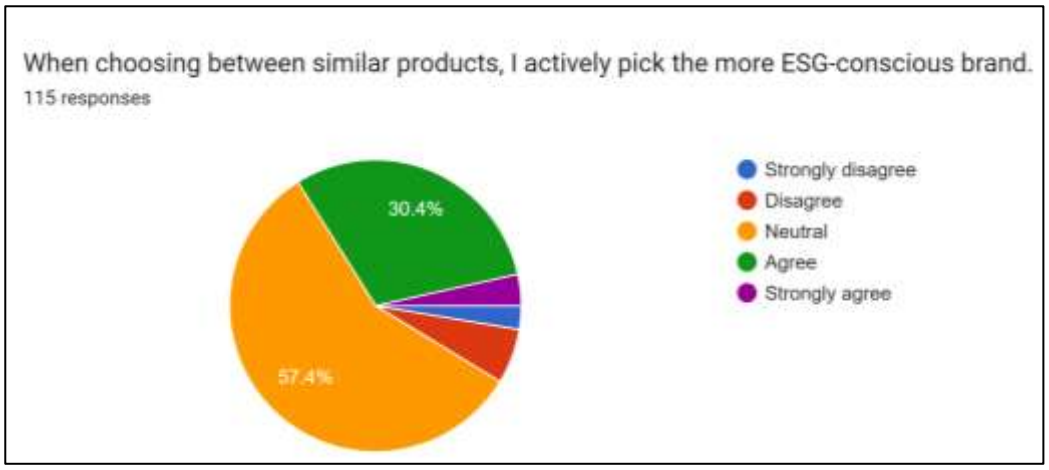

Figure 10 shows that a majority of respondents (57.4%) remain Neutral about actively choosing an ESG-conscious brand when comparing similar products. While 30.4% Agree with the statement, only a small proportion Strongly Agree. The remaining respondents Disagree or Strongly Disagree. Therefore, the findings indicate that ESG considerations do not consistently determine brand preference, with most consumers remaining neutral when choosing between similar branded clothing products.

Objective 3: To provide region-specific insights into how ESG awareness influences consumers' purchase decisions towards branded clothing, supporting brands and marketers in developing effective ESG communication strategies

Figure 11: Price Preference Over ESG Practices

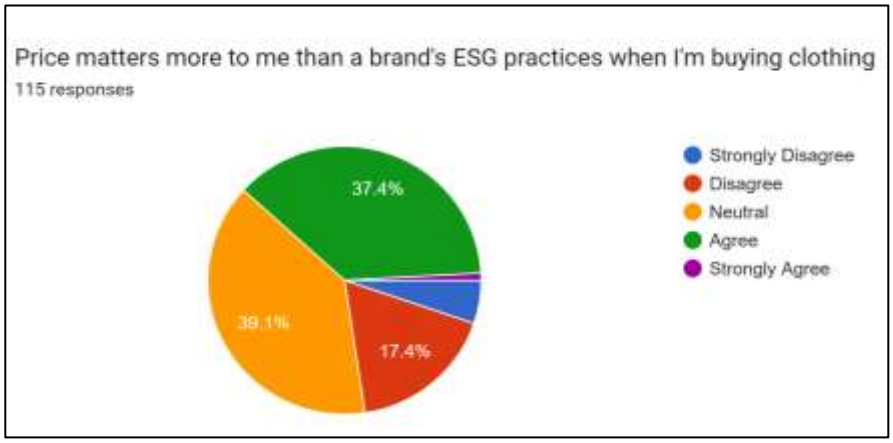

Figure 11 shows that 37.4% of respondents Agree that price matters more than a brand's ESG practices when purchasing clothing, while 39.1% remain Neutral. Meanwhile, 17.4% Disagree with the statement and only a small proportion of Strongly Agree or Strongly Disagree. Therefore, the findings indicate that price remains an important consideration for consumers, which may influence the extent to which ESG practices affect their branded clothing purchase decisions.

Figure 12: Availability of ESG-Conscious Clothing Options

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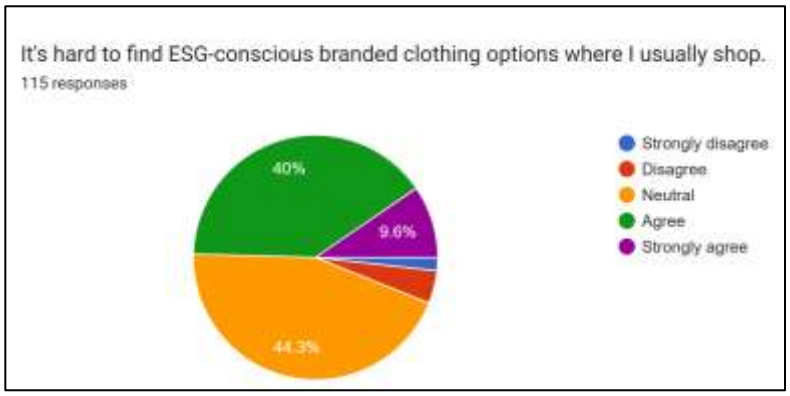

Figure 12 shows that 44.3% of respondents remain Neutral about finding ESG-conscious branded clothing options where they usually shop, while 40% Agree that such options are difficult to find. A smaller proportion of Strongly Agree, while the remaining respondents Disagree or Strongly Disagree. Therefore, the findings indicate that limited availability may be a barrier to purchasing ESG-conscious branded clothing for a considerable number of consumers.

Findings:

- The data analysis was conducted using responses collected through a structured questionnaire from **115 respondents**.
- The majority of respondents were **female (55.7%)**, aged **18–24 years (86.1%)**, and **students (83.5%)**.
- Most respondents reported spending **less than ₹2,000 per month** on branded clothing, indicating relatively moderate spending.
- The findings show that **awareness of sustainable or eco-friendly materials is moderate**, with 56.5% of respondents remaining neutral.
- However, **53.1% of respondents are aware of the environmental impact** of clothing production, particularly water pollution and textile waste.
- Consumers show **limited information-seeking behaviour** regarding the environmental practices of clothing brands before purchasing.
- Awareness of **labour conditions and brand transparency** is also moderate, with many respondents remaining uncertain.
- Respondents show relatively positive **social awareness**, as 54.7% care about the treatment of factory workers.
- Awareness of **sustainability or ESG reporting remains low**, with 53% of respondents remaining neutral.
- Purchase intention towards ESG-conscious brands is **moderate**, as nearly half of the respondents remain neutral.
- **Price continues to be an important factor**, while limited availability of ESG-conscious clothing may also discourage consumers from choosing such products.

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- Overall, the findings suggest that **ESG awareness exists among consumers, but it does not consistently translate into strong purchase intention towards branded clothing**.

Scope of the Study:

The study is limited to examining the influence of ESG awareness on consumer purchase intention towards branded clothing in the Mumbai suburban region. It specifically focuses on the three dimensions of ESG: Environmental practices, such as sustainable materials, pollution reduction and waste management; Social practices, such as fair wages, employee welfare and labour conditions; and Governance practices, such as transparency, ethical decision-making and corporate accountability.

Conclusion:

This study examined the influence of ESG awareness on purchase intention towards branded clothing among 115 consumers in the Mumbai suburban region — predominantly female (55.7%), aged 18–24 (86.1%), and students (83.5%). Findings show ESG awareness is **moderate and inconsistent rather than strong**. Consumers recognized the environmental consequences of clothing production (53.1% aware of pollution/waste) but were far less certain about specific brand practices — 56.5% neutral on sustainable materials use, and limited active information-seeking (40.9% neutral). Social awareness showed a similar gap: strong concern for factory workers (54.7% agreed) but weak actual knowledge of labour conditions (only 27.8% agreed they were aware). Governance awareness was weakest of all — 53% didn't know whether brands publish ESG reports, and 43.5% were unsure about brand transparency. Overall, **consumers care more than they know**, especially on governance. This uncertainty carried into purchase behaviour: intention to buy from ESG-conscious brands (49.6% neutral), willingness to pay a premium (47% neutral), and active brand preference (57.4% neutral) were all lukewarm. ESG awareness **did not consistently translate into purchase intention** — confirming the attitude–behaviour gap already seen in Germany (von der Assen & Schellhaas, 2025) and among urban Indian consumers (Tryphena & Aram, 2023), but this time specifically within ordinary branded-clothing buyers rather than niche "sustainable fashion" consumers — the population prior research had left unexamined. Two concrete barriers explain the gap: price (37.4% said it outweighs ESG practices) and availability (40% found ESG-conscious branded options hard to locate). This suggests brands can't close the gap through awareness campaigns alone — accessible pricing and visible product availability matter just as much. Overall, ESG awareness exists among Mumbai's suburban consumers but is shallow, particularly on governance, and doesn't reliably convert into purchase intention. Given the study's convenience sample skewed toward young students and its reliance

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on self-reported intention, future research could track actual purchasing behaviour or extend this design across a more diverse, multi-region sample.

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A STUDY ON AWARENESS, PERCEPTION AND ADOPTION OF GREEN FINANCE IN PROMOTING SUSTAINABLE DEVELOPMENT

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Aditya Prakash Soni
Ghanshyamdas Saraf College of Arts & Commerce

Abstract:
This study examines the awareness, perception and adoption of green finance and its role in promoting sustainable development. It focuses on understanding individuals knowledge of green financial products and the factors influencing their adoption decisions. The study also identifies barriers such as limited awareness, lack of reliable information and concerns about transparency and greenwashing. Primary data collected through a structured questionnaire is used to analyse respondents views and preferences. The study highlights the importance of financial literacy, transparency and supportive policies in encouraging green finance adoption and achieving sustainable development.

Keywords: *Green Finance, Sustainable Development, ESG, Financial Awareness, Investor Perception, Green Investments, Adoption, Financial Literacy, Transparency, Greenwashing, Sustainable Investment.*

Introduction :

Green finance directs financial resources toward environmentally sustainable and climate-friendly projects. It is closely linked with ESG principles covering environmental, social and governance responsibilities. It supports initiatives such as renewable energy, clean transportation, energy efficiency and sustainable infrastructure. Green Finance encompasses financial instruments such as green bonds, sustainable loans and ESG-focused investments, which channel capital towards environmentally responsible and socially beneficial projects. It plays a vital role in mitigating environmental risks, promoting social well-being and fostering sustainable economic growth while supporting the transition towards a more sustainable future.

Review of Literature :

The literature shows that green finance plays an important role in promoting sustainable development by directing funds toward environmentally friendly projects. Studies highlight its strong connection with ESG principles particularly in improving environmental performance and responsible investment. Ujgaonkar and Dubey (2026) found that ESG awareness among working professionals in Mumbai can influence investment preferences, but awareness alone may not be enough to change

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investment behaviour. The study highlights the importance of understanding ESG factors and examines how awareness varies across demographic and professional groups. Banerjee and David (2024) found that while Indian investors are increasingly aware of ESG factors, returns and risk remain the primary drivers of investment decisions. Key barriers include inconsistent ESG ratings, difficulty in measuring ESG performance and concerns about greenwashing, highlighting the need for better investor education and standardisation.

Green bonds, sustainable loans and ESG investments are widely recognized as important financial instruments. However, challenges such as greenwashing, lack of transparency and inconsistent ESG standards remain. Overall, research suggests that green finance can support sustainable economic growth and improve ESG performance.

Research Objectives :

1. To assess the awareness and understanding of Green Finance among respondents.
2. To examine the familiarity and perceived importance of major Green Finance instruments and their role in investment decision-making.
3. To analyse the perceived contribution of Green Finance to environmental protection, social development and economic development.
4. To identify the major challenges associated with the growth of Green Finance, particularly greenwashing, lack of awareness, standardisation, transparency and high investment costs.
5. To examine the perceived role of greater Green Finance adoption in achieving long term sustainable economic growth.

Research Methodology :

This study adopts a descriptive research design to examine the awareness, perception and adoption of green finance among respondents. The research is based on primary data collected from 55 respondents through a structured questionnaire. The questionnaire includes questions related to awareness of green finance, perception of sustainable investments, ESG practices, preferred green financial instruments and factors influencing adoption. Respondents were selected using a convenience sampling method. The collected data was analysed using basic statistical techniques such as percentages, charts and graphical representation to identify patterns and trends. The findings are used to understand the level of awareness and adoption of green finance and its role in supporting sustainable development.

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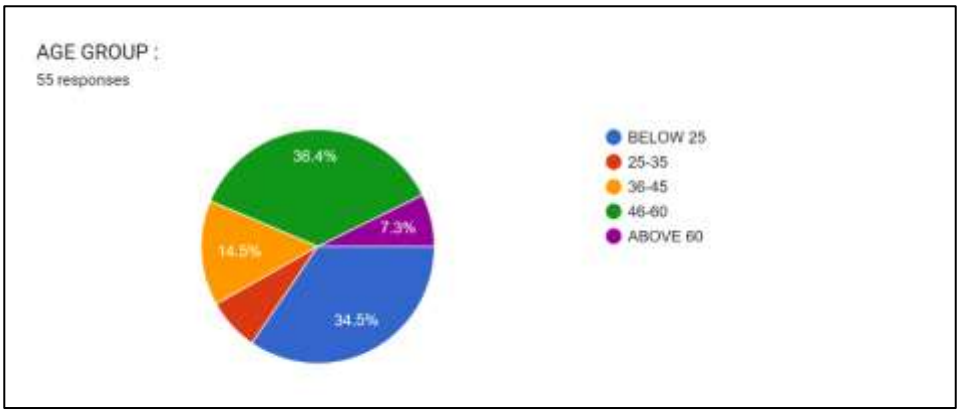

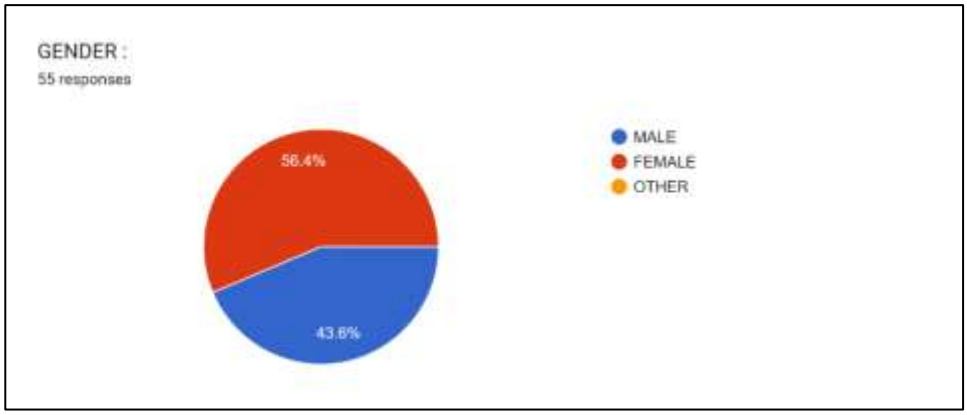

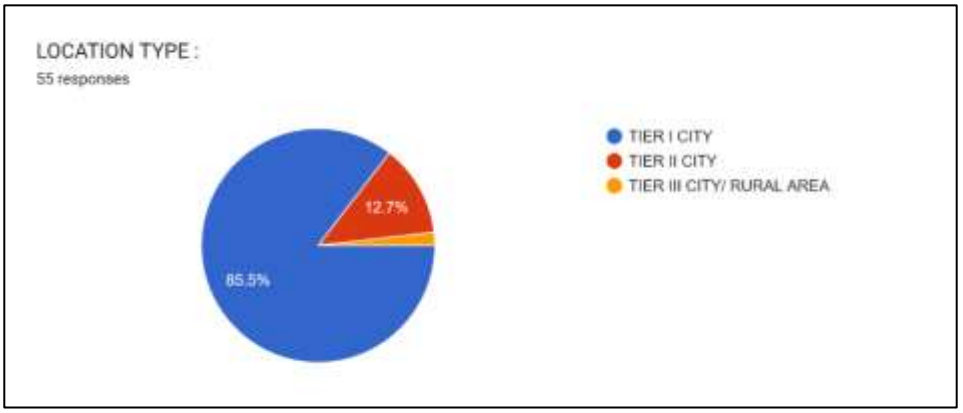

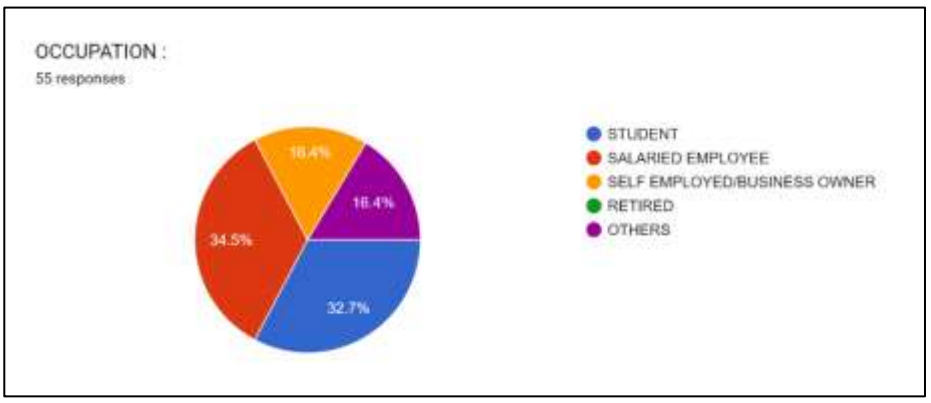

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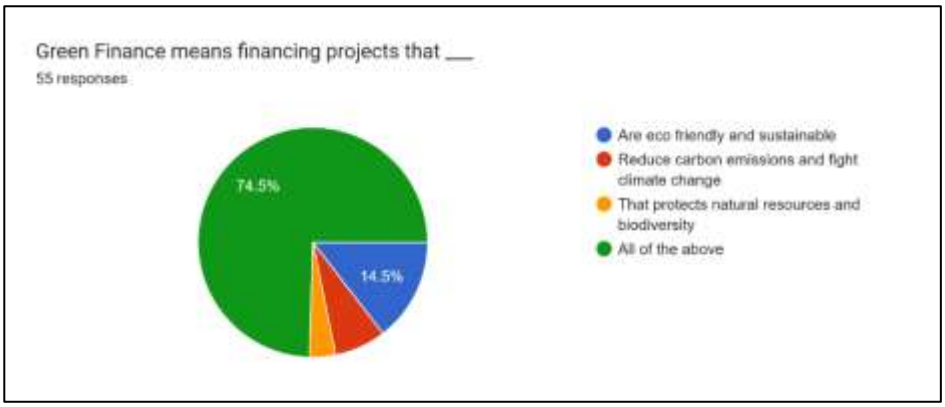

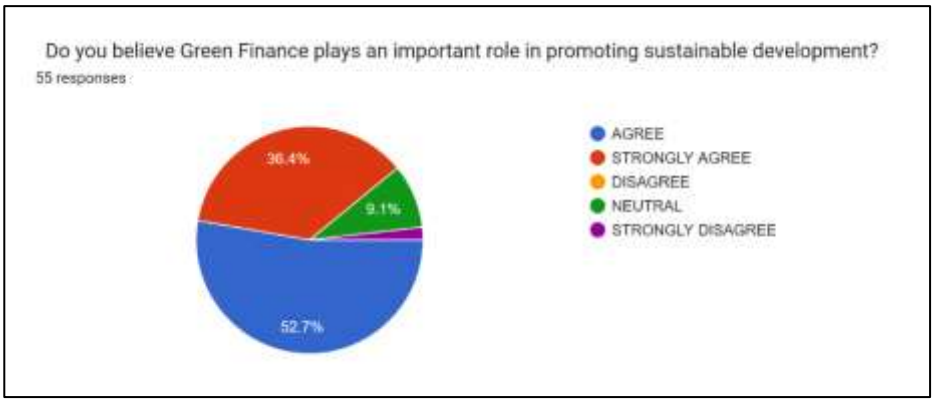

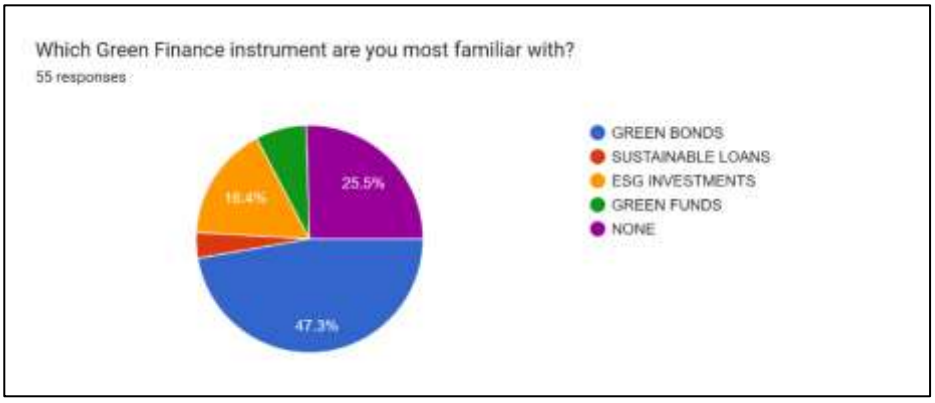

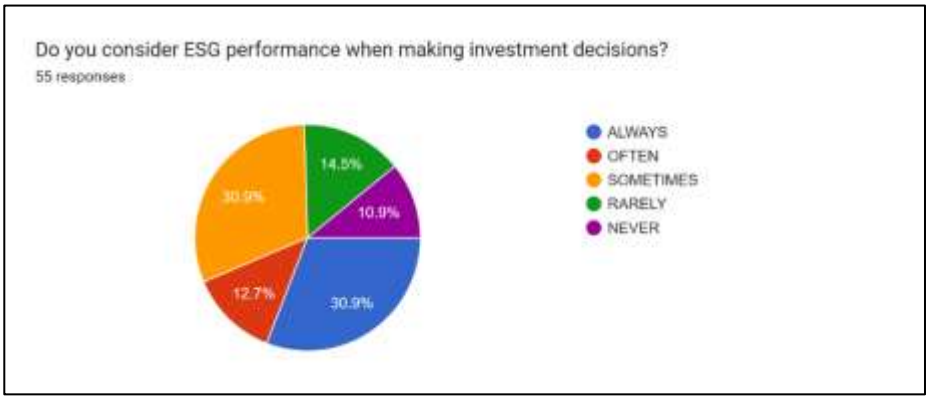

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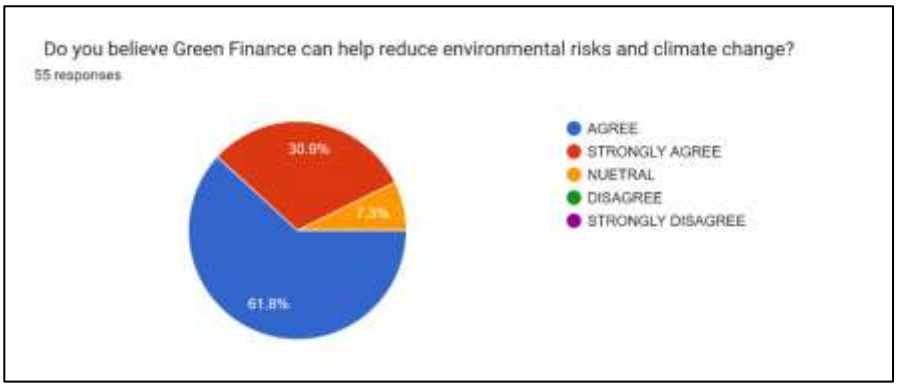

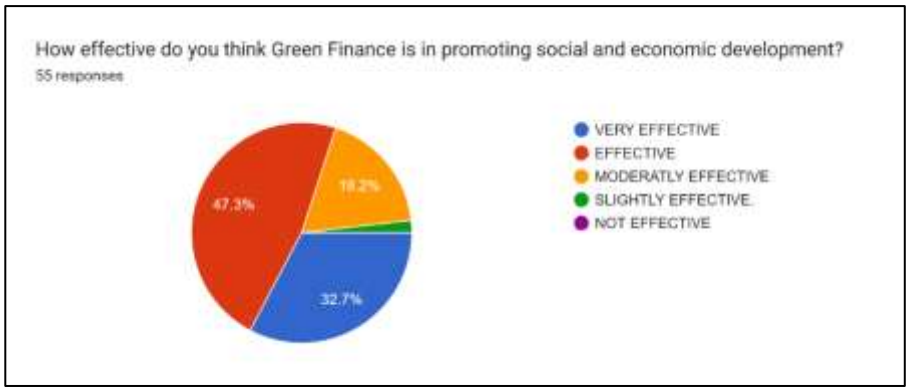

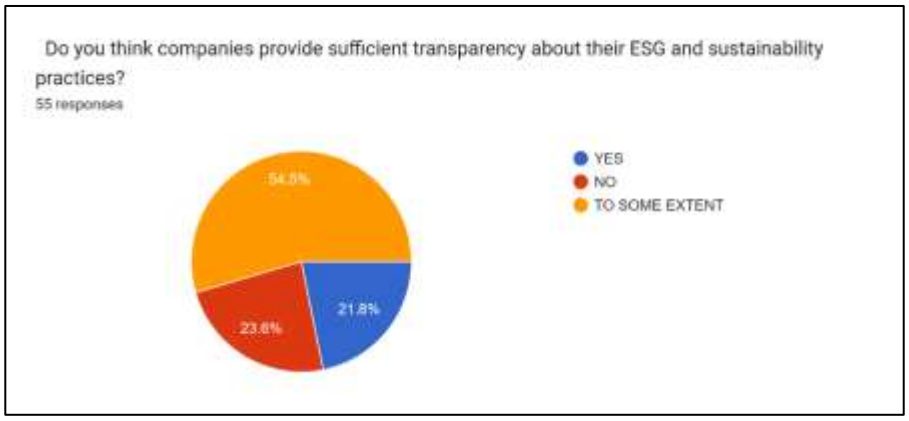

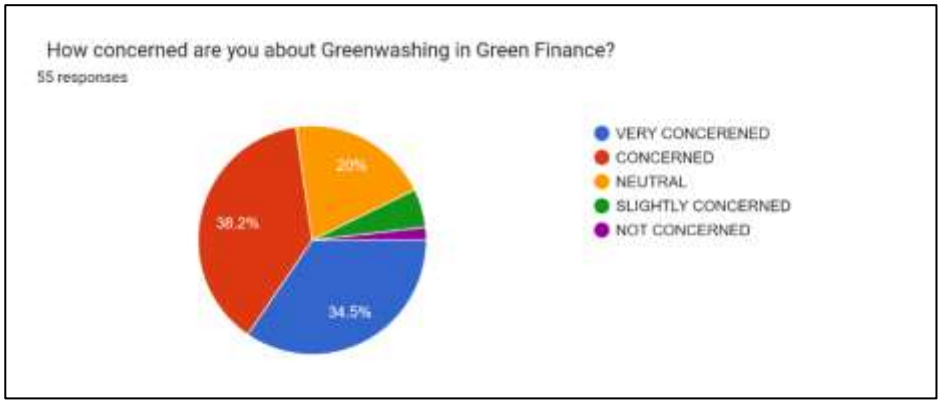

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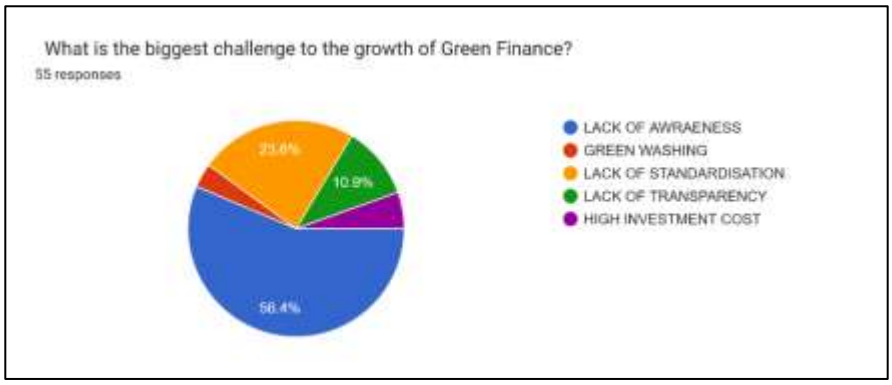

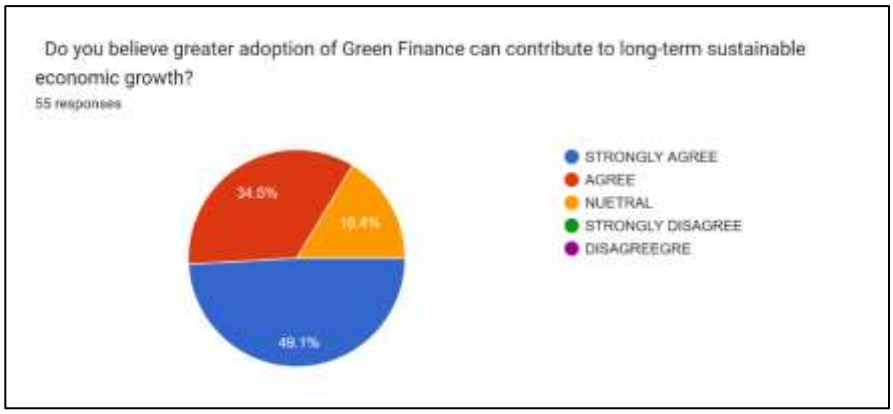

Limitation of Study :

1. Limited Sample Size: The study is based on only 55 respondents, which may not fully represent the broader population.
2. Geographical Limitation: The findings may be influenced by the location and background of the respondents.
3. Limited Awareness: Some respondents may have had limited knowledge of green finance and ESG concepts, affecting their responses.
4. Time Constraint: The study was conducted within a limited period, restricting the scope of data collection and analysis.
5. Response Bias: The findings depend on self-reported responses, which may be influenced by personal opinions or perceptions.
6. Limited Financial Instruments: The study focuses mainly on selected green finance instruments and may not cover all available sustainable financial products.
7. Generalisation: The findings may not be applicable to all investors or financial markets due to the limited sample and research scope.

Scope of the Study :

The present study focuses on understanding the role and importance of Green Finance in promoting sustainable development, with particular emphasis on the relationship between Green Finance, ESG considerations, environmental protection, responsible investment and sustainable economic growth.

The study covers respondents from different demographic and socio-economic backgrounds, including students, salaried employees, self-employed/business

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owners, retired individuals and other respondents. The questionnaire also considers demographic characteristics such as age group, gender, location type and occupation to understand the profile of the respondents.

The study examines respondents' understanding of Green Finance, particularly their perception of financing activities that support environmentally friendly and sustainable initiatives, reduce carbon emissions, address climate change and protect natural resources and biodiversity. It also examines respondents' familiarity with major Green Finance instruments, including green bonds, sustainable loans, ESG investments and green funds.

The scope further extends to the role of ESG considerations in investment decisions and respondents' perceptions regarding the ability of Green Finance to reduce environmental risks and climate change. It also evaluates perceptions about the effectiveness of Green Finance in promoting social and economic development.

Another important area covered by the study is the credibility and transparency of Green Finance. The questionnaire examines whether respondents believe companies provide sufficient transparency regarding their ESG and sustainability practices and assesses their level of concern about greenwashing.

The study also identifies major challenges that may restrict the growth of Green Finance, including lack of awareness, greenwashing, lack of standardisation, lack of transparency and high investment costs. Finally, the study examines respondents' perceptions regarding whether greater adoption of Green Finance can contribute to long-term sustainable economic growth.

Thus, the scope of the study is primarily perception- and awareness-based and does not attempt to measure the actual financial performance of specific green financial instruments or the actual environmental impact generated by individual companies or investments. The findings will be based on the responses collected through the structured questionnaire and will therefore reflect the perceptions and awareness of the respondents included in the study.

Recommendations:

- Organizations should increase investment in green and sustainable projects.
- Governments should develop clear regulations and standards for green finance and ESG reporting.
- Companies should improve transparency and disclosure to reduce greenwashing.
- Financial institutions should promote green bonds, sustainable loans and ESG-linked investments.
- Investors should consider ESG performance along with financial returns when making investment decisions.

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Conclusion :

Green finance is an important tool for achieving environmental sustainability and responsible economic growth. The study shows that green finance supports ESG objectives by encouraging environmentally friendly investments, social development and better governance. Although challenges such as greenwashing and lack of standardization exist, stronger regulations and transparency can improve its effectiveness. Overall, integrating **green finance with ESG practices** can contribute significantly to a sustainable and low-carbon future.

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- *UNEP – Green finance initiatives*
- *International Finance Corporation (IFC) – Sustainable and green finance.*

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A STUDY ON THE IMPACT OF AI-POWERED ESG INVESTING ON PORTFOLIO PERFORMANCE IN MUMBAI

Dr. Sangeeta Kanojia
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Abstract:
The motive of this research is to understand the influence of ESG investing with the help of Artificial Intelligence (AI) on the performance of investment portfolios in Mumbai. It identifies the level of awareness and the extent to which AI generated insights are taken into consideration, and if its use has a positive influence on returns and risk management. Data collection was done using a questionnaire through google forms and analysed using percentage method. The results show that through the use of ESG tools powered by AI is still in the early stages, but can indeed enhance portfolio performance.
Key words: *Artificial Intelligence, ESG investing, Portfolio performance.*

Introduction:

While investing factors such as return and risk are considered in addition to market conditions and financial performance to make investment decisions. With the increasing rise of social awareness and sustainability practices, new factors of Environmental, Social and Governance (ESG) principles have entered the world of finance and investment decision making process. ESG investing combines these principles with traditional financial indicators hence facilitating the assessment of sustainability of the company and long term risks. In India, the introduction of the framework of BRSR by SEBI has made ESG related information more accessible than ever.

Extraction and compilation of ESG data from multiple sources can be a tedious task since the ratings and reporting systems differ from source to source. Using Artificial Intelligence (AI), the analysis of this data can be done more efficiently therefore mobilising investment decisions

Therefore, the present study examines the impact of AI- Powered ESG investing on Portfolio Performance in Mumbai and analyse investors awareness and usage of AI based ESG data along with their opinions on its overall impact on portfolio returns and risk management.

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Objectives of Study:

1. To assess investors' awareness and understanding of AI-powered ESG investing.
2. To examine investors, use of AI-generated ESG insights while making investment decisions.
3. To evaluate investor's perceptions towards the impact of AI-powered ESG
4. To suggest suitable measures.

Hypothesis:

1. Null Hypothesis (H_0): There is no significant relationship between investors' use of AI-powered ESG investing and their perceived portfolio performance.
2. Alternative Hypothesis (H_1): There is a positive relationship between investors' use of AI-powered ESG investing and their perceived portfolio performance.

Literature Review

1. **Inampudi and Macpherson (2020)** conducted research on the "Influence of Artificial Intelligence (AI) on ESG investing". In their research, the authors point out that AI and machine learning enable investors to analyse vast amounts of financial and non-financial information related to ESG research, ESG screening, and ESG analysis more efficiently. In addition to this, various challenges connected with governance and ethics were highlighted. Overall, this study demonstrates the great future scope of AI in the process of making ESG investment decisions.
2. **Jain et al. (2026)** in their article "AI is affecting ESG investment evaluations and the behaviours of investors". 105 investors and finance professionals were surveyed, and it was shown that higher levels of AI competence and knowledge brought about more confidence in investors. However, AI usage seemed to be less straightforward more complicated than anticipated.
3. **Bhanusreeja (2024)** in his paper "The Impact of Artificial Intelligence in Financial Services – Fintech "examined how AI affects financial services, particularly FinTech. This research suggests that AI technologies like machine learning and predictive analytics have enhanced the efficiency, accuracy and safety of financial services. AI is important for investment decisions, risk assessments, fraud detection, and personalized financial services. This research reflects the increased usage of Artificial Intelligence in improving financial decisions and investment strategies.

Research Methodology:

Sources:

The study conducted majorly relies on **Primary Data**, which is directly derived from investors in Mumbai through a structured questionnaire which covers ESG awareness, AI powered ESG investing, use of AI-generated ESG insights, and perceptions of portfolio returns and risk. **Secondary Data** is extracted from research

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papers, academic journals, SEBI publications, financial reports, and online websites associated to the topic of research.

Information collected is classified and processed to draw the conclusion for this study Appropriate statistical tools are used for the same. The other tools used for presentation of data include tables, diagrams, bar charts, column and pie diagrams.

Data Analysis :

1. Age

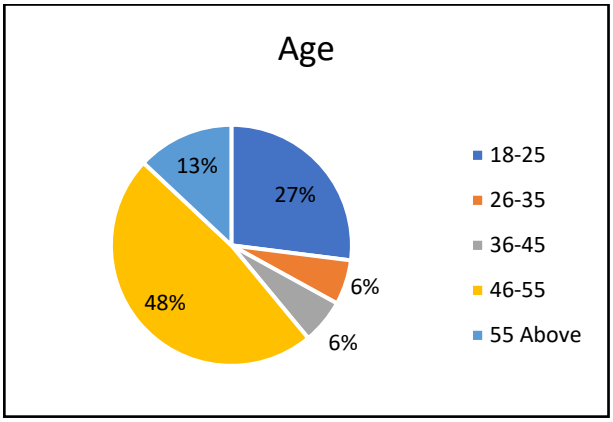
Table 1

Age

Age	Frequency	Percentage
18-25	27	27
26-35	6	6
36-45	6	6
46-55	48	48
55 Above	13	13
Total	**100**	**100**

Source: Primary Data

Graph 1



The above table and diagram indicates the age distribution of the respondents. A majority belong to the age group of 46-55 years, signifying that mainstream of the participants are middle aged investors.

2. Gender

Table 2

Gender	Frequency	Percentage
Male	30	30
Female	70	70
Total	**100**	**100**

Source: Primary Data

Graph 2

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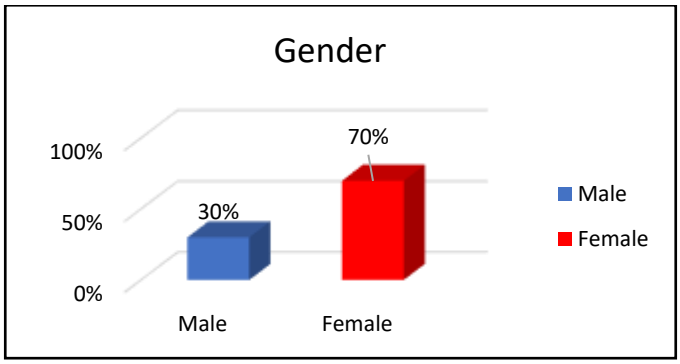

The table and diagram above shows that out of the respondents the majority are female investors.

1. **Investors Perception of Impact of AI-Powered ESG Investing on Portfolio Performance.**

Table 3.

Sr.no	Statements	Yes (Percentage)	No (Percentage)
1.	I use AI-powered tools to analyse ESG information and make investment decisions.	37	63
2.	I use AI-powered tools to identify investment opportunities based on ESG factors.	41	59
3.	I use AI-powered tools to assess ESG-related risks associated with investments.	37	63
4.	I use AI-generated insights or recommendations when evaluating ESG investments.	40	60
5.	AI-powered ESG analysis plays an important role in my investment decisions.	40	60
6.	I use AI-powered tools to compare companies based on their ESG performance.	39	61
7.	I regularly use AI-powered tools when making or reviewing ESG-related investment decisions.	41	59
8.	Using AI-powered ESG investing has improved the returns of my investment portfolio.	45	55

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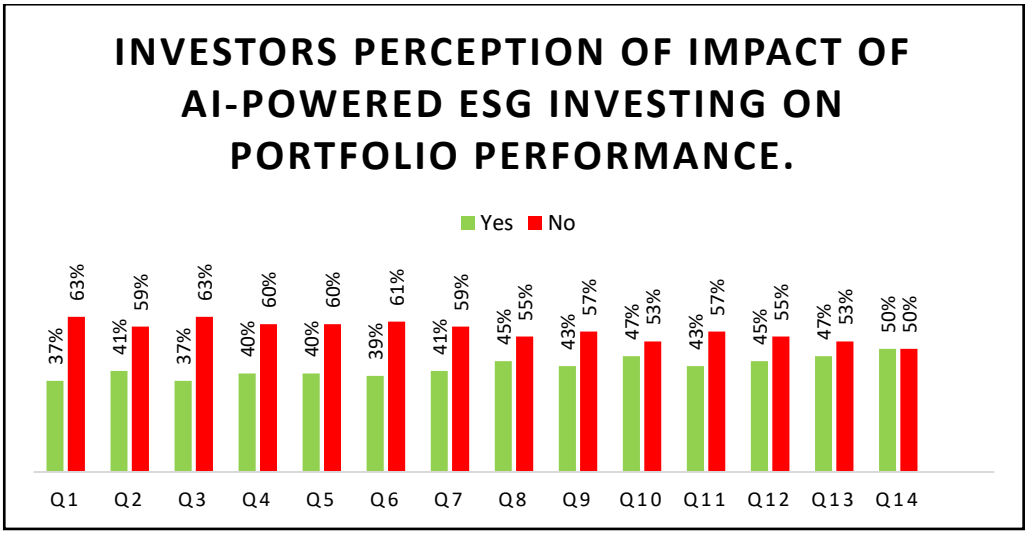
9.	Using AI-powered ESG investing has helped me manage portfolio risk more effectively.	43	57
10.	Using AI-powered ESG investing has improved the diversification of my portfolio.	47	53
11.	Using AI-powered ESG investing has helped me identify better investment opportunities.	43	57
12.	Using AI-powered ESG investing has improved the quality of my investment decisions.	45	55
13.	Using AI-powered ESG investing has helped me respond more effectively to changing market conditions.	47	53
14.	Overall, I believe that using AI-powered ESG investing has improved my portfolio performance.	50	50

Graph 3:



Testing of Hypothesis

1. The stated hypothesis "There is significant relationship between investors' use of AI-powered ESG investing and their perceived portfolio performance" is **accepted** on the findings of table and graph 3. It indicates that a fair number of respondents use AI powered ESG investing and agree that it enhances portfolio returns, risk management, diversification, investment opportunities and overall performance of the portfolio.

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2. The stated hypothesis "There is a no significant relationship between investors use of AI-powered ESG investing and their perception of portfolio performance" is hence **Rejected** as, it is observed that AI powered ESG investing does in fact have a positive impact on investors perspective.

Findings:

This study shows that the knowledge and use of AI enabled ESG investing is still in the initial infancy stage with only 37% to 41% of individuals surveyed that either actively use or have used such AI powered ESG investment tools. A significant number have agreed that it positively boosts returns, minimise risks, identifies better investment options, improves diversification, and helps to improve the decision making process.

Suggestions:

Based on the findings, there should be an increase in the efforts put into increasing the awareness of AI-based ESG investing and its practical use among investors in Mumbai. To achieve this positive outcome financial institutions should offer seminars and training to impart knowledge on how to use AI based ESG tools. In addition to that, better regulation of the availability and quality of the ESG data needs to be improved for more efficient use of AI analytics and to enhance investment decision-making.

Conclusion:

AI powered ESG investing has shown substantial perceived impact on investment portfolio performance. Though still scarcely used at present, it is seen that investors are aware of its positive effects on return, risk management strategies, investment opportunities and making better investment decisions. Increased knowledge and access to trustworthy AI powered ESG solutions can make investors more aware of its effectiveness.

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FROM RETURNS TO RESPONSIBILITY: EXPLORING THE INFLUENCE OF ESG AWARENESS ON SUSTAINABLE INVESTMENT DECISIONS AMONG YOUNG INVESTORS IN INDIA

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Abstract:
This study examines ESG awareness and its influence on sustainable investment behaviour among young investors in India. The study is based on primary data collected from 250 young investors through a structured questionnaire using a 5-point Likert scale. The findings show that respondents have a good level of ESG awareness. ESG awareness has a strong positive relationship with sustainable investment behaviour and is the strongest predictor of such behaviour. Expected financial returns also significantly influence investment decisions, while perceived investment risk does not have a significant independent effect. The study highlights the importance of ESG awareness, financial literacy, and transparent ESG information in encouraging young investors to make responsible and sustainable investment decisions.
Keywords: *ESG Awareness, Sustainable Investment, Young Investors, Investment Behaviour, Financial Returns, Investment Risk.*

Introduction:

Investment decisions are no longer based only on financial returns. Today, investors also consider a company's Environmental, Social, and Governance (ESG) performance. ESG focuses on a company's environmental responsibility, social practices, and governance standards. Growing concerns about climate change, pollution, ethical practices, and social responsibility have made ESG investing an important part of sustainable finance.

According to PRI (2025), more than 5,000 organisations, representing over USD 120 trillion in assets under management, have committed to responsible investment practices. In India, SEBI's BRSR framework promotes greater transparency in the sustainability practices of leading listed companies.

The number of young investors in India is also increasing, supported by online trading apps and digital investment platforms. However, many young investors may have limited awareness of ESG factors and continue to focus mainly on financial returns.

Therefore, this study aims to assess ESG awareness among young investors and examine its influence on their sustainable investment decisions.

Review of Literature:

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A) ESG Awareness and Sustainable Investment

1. **Filippini, Leippold and Wekhof (2024), "Sustainable Finance Literacy and the Determinants of Sustainable Investing"** found that limited sustainable finance knowledge affects investors' sustainable investment decisions.
2. **Filippini, Leippold and Wekhof (2026), "The Impact of Sustainable Finance Literacy on Investment Decisions"** found that better ESG knowledge increases preference for sustainable investments.

B) ESG and Financial Returns

1. **Friede, Busch and Bassen (2015), "ESG and Financial Performance: Aggregated Evidence from More Than 2,000 Empirical Studies"** reviewed 2,000+ studies and found that ESG practices generally do not negatively affect financial performance.

C) ESG, Returns and Risk

1. **Banerjee and David (2024), "Does ESG Really Matter? Accessing the Relevance of ESG in Indian Investors' Decision-Making Dynamics"** found that Indian investors consider ESG, but returns and risk remain more important in investment decisions.

D) Young Investors and Sustainable Investment

1. **Sunil (2026), "Assessing the Perception and Adoption of Sustainable Investment Among Indian Millennials and Generation Z"** found that ESG awareness, expected returns, risk and trust influence sustainable investment among Indian Millennials and Gen Z.
2. **Bajaj, Dawar and Arora (2026), "Green Tax Awareness and Sustainable Investment Behaviour among Young Investors in India"** highlighted the importance of ESG knowledge, financial literacy and environmental concern in sustainable investment behaviour.

Research Gap: Existing studies highlight ESG awareness and sustainable investing, but there is a need to further examine how ESG awareness influences sustainable investment decisions among young investors in India.

Research Methodology:

Objectives of the Study:

1. To assess the level of ESG awareness among young investors in India.
2. To examine the relationship between ESG awareness and sustainable investment behaviour among young investors in India.
3. To examine the influence of ESG awareness, expected financial returns and perceived investment risk on sustainable investment behaviour among young investors in India.

2. Hypothesis of the Study

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H_{11}: There is a significant positive relationship between ESG awareness and sustainable investment behaviour among young investors in India.

H_{12}: ESG awareness significantly influences sustainable investment behaviour among young investors in India.

H_{1a3}: Expected financial returns significantly influence sustainable investment behaviour among young investors in India.

H_{1b3}: Perceived investment risk significantly influences sustainable investment behaviour among young investors in India.

3. **Scope of the Study:** The study focuses on young investors in India and examines their ESG awareness and its influence on sustainable investment decisions. It covers awareness of environmental, social, and governance factors, along with the role of financial returns, risk, and trust in ESG information in investment decisions.
4. **Data Collection:** The study uses both primary and secondary data. Primary data was collected from 250 young investors through a structured questionnaire. Secondary data will be obtained from research papers, journals, books, SEBI and PRI reports, government publications, and reliable websites related to ESG and sustainable investment.

Data Analysis and Interpretation:

1. **Reliability Analysis**: Cronbach's Alpha was used to assess the internal consistency of the research constructs.

Construct	No. of Items	Cronbach's Alpha	Interpretation
ESG Awareness	9	0.951	Excellent
Sustainable Investment Behaviour	5	0.935	Excellent
Expected Financial Returns	3	0.867	Good
Perceived Investment Risk	3	0.876	Good

2. **Objective-wise Analysis**

Objective 1: To assess the level of ESG awareness among young investors in India.

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ESG Awareness Statement	Mean	Std. Deviation
Awareness of environmental impact of business	3.5	1.606
Awareness of climate change, pollution and waste	3.368	1.127
Importance of environmental practices to investors	3.344	1.309
Awareness of fair treatment of employees	3.296	1.386
Awareness of employee welfare, equality and human rights	3.492	1.142
Importance of social practices to investors	3.516	1.23
Awareness of ethical and transparent business practices	3.396	1.411
Awareness of corporate governance	3.408	1.095
Importance of governance practices to investors	3.416	1.3
Overall ESG Awareness	**3.415**	**1.1**

Interpretation: The overall mean score of 3.415 suggests that young investors possess a fairly strong level of ESG awareness. Among the various aspects, respondents showed greater awareness of the importance of social practices in investment decisions (Mean = 3.516) and the environmental impact of business activities (Mean = 3.5).

RO1 is achieved: The findings indicate that young investors included in the study demonstrate a good level of awareness regarding ESG-related factors.

Objective 2: To examine the relationship between ESG awareness and sustainable investment behaviour among young investors in India.

H_{01}: There is no significant relationship between ESG awareness and sustainable investment behaviour among young investors in India.

H_{11}: There is a significant positive relationship between ESG awareness and sustainable investment behaviour among young investors in India.

Test Applied: Pearson Correlation

Variables	r	p-value	N

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ESG Awareness ↔ Sustainable Investment Behaviour	0.855	< 0.001	250

Interpretation: The Pearson correlation coefficient is 0.855, indicating a strong positive relationship between ESG awareness and sustainable investment behaviour. The relationship is statistically significant because $p < 0.001$. This means that respondents with higher ESG awareness tend to show stronger sustainable investment behaviour.

Decision: Since $p < 0.05$, H_{01} is rejected and H_{11} is supported.

RO2 is achieved: There is a strong, positive and statistically significant relationship between ESG awareness and sustainable investment behaviour.

Objective 3: To examine the influence of ESG awareness, expected financial returns and perceived investment risk on sustainable investment behaviour among young investors in India.

Test Applied: Multiple Linear Regression

Dependent Variable: Sustainable Investment Behaviour

Independent Variables: ESG Awareness, Expected Financial Returns & Perceived Investment Risk

Model Summary:

R	R^2	Adjusted R^2	F	p-value
0.872	0.76	0.757	260.03	< 0.001

Interpretation: The regression model is statistically significant ($F = 260.030$, $p < 0.001$). The R^2 of 0.760 indicates that ESG awareness, expected financial returns and perceived investment risk collectively explain approximately 76.0% of the variation in sustainable investment behaviour.

Regression Coefficients:

Predictor	β	t-value	p-value	Decision
ESG Awareness	0.516	7.404	<0.001	Significant
Expected Financial Returns	0.337	4.202	<0.001	Significant
Perceived Investment Risk	0.049	0.792	0.429	Not Significant

H2 – ESG Awareness

H_{12}: ESG awareness significantly influences sustainable investment behaviour among young investors in India.

ESG awareness has a positive and significant influence on sustainable investment behaviour ($\beta = 0.516$, $p < 0.001$).

Decision: Since $p < 0.05$, H_{02} is rejected and H_{12} is supported.

Interpretation: ESG awareness is an important predictor of sustainable investment

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behaviour. Higher awareness is associated with stronger sustainable investment behaviour.

H3a – Expected Financial Returns

H_{1a3}: Expected financial returns significantly influence sustainable investment behaviour among young investors in India.

Expected financial returns have a positive and significant influence on sustainable investment behaviour ($\beta = 0.337$, $p < 0.001$).

Decision: Since $p < 0.05$, H_{0a3} is rejected and H_{1a3} is supported.

Interpretation: Young investors consider the potential financial returns while making sustainable investment decisions.

H3b: Perceived Investment Risk

H_{1b3}: Perceived investment risk significantly influences sustainable investment behaviour among young investors in India.

Perceived investment risk has a small positive but statistically insignificant influence ($\beta = 0.049$, $p = 0.429$).

Decision: H_{1b3} is not supported.

Interpretation: Perceived investment risk does not have a significant independent influence on sustainable investment behaviour when ESG awareness and expected financial returns are considered simultaneously.

Findings of the Study:

1. Young investors show a good level of ESG awareness, with an overall mean score of 3.415.
2. ESG awareness has a strong positive relationship with sustainable investment behaviour ($r = 0.855$, $p < 0.001$).
3. ESG awareness significantly influences sustainable investment behaviour ($\beta = 0.516$, $p < 0.001$).
4. Expected financial returns also significantly influence sustainable investment behaviour ($\beta = 0.337$, $p < 0.001$).
5. Perceived investment risk does not have a significant independent influence on sustainable investment behaviour ($\beta = 0.049$, $p = 0.429$).
6. The three factors collectively explain 76% of the variation in sustainable investment behaviour.
7. Overall, the findings highlight ESG awareness as the strongest predictor of sustainable investment behaviour among the young investors studied.

Recommendations:

1. Increase ESG awareness through financial literacy programmes, workshops and investor education.
2. Provide transparent ESG information to help young investors evaluate sustainable

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investment opportunities.

3. Promote ESG-based investment products with clear information on both sustainability performance and expected returns.
4. Integrate ESG education into colleges and financial institutions to encourage responsible investment habits among young investors.
5. Strengthen investor awareness of ESG risks and benefits so that investment decisions balance financial returns with long-term sustainability.
6. Encourage companies and financial institutions to improve ESG disclosure and avoid misleading sustainability claims.

Conclusion: The study concludes that young investors have a good level of ESG awareness, and this awareness has a strong positive influence on sustainable investment behaviour. Expected financial returns also play an important role, while perceived investment risk does not have a significant independent influence. Overall, the findings highlight the importance of ESG awareness and financial literacy in encouraging young investors to make more responsible and sustainable investment decisions.

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A STUDY ON EFFECTIVENESS OF TRADITIONAL BOARD VS. SMART BOARD TEACHING METHOD: A PERCEPTION OF UNDER GRADUATE COMMERCE

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Abstract:
In Indian commerce and arts classrooms, higher education is moving from the traditional chalk-and-talk method of teaching to technology-mediated pedagogy. The paper discusses traditional board and smart board (interactive white board) teaching through secondary data with focus on undergraduate students in the Mumbai region. We synthesize evidence on engagement, comprehension, retention, accessibility and infrastructure, drawing on published cross-sectional studies, institutional reports, policy documents and theoretical frameworks such as the Technology Acceptance Model (TAM) and Cognitive Theory of Multimedia Learning. Results show that smart boards are preferred for interactivity, multimedia integration and alignment to the National Education Policy (NEP) 2020, whereas traditional boards are still useful for simplicity, reliability and low infrastructure needs in resource limited settings. A blended, context-sensitive model is proposed to substitute the undergraduate commerce education in Mumbai.
Keywords: *Smart board, traditional board, undergraduate education, teaching effectiveness, perception of students, NEP 2020.*

Introduction:

Traditionally, the delivery of content in Indian higher education classrooms was done using blackboards or whiteboards. The chalk-and-talk method is pedagogically simple, immediate, cheap and does not depend on electronic infrastructure. Recently, Information and Communication Technology (ICT) has introduced the smart board or interactive whiteboard (IWB) as an alternative combining text, audio-visual content and real-time interactive.

The National Education Policy (NEP) 2020 emphasizes on digital pedagogy and technology-enabled learning as the core of reforms. In Mumbai, the metropolitan colleges have more investment in infrastructure and more exposure to technology among the students, hence more use of smart boards. However, the perceived pedagogical effectiveness of this transition for undergraduates requires further investigation.

Subjects such as accountancy, cost-accounting, taxation etc. in the undergraduate commerce programs need sequential numerical working and step-by-step real-time

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derivations, while business communication is apt for case studies and visual illustrations. This simplistic view that either the smart board is better or the traditional board is better is not sufficient. This paper seeks to fill this gap by undertaking an analytical review of the secondary literature on commerce and allied education in Mumbai.

Review of Literature:

Comparative insights are also available from cross-sectional studies in Indian higher-education settings. A study among undergraduates in Chennai showed that smart boards were strongly preferred to blackboards in terms of interest, time optimization and interaction in the classroom. Similarly, a study by a dental college in Chennai showed that 61% preferred smart boards for efficiency and 39% preferred blackboards for simplicity. A teacher-attitude study using paired-comparison tests found smart boards significantly increased learning outcomes over blackboards.

In contrast, the evidence is not uniformly pro-digital. A study of medical students found that preferences varied across cohorts not only by the medium but also by subject complexity and teacher-student interaction. In an exploratory study of PowerPoint-mediated teaching, students appreciated the visual organization but reported less note-taking engagement and lower retention than from board explanations . Research into teacher-centred and student-centred methods suggests that undergraduates appreciate a mix of approaches, showing that the effectiveness of a tool depends on how it is used.

The theoretical basis is based on two frameworks: Technology Acceptance Model (TAM) : readiness to accept a technology is defined by perceived ease of use and perceived usefulness. Acceptance of smart boards is dependent on ease of integration in pedagogical routines.

Cognitive Theory of Multimedia Learning: Well-designed combinations of words and pictures improve understanding, but poorly designed combinations lead to cognitive overload.

The digitalization of commerce education in India is transforming the pedagogy from blackboards to more dynamic and technology-enhanced methods, although in an uneven manner owing to limitations of infrastructure and training. Market data supports this as India’s interactive-whiteboard market has a small share of the global market despite government efforts to promote digital classrooms.

Objectives of the Study:

1. To compare traditional board and smart board teaching methods on engagement, comprehension and accessibility based on existing literature.
2. To study the framing of smart board adoption in Indian undergraduate education in NEP 2020.

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3. To view these findings in the perspective of undergraduate commerce and arts colleges of Mumbai region and to suggest a balanced pedagogical approach.

Research Methodology:

This descriptive-analytical research is completely based on secondary data from peer-reviewed journals, conference papers, institutional/government policy documents (NEP 2020), and industry reports on educational technology in India. The sources were chosen for their relevance to undergraduate and higher education settings, for their comparative treatment of traditional boards versus tech-mediated teaching aids, and for their applicability to Indian and Mumbai contexts.

The data was organized around five parameters: engagement; comprehension and retention; accessibility; infrastructural dependency; and policy alignment. As a secondary-data study, it synthesizes existing evidence, in published form, rather than generating new primary survey data from Mumbai students.

Comparative Analysis:

Parameter	Traditional Board	Smart Board
Content delivery	Static, text/diagram based, dependent on instructor handwriting speed	Multimedia-based; supports text, images, audio, video and animation simultaneously
Student engagement	Largely passive listening and note-copying	Higher interactivity through quizzes and real-time polls
Preparation time	Low; minimal pre-class setup	Higher; requires slide/content preparation and technical readiness
Retention of material	Erased after class; no digital record	Content can be saved, shared and revisited
Technical dependency	None; usable during power or network failure	Dependent on electricity, software and hardware functioning
Cost and maintenance	Low-cost, chalk/duster based	High initial investment; recurring maintenance and training cost
Accessibility	Limited for students seated far from board	Improved visibility through large display and zoom features

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Alignment with NEP 2020	Limited alignment with digital-literacy goals	Directly supports NEP 2020's digital pedagogy and skill-based learning objectives

Smart boards are better than traditional boards in terms of engagement and multimedia comprehension. This is consistent with TAM's perceived usefulness and dual-channel processing theory. Traditional boards are great for reliability, cost constraints and resource constrained environments. Higher urban infrastructure and tech familiarity favor smooth smart board adoption for Mumbai commerce colleges. But there are still sequential numerical working subjects (accountancy, taxation) that benefit from the erasable working space of traditional boards.

Findings:

1. The undergraduates in general prefer smart boards because of its interactive features, clear visuals and multimedia integration.
2. Not unanimous preference: Some students like the simplicity and less cognitive complexity of traditional boards for sequential derivations.
3. Effectiveness is more a function of the structuring and pacing of the teacher than of the medium alone.
4. Smart board is recommended in NEP 2020 but its implementation is not uniform in real life and is dependent on infrastructure.

Limitations of the Study:

This study relies on secondary data from a variety of geographical and disciplinary settings and is not specific to Mumbai or undergraduate commerce education. Therefore, findings are predicated on general trends rather than direct empirical assessments of Mumbai students' perceptions. Direct comparability is limited by differences in methodology and samples across sources.

Conclusion and Suggestions:

Smart boards have unique benefits for engagement, multimedia delivery and policy alignment. Traditional boards are essential for reliability, cost-efficiency and sequential numerical instruction. For undergraduate colleges, the mode of instruction should be a mix of the traditional and the modern. Smart boards should be used for conceptual and case based topics, and for numerical problems in accountancy and taxation, the traditional boards should be used.

Recommendations:

Perceived ease of use was improved by developing formal faculty training.

Massive infrastructural investments to avoid over-reliance in areas with poor power or connectivity.

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To validate these patterns, we conducted primary survey research amongst commerce undergraduates in the Mumbai-region.

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(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
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ETHICAL LEADERSHIP AND ITS IMPACT ON EMPLOYEE PERFORMANCE AND ORGANISATIONAL SUCCESS: AN ESG PERSPECTIVE

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Abstract:
Ethical leadership has gained increasing importance as organisations move beyond a narrow focus on financial performance towards responsible and sustainable business practices. In the context of Environmental, Social and Governance (ESG), ethical leadership can influence employee behaviour, engagement, commitment, trust and organisational performance.

Keywords: *Ethical leadership, employee engagement, sustainable business practices, environmental, social, governance.*

Introduction:

Leadership plays an important role in the success of every organisation. A good leader not only focuses on achieving organisational goals but also treats employees fairly and responsibly.

Brown et al. (2005) defined ethical leadership as "the demonstration of normatively appropriate conduct through personal actions and interpersonal relationships" (p. 120).

In today's business environment, organisations are increasingly focusing on **Environmental, Social and Governance (ESG)** practices. ESG helps organisations consider their impact on the environment, employees and society. Ethical leadership is closely connected with ESG because ethical leaders encourage responsible behaviour, fairness, employee welfare and transparent decision-making.

Objectives of the Study:

The main objectives of the study are:

1. To understand the concept and characteristics of ethical leadership.
2. To examine the relationship between ethical leadership and employee performance.
3. To examine the relationship between ethical leadership and organisational success.
4. To analyse the role of ethical leadership in supporting ESG practices.
5. To examine the influence of ethical leadership on employee motivation, trust, job satisfaction and commitment.

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6. To understand the contribution of ethical leadership to responsible and sustainable organisational development.

Review of the Literature:

Khuntia and Suar (2004) developed a scale for assessing ethical leadership among managers in Indian private and public sector organisations. Their study identified empowerment and motive and character as important dimensions of ethical leadership. The study also indicated that ethical leadership was associated with positive employee outcomes, including job performance, job involvement and affective commitment

Agarwal and Bhargava (2014) examined social exchange relationships and work outcomes among Indian managers. Their study found that leader–member exchanges and perceived organisational support were associated with psychological contract outcomes, while trust in the employer was related to important work outcomes such as affective commitment, intention to quit and innovative work behaviour. The study highlights the importance of positive relationships and trust between employees and organisations.

The Securities and Exchange Board of India (SEBI) has strengthened the ESG reporting framework through the Business Responsibility and Sustainability Reporting (BRSR) framework, increasing the importance of sustainability, social responsibility and governance-related disclosures by listed entities (Securities and Exchange Board of India, 2021).

Ethical Leadership and ESG

Environmental:

Ethical leaders can encourage responsible resource use, environmental compliance and sustainability initiatives.

Social:

Ethical leadership supports employee welfare, fairness, diversity, human rights, workplace safety and stakeholder responsibility.

Governance:

Ethical leadership supports transparency, accountability, integrity, compliance and responsible decision-making.

Hypothesis of the Study:

H_{01}: Ethical leadership has no significant relationship with employee performance.

H_{11}: Ethical leadership has a significant positive relationship with employee performance.

H_{02}: Ethical leadership has no significant relationship with organisational success.

H_{12}: Ethical leadership has a significant positive relationship with organisational success.

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The hypotheses are proposed as conceptual propositions based on the findings of previous studies. Since the present study is based on secondary data and descriptive analysis, no statistical hypothesis testing is undertaken.

Scope of the Study:

The scope of the study is mainly related to ethical leadership, employee performance, organisational success and ESG.

1. Meaning and characteristics of ethical leadership.
2. Impact of ethical leadership on employees.
3. Employee motivation, satisfaction and commitment.
4. Relationship between ethical leadership and organisational performance.
5. Role of ethical leadership in ESG practices.
6. Importance of responsible and transparent management.
7. Contribution of ethical leadership towards long-term organisational success.

The study is based on information available through secondary sources such as research papers, books, journals, reports and reliable websites.

Research Methodology:

Research Design:

The present study adopts a descriptive research design and is based on secondary data collected from research articles, books, institutional reports, government documents and other reliable sources.

Selection of secondary sources:

Relevant academic articles, books, government publications, regulatory documents, sustainability reports and institutional reports were selected based on their relevance to ethical leadership, employee performance, organisational success and ESG practices. Preference was given to peer-reviewed academic sources and official government and regulatory publications.

Method of Analysis:

The collected information is analysed using a **descriptive approach**. The study compares and summarises findings from previous research to understand the impact of ethical leadership on employees and organisations.

Variables of the Study:

Key Concepts/Variables Considered

- Ethical Leadership
- Employee Performance
- Organisational Success
- ESG Practices

Limitations of the Study:

1. The study is based only on secondary data.
2. No primary survey or personal interviews were conducted.

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3. The findings depend on the availability and quality of existing literature.
4. Different organisations may have different leadership practices.
5. The study focuses mainly on the relationship between ethical leadership, employee performance, organisational success and ESG.
6. The findings may not be applicable equally to every organisation or industry.
7. Since the study is descriptive in nature, it does not establish a cause-and-effect relationship through statistical testing.

Findings of the Study:

1. Ethical leadership can strengthen employee commitment towards the organisation.
2. Better employee performance can contribute to organisational success.
3. Ethical leadership supports responsible decision-making.
4. Ethical leadership is closely related to the Social and Governance aspects of ESG.
5. Organisations following ethical leadership practices can build a better reputation among employees and other stakeholders.
6. Ethical leadership can support long-term and sustainable organisational growth.

Conclusion:

From an ESG perspective, ethical leadership is especially important because organisations are expected to consider not only financial performance but also their responsibilities towards employees, society and other stakeholders. Ethical leadership supports responsible governance and promotes socially responsible business practices.

In conclusion, ethical leadership is beneficial for employees and is positively associated with organisational outcomes. It also supports responsible governance and provides a strong foundation for integrating ESG principles into organisational practices.

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(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
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SUSTAINABLE ALTERNATIVES TO PLASTIC DAIRY PACKAGING: A CORPORATE SUSTAINABILITY AND ESG PERSPECTIVE

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Abstract:
The dairy industry has long depended on plastic pouches for their low cost and reliable protection, but this same packaging can persist in the environment for decades, putting the sector under growing pressure from regulators, investors, and consumers. This study uses Mother Dairy's naturally degradable milk pouch as a case study to explore how dairy companies can respond. Instead of switching to glass or cartons — which would require overhauling filling lines and distribution nationwide — Mother Dairy modified the plastic itself, adding technology that allows it to degrade naturally while keeping shelf life, safety, and food-contact compliance unchanged. Third-party RDK certification adds credibility, guarding against greenwashing concerns. Overall, the case shows meaningful sustainability progress is possible without a full infrastructural overhaul, offering a practical model other dairy companies can realistically follow.

Introduction:
Packaging plays an indispensable role in the dairy value chain. Milk, yogurt, cheese, butter, and related products are highly perishable, biologically active, and sensitive to oxygen, light, moisture, and microbial contamination. For decades, plastics — including HDPE bottles, polypropylene (PP) yogurt cups, and multilayer paperboard-plastic-aluminium laminates — have been the material of choice because they are lightweight, low-cost, moisture- and gas- resistant, and compatible with high-speed filling lines. However, the same properties that make plastic packaging effective also make it a significant environmental liability: most dairy plastics are single-use, many multilayer formats are difficult or uneconomic to recycle, and the sector's packaging footprint contributes materially to corporate greenhouse gas accounting and to marine and terrestrial plastic pollution. The dairy packaging industry, valued at tens of billions of dollars, continues to grow, driven by demand for convenience and the expansion of online shopping. However, packaging is no longer merely a cost or logistics consideration; it has become a significant sustainability issue.

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Investors, regulators, retailers, and consumers increasingly expect dairy companies to reduce plastic use, adopt more recyclable materials, and demonstrate measurable progress toward a circular and waste-conscious system. Consequently, what was once a behind-the-scenes operational concern is now an important issue in corporate boardrooms. This paper examines sustainable alternatives to replace or reduce conventional plastic packaging in the dairy sector. It anaylzes their adoption through the lenses of corporate sustainability strategies and ESG reporting frameworks.

Review of Literature:

Sarenkova et al. (2025), Biodegradable Coatings and Packaging Solutions for Dairy Products, Rural Sustainability researched by testing three biodegradable materials (PLA containers, silicon-oxide-coated PLA, and polyolefin shrink film) across five real dairy products, tracking pH, moisture, and microbial growth over time. The key finding was that no single material performed well across all products — silicon-oxide-coated PLA offered the best overall barrier performance but was still not edible and fell short of matching conventional packaging in some cases. This directly supports this paper's argument that sustainable alternatives involve genuine performance trade-offs and that dairy packaging requires a differentiated, product-specific strategy rather than one universal material. The study also noted low consumer awareness and cost barriers, reinforcing the implementation challenges discussed elsewhere in this research. Ellen MacArthur Foundation (2023): The New Plastics Economy. This report shifts the focus toward the bigger picture — the idea of a circular economy, where packaging isn't just thrown away but reused, recycled, or redesigned to stay in circulation longer. It's directly relevant to this study's discussion of refill systems and returnable glass bottles, and it helped shape the idea that sustainable packaging isn't just about picking a "better material," but rethinking the whole system around how packaging is used and reused. International Dairy Federation (2022): Packaging Innovation and Sustainability in the Global Dairy Sector. Unlike more general packaging literature, this source looks specifically at dairy, making it one of the more directly useful references for this study. It highlights the unique challenges dairy products face — spoilage risk, cold-chain requirements, and the difficulty of recycling multilayer cartons — and reinforces the idea that solutions developed for other food categories don't always transfer well to dairy. World Economic Forum (2022): The Global Plastics Outlook and Corporate ESG Commitments. This source connects the dots between plastic pollution as a global issue and how individual companies are expected to respond through their ESG strategies. It was particularly useful for understanding the "why now" behind corporate packaging commitments — essentially, why plastic packaging shifted from being a purely operational decision to something boards and investors actively track and scrutinize.

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Research Problem:

Dairy companies want to cut down on plastic, but it's not that simple. Plastic keeps products safe and fresh, yet it's hard to recycle — especially pouches and cartons. The alternatives, like bioplastics, edible films, glass, and reuse systems, each come with their own problems: some cost more, some don't protect the product as well, and some lack the recycling systems in place to work properly. On top of that, the people who study packaging materials and the people who study ESG reporting don't really talk to each other, so there's no clear guide connecting the two. That leaves companies trying to balance food safety, cost, rules, and environmental impact on their own, all while proving to investors and customers that they're actually being sustainable. This study aims to make sense of that balancing act and help companies handle it with more clarity and confidence.

Research Objectives:

1. To examine the drivers behind the demand for sustainable alternatives to plastic packaging in the dairy industry.
2. To develop a sustainable packaging alternatives.
3. To identify and evaluate the principal sustainable packaging alternatives available to dairy producers.
4. To identify the key implementation challenges for adoption of sustainable packaging alternatives in the dairy sector.
5. To propose recommendations for integrating sustainable packaging with dairy products.

Research Methodology:

The present research is descriptive and exploratory in nature. The study primarily aims to understand and describe the existing practices, trends, challenges, and developments in the dairy industry. The research is based entirely on secondary data collected from reliable and authentic sources such as newspapers, research journals, magazines, books, industry reports, government publications, and credible websites. For a comprehensive understanding of the subject, a case study approach has been adopted. Selected dairy companies are studied to examine their business practices, products, marketing strategies, innovations, sustainability initiatives, and other relevant aspects of their operations. The information collected from various secondary sources is analysed and compared to identify significant trends, similarities, differences, and emerging practices within the dairy sector. The findings of the study are therefore based on the systematic review and interpretation of existing information available from these sources.

ESG Integration:

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Building on the sustainability dimensions above, this section examines how packaging decisions map onto the specific Environmental, Social, and Governance (ESG) pillars used in corporate reporting and investment analysis.

1) Environmental (E) Integration

- Reduction of virgin plastic use and overall packaging material intensity.
- Increased recyclability, recycled content, and compostability across packaging formats.
- Lifecycle carbon footprint associated with packaging production, transport, and disposal.
- Contribution to circular economy targets, including reuse and refill infrastructure development.

2) Social (S) Integration

- Food safety and consumer health implications of new or substituted packaging materials.
- Affordability and accessibility impacts of packaging cost premiums on end consumers.
- Labour and community conditions within fibre, bioplastic, or glass supply chains.
- Consumer communication and education regarding correct disposal and recycling practices.

3) Governance (G) Integration

- Compliance with evolving packaging regulations, including extended producer responsibility (EPR) schemes and single-use plastic restrictions.
- Accuracy and verifiability of sustainability claims made on packaging and in marketing communications.
- Supply chain due diligence for packaging material sourcing and supplier certification.
- Board-level oversight and integration of packaging targets into formal ESG reporting and executive accountability structures.

Packaging Alternatives:

1. Returnable Glass Bottle System

Milk is sold in sterilized glass bottles, and customers pay a small deposit that's refunded when they return the empty bottle for washing, sterilizing, and reuse. It's about as close to zero-waste as dairy packaging gets — fully recyclable, doesn't leach chemicals into the milk, and actually preserves taste better than plastic. The catch is that glass is heavy (which adds to transport costs and emissions), it can break, and setting up the collection-and-sterilization loop requires real infrastructure and upfront investment.

2. Milk Refill Stations (Bulk Dispensing)

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Here, customers bring their own container and fill it up at an automated dispensing machine — similar to how bulk grains or detergent are sold in some stores. It cuts packaging waste to almost nothing and works well in supermarkets or dairy outlets with steady foot traffic. The downside is it needs space, regular cleaning, and it only works if people are actually willing to bring their own containers — so it depends heavily on consumer habits changing.

3. Doorstep Delivery in Glass Bottles

This is the classic milkman model — glass bottles delivered to your door, then picked up empty on the next round and reused. It's convenient for consumers and builds a genuine reuse habit over time. But it only works with efficient delivery logistics, and bottles can still break in transit, which adds handling costs.

4. Stainless Steel Milk Containers

Used mainly for bulk transport — large steel cans move milk from dairy to shop, where it's sold by refill. Steel is durable, leak-proof, and fully recyclable, making it a strong option for high-volume handling. It's not practical for small, individual servings, though, and it needs proper cleaning protocols and a higher initial investment.

5. Alternative Sustainable Packaging (Plant-Based Cartons)

For long-distance distribution where glass isn't practical, paper-based cartons with recyclable or bio-based coatings step in. They're lightweight, less prone to breaking than glass, and reasonably recyclable or biodegradable — a good fit for markets glass can't reach. The trade- offs are a higher cost than plastic, limited availability in some regions, and they're simply not as reusable as glass.

Case Study: Mother Dairy's Naturally Degradable Milk Pouch

Mother Dairy, one of India's leading dairy brands, introduced what it describes as India's first naturally degradable milk pouch to address the environmental concerns associated with conventional plastic packaging. The pouch uses special additive technology that enables it to degrade naturally under suitable environmental conditions and carries RDK (Reduce, Degrade, Know) certification to support its sustainability claim. Branded around the message "good for you, good for the planet," the innovation aims to combine environmental responsibility with consumer safety and convenience. Importantly, Mother Dairy states that the pouch maintains the required quality, safety, shelf life, and food-contact standards of conventional milk packaging, demonstrating an effort to reduce environmental impact without compromising packaging performance.

Relevance to Corporate Sustainability and ESG Strategy:

This case illustrates several points relevant to the broader research on sustainable dairy packaging:

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- **Environmental (E):** A direct, tangible reduction in long-term plastic persistence, addressing one of the sector's most visible environmental liabilities — flexible plastic pouches, which are notoriously difficult to recycle through municipal systems.
- **Social (S):** By maintaining food safety and shelf life, the innovation avoids shifting sustainability costs onto consumers in the form of reduced product quality or higher spoilage risk — an important consideration given dairy's affordability sensitivity.
- **Governance (G):** The RDK certification adds a layer of third-party validation, which matters for credibility — it helps guard against greenwashing concerns that often accompany "eco- friendly" packaging claims in the food industry.

Conclusion:

The study examined the challenges faced by dairy companies in reducing their dependence on plastic packaging and adopting more sustainable alternatives. Plastic remains widely used because it is economical, lightweight, durable, and effective in protecting dairy products from contamination. It is also compatible with high-speed filling, storage, and distribution systems. However, its extensive use creates environmental concerns, as most dairy plastic packaging is single-use and difficult to recycle. The study found that alternative materials also involve certain limitations and trade-offs. Bioplastics and edible films may be costly or have performance limitations, while glass and reusable systems require significant infrastructure and reverse-logistics arrangements. The analysis considered packaging decisions from three dimensions—technical performance, sustainability impact, and ESG strategy. It was observed that no single packaging solution is suitable for all situations. Glass and refill systems may be appropriate for local distribution, steel for bulk transportation, and plant-based cartons for long- distance delivery. Packaging choices should be aligned with operational requirements, environmental objectives, and stakeholder expectations.

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(ISSN – 2581-5830)
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ESG DISCLOSURE ANALYSIS BASED ON BRSR REPORT FY 2024–25: A COMPARATIVE STUDY OF CIPLA LTD. AND SUN PHARMACEUTICAL INDUSTRIES LTD.

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Abstract:
This study critically compares the Environmental, Social and Governance (ESG) disclosure and performance of Cipla Ltd. and Sun Pharmaceutical Industries Ltd. for FY 2024–25, with emphasis on their Business Responsibility and Sustainability Report (BRSR), annual report and sustainability disclosures. The pharmaceutical sector has a significant ESG footprint because its operations involve energy and water consumption, chemical processes, waste generation, employee safety, patient access and strict regulatory obligations. The analysis therefore examines environmental indicators such as emissions, renewable energy, water and waste; social indicators such as gender diversity, CSR, healthcare access and community impact; and governance indicators such as board independence, ethics, compliance, risk management and assurance. The findings show that both companies demonstrate mature ESG practices, but their relative strengths differ.

Introduction:

Environmental, Social and Governance (ESG) reporting has become an important mechanism for evaluating how companies create long-term value while managing environmental and social risks. In India, the BRSR framework provides a structured basis for companies to disclose their performance on responsible business principles. For pharmaceutical companies, ESG is especially relevant because manufacturing can require substantial energy and water, generate hazardous and non-hazardous waste, and involve complex supply chains. At the same time, pharmaceutical companies have a direct social responsibility to improve access to medicines, maintain product quality, protect employees and support communities.

Cipla Ltd. and Sun Pharmaceutical Industries Ltd. are two major Indian pharmaceutical companies with extensive domestic and international operations. Their FY 2024–25 disclosures provide useful evidence for a comparative assessment. This paper evaluates their ESG performance across the three pillars and identifies areas of relative strength. The comparison is descriptive and analytical rather than a universal ranking, because the companies use different baselines and reporting boundaries for several environmental indicators.

Objectives and Methodology:

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The objectives are to: (i) examine the major ESG disclosures of Cipla and Sun Pharma for FY 2024–25; (ii) compare their environmental, social and governance practices; (iii) identify areas in which one company shows a relative advantage; and (iv) assess the broader relevance of ESG disclosure to responsible pharmaceutical business. The study uses secondary data from the companies' FY 2024–25 annual reports, BRSR/sustainability disclosures and ESG supplementary information. The analysis focuses on comparable indicators such as emissions, renewable energy, water, waste, women employees, CSR, healthcare access, board independence, ethics and assurance. Because the reporting boundaries differ, percentages are interpreted in the context of each company's stated baseline rather than treated as perfectly like-for-like measures.

Environmental Performance:

Sun Pharma reports meaningful progress in reducing its environmental footprint. Its FY 2024–25 disclosures indicate a reduction in absolute Scope 1 and Scope 2 emissions compared with its 2020 baseline, together with a substantial improvement in emissions intensity. Water consumption and water intensity have also declined, and 41% of energy was reported as coming from renewable sources. The company has additionally communicated a long-term Net Zero emissions ambition for 2050. Environmental, Health and Safety (EHS) systems, waste reduction, recycling and resource-efficiency initiatives form part of its operational approach.

Cipla demonstrates particularly strong operational environmental outcomes in its Indian manufacturing operations. Its FY 2024–25 disclosures report a 58% reduction in Scope 1 and Scope 2 emissions against the FY 2019–20 baseline, 64% renewable electricity use across India manufacturing operations and a water-positive position of approximately 1.75 times the water withdrawn. Cipla also reported Zero Waste to landfill.

Environmental indicator	**Sun Pharma**	**Cipla**
Renewable energy	41% of energy from renewable sources	64% renewable electricity in India manufacturing operations
Scope 1 & 2 emissions	Reduced versus 2020 baseline	58% reduction versus FY2019–20 India manufacturing baseline
Water	25% lower absolute consumption vs 2020 baseline	About 1.75× water positive
Waste	Recycling, reuse and recovery initiatives	Zero Waste to Landfill across Indian manufacturing operations

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Social Performance:

The social pillar is central to pharmaceutical ESG because company performance directly affects patients, employees and communities. Sun Pharma reported CSR spending of approximately ₹1,424 million in FY 2024–25 and stated that its CSR initiatives reached more than one million people in India. Its programmes cover healthcare, education, livelihoods, drinking water, sanitation and community development. The company also reported 6,978 new hires and 18.59% gender diversity in its workforce.

Cipla reported more than 338,000 people impacted through social-impact initiatives in FY 2024–25. Its programmes include palliative care, primary and community healthcare, patient support, education and skilling, environmental activities and disaster relief. Around 57,000 patients were served through palliative-care partnerships, while the BreatheFree Programme reached or counselled about 4.5 million patients. Cipla also reported more than 100,000 employee volunteering hours and continued recognition as a Great Place to Work. Women represented about 15.87% of the permanent workforce, with women also accounting for 17.01% of top-management positions.

The comparison indicates different forms of social strength. Sun Pharma has a higher reported overall female workforce share and a larger disclosed CSR spending and reach figure. Cipla, however, provides strong evidence of patient-centred social impact through palliative care, respiratory-health counselling and community programmes. Both companies address human rights, workplace safety, inclusion and responsible employment, making social performance a common area of strength.

Governance Performance:

Governance determines whether ESG commitments are supported by accountability, ethical conduct and effective oversight. Sun Pharma's governance framework includes Board oversight, committees, policies and a Global Code of Conduct. In FY 2024–25, average Board meeting attendance was reported at 92.9%, and independent directors represented 62.5% of the Board as of March 31, 2025. Its governance approach also covers anti-bribery, whistleblower mechanisms, compliance, risk management, stakeholder engagement and grievance processes. These disclosures indicate a structured approach to ethical and accountable business conduct.

Cipla also maintains Board-level ESG oversight supported by management structures and formal sustainability responsibilities. Its governance priorities include ethics, compliance, responsible procurement, data and information security, product quality, stakeholder accountability and supplier engagement. A significant strength is the

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external assurance of FY25 non-financial performance by DNV Business Assurance India under ISAE 3000 (revised), as reported in its ESG supplementary disclosure. ESG-related risks are incorporated into enterprise risk-management thinking, supporting the integration of sustainability with business decision-making.

Comparative Discussion:

ESG area	Sun Pharma	Cipla	Relative strength
Environment	Renewable energy, carbon/water reductions; Net Zero 2050 ambition.	Renewable electricity, 58% Scope 1–2 reduction, water positivity and ZWTL.	Cipla on selected FY25 operational outcomes
Women employees	18.59% reported workforce share; 30% target by 2040.	15.87% permanent workforce; 17.01% top management.	Sun Pharma
CSR & healthcare	₹1,424 million CSR; 1M+ lives reached in India.	338,000+ impacted; palliative care and 4.5M BreatheFree reach/counselling.	Both strong; different emphasis
Governance	62.5% independent directors; strong ethics/compliance framework.	55% independent directors; external assurance and ESG governance.	Both strong; different strengths

Key Findings:

First, Cipla appears stronger on several FY25 environmental outcome indicators, particularly renewable electricity, water positivity, emissions reduction within its stated India-manufacturing boundary and Zero Waste to Landfill. Second, Sun Pharma demonstrates strong resource-efficiency improvements and has a clearly communicated Net Zero 2050 ambition. Third, Sun Pharma reports a higher female workforce share and substantial CSR spending and reach, while Cipla demonstrates strong patient and community impact through palliative care, respiratory-health programmes and healthcare initiatives. Fourth, governance is a common strength, with both companies using Board oversight, ethics and compliance systems, risk management and stakeholder mechanisms. Cipla's explicit external assurance adds another dimension of reporting credibility. Finally, the comparison shows that ESG leadership is multidimensional and should not be reduced to a single percentage or ranking.

Conclusion:

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The FY 2024–25 comparison of Cipla and Sun Pharma demonstrates that both companies have incorporated ESG into their business and sustainability strategies. Cipla stands out for selected environmental outcomes such as renewable electricity, water positivity and Zero Waste to Landfill, together with strong patient and community programmes. Sun Pharma stands out for its reported female workforce representation, CSR scale, board independence and long-term Net Zero 2050 ambition. Governance and ethical business conduct remain important common strengths.

The fairest conclusion is therefore not that one company is universally superior. Instead, each company performs better on particular dimensions, and the interpretation of reported percentages must consider the different baselines and reporting boundaries used in their disclosures. For the Indian pharmaceutical industry, the study highlights that effective ESG performance requires environmental efficiency, patient access, employee wellbeing, community development, ethical conduct and transparent accountability to be addressed together.

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A GLOBAL JOURNAL OF SOCIAL SCIENCES
(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
Globally peer-reviewed and open access journal.

GREEN BANKING PRACTICES OF INDIAN BANKS: SBI, HDFC, ICICI CASE STUDY

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Abstract:
Green Banking means using banking services and practices that help protect the environment and promote sustainable development. It encourages banks to reduce paper usage, save energy, support.
This study focuses on the green banking practices of three leading Indian banks—State Bank of India (SBI), HDFC Bank, and ICICI Bank. It aims to understand the different initiatives taken by these banks, such as online and mobile banking, paperless transactions, green loans, renewable energy financing, energy-efficient branches, and tree plantation and CSR activities. The study also compares the efforts of these banks to see how they contribute towards environmental protection while providing quality banking services.

Introduction:
The Government of India has also played an important role in encouraging Green Banking through initiatives such as Digital India (2015), the Smart Cities Mission (2015), the National Solar Mission, and the promotion of digital payments through UPI. These initiatives have encouraged banks to reduce paper- based transactions, improve digital banking services, and support renewable energy and sustainable development.
HDFC Bank was incorporated on 30 August 1994 and started its banking operations in January 1995. It is one of India's leading private sector banks. HDFC Bank has introduced several Green Banking initiatives such as digital account opening, internet banking, mobile banking, cashless transactions etc.
ICICI Bank was established in 1994 and has become one of India's most trusted private sector banks.
The bank strongly promotes digital banking through internet banking, iMobile, UPI payments, and other.

Research Methodology:

Secondary Data
For this project, secondary data has been collected from reliable and authentic sources such as the annual reports, Business Responsibility and Sustainability Reports (BRSR), and Sustainability Reports of State Bank of India (SBI), HDFC Bank,

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and ICICI Bank. Additional information has been obtained from the official websites of these banks, Reserve Bank of India (RBI) publications,

Objective of the Study:

1. To understand the concept and importance of Green Banking.
2. To study the Green Banking practices adopted by SBI, HDFC Bank and ICICI Bank.
3. To compare the Green Banking initiatives of SBI, HDFC Bank and ICICI Bank.
4. To analyse the role of Green Banking in environmental protection and sustainable development.
5. To identify the benefits and challenges of Green Banking in India

Limitation:

1. To understand the concept of Green Banking.
2. To study the Green Banking practices of SBI, HDFC Bank, and ICICI Bank.
3. To compare the Green Banking initiatives of the selected banks.
4. To analyse the role of Green Banking in environmental protection.
5. To examine the impact of digital banking on Green Banking.

Review of Literature:

Green Banking means adopting banking practices that reduce the negative impact of banking activities on the environment. It includes paperless banking, digital transactions, energy-efficient branches, renewable-energy financing, green loans, sustainable investments and responsible lending.

STATE BANK OF INDIA – GREEN BANKING PRACTICES

State Bank of India (SBI) is India's largest public-sector bank. Because of its very large branch network and customer base, its Green Banking activities can have a significant environmental impact.

SBI's sustainability reporting is available for several years, including **2021–22, 2022–23, 2023–24, 2024–25 and 2025–26**, which makes it possible to study the development of its environmental practices over time.

Major Green Banking Practices of SBI

A. Green Financing

SBI has increasingly focused on financing renewable energy and environmentally responsible projects. Its FY2024–25 report states that the bank aims for a **7.5% green portfolio by 2030**. It also reported green bonds, green deposits and financing support for sustainable activities.

B. Renewable Energy

SBI has invested in solar power and renewable-energy initiatives. In FY2024–25, it reported **more than 31 MW of installed solar capacity**.

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C. Green Deposits

SBI has also introduced green deposits, where funds can support environmentally beneficial activities. In FY2024–25, SBI reported **₹128.31 crore raised through Green Deposits for EV loans**.

D. Rainwater Harvesting

SBI has adopted rainwater-harvesting systems as part of its environmental management. In FY2024–25, it reported **542 rainwater-harvesting systems**.

HDFC BANK – GREEN BANKING PRACTICES

HDFC Bank is one of India's leading private-sector banks. Its Green Banking approach mainly combines digital banking, energy efficiency, renewable energy, green buildings and sustainable finance.

HDFC Bank's official reports are available for FY2021–22, FY2022–23, FY2023–24 and FY2024–25.

A. Paperless Banking

HDFC Bank has promoted paperless banking through NetBanking, PhoneBanking and MobileBanking. Its CSR information states that paperless ATM services and digital channels help reduce paper use and emissions associated with customer travel.

B. Solar Energy

In FY2021–22, HDFC Bank reported **238.5 kWp** of cumulative rooftop solar capacity. It also used green power in selected branches.

By FY2023–24, HDFC Bank reported **10,052 MW** of cumulative renewable-energy capacity financed and **3,270 MWh** of green power consumed during FY2024. It also reported more than **2,026 IGBC-certified branches** as of March 31, 2024.

C. Renewable Energy Financing

HDFC Bank has supported renewable-energy projects through financing. In FY2022–23, it reported a cumulative underwritten amount of **₹15,115 crore** towards renewable-energy financing.

D. Energy Management

The bank has used technology to monitor and reduce electricity consumption. In FY2024–25, HDFC Bank reported:

- **743 kWp** cumulative solar power generation capacity commissioned
- **350 branches** with automated energy-management systems
- **623.84 MWh** of electricity saved through those systems
- **19 premises** transitioned to 100% green power
- **17,616.90 MWh** of units saved through the green-power transition

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(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
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ICICI BANK – GREEN BANKING PRACTICES

ICICI Bank has adopted a broader ESG-based approach towards Green Banking. Its sustainability activities include sustainable financing, renewable energy, electric vehicles, green buildings, water conservation, waste management and energy efficiency.

ICICI Bank's official annual reports and ESG reports are available year-wise, including FY2023, FY2024 and FY2025.

A. Sustainable Financing

ICICI Bank's sustainable-financing portfolio has grown significantly.

At **March 31, 2024**, the bank reported:

- Sustainable financing portfolio: **₹685.28 billion**
- Green financing portfolio: **₹193.66 billion**
- Around **50%** of green financing was related to renewable energy.

At **March 31, 2025**, the sustainable-financing portfolio increased to **₹906.24 billion**, while green financing increased to **₹310.10 billion**.

B. Renewable Energy

ICICI Bank finances solar, wind, hybrid and waste-to-energy projects. In FY2025, its green-financing portfolio supported renewable-energy generation projects associated with approximately **1.83 GW** of installed capacity.

C. Electric Vehicles

ICICI Bank's green financing includes loans for electric vehicles in both retail and corporate segments. It also finances manufacturers involved in electric-vehicle production and related technologies.

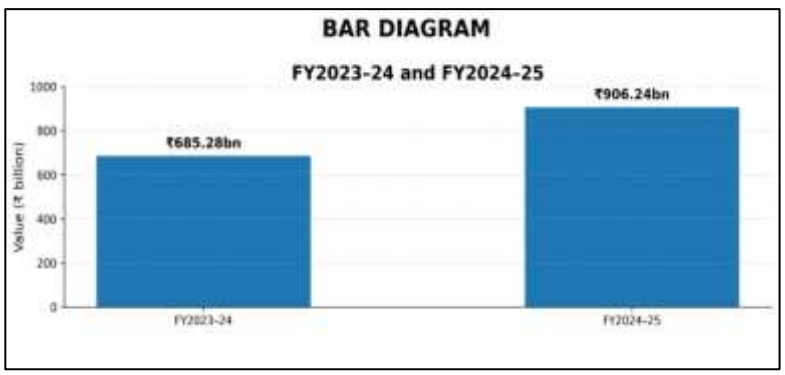
D. Green Buildings

The bank also supports buildings certified under standards such as IGBC and LEED.

E. Renewable Electricity

In FY2025, **38% of ICICI Bank's total electricity consumption** came from renewable sources when including IRECs. The bank has a target to become carbon neutral for Scope 1 and Scope 2 emissions by **fiscal 2032**.

CHART 3 – ICICI BANK SUSTAINABLE FINANCING



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Comparison of Green Banking Practices:

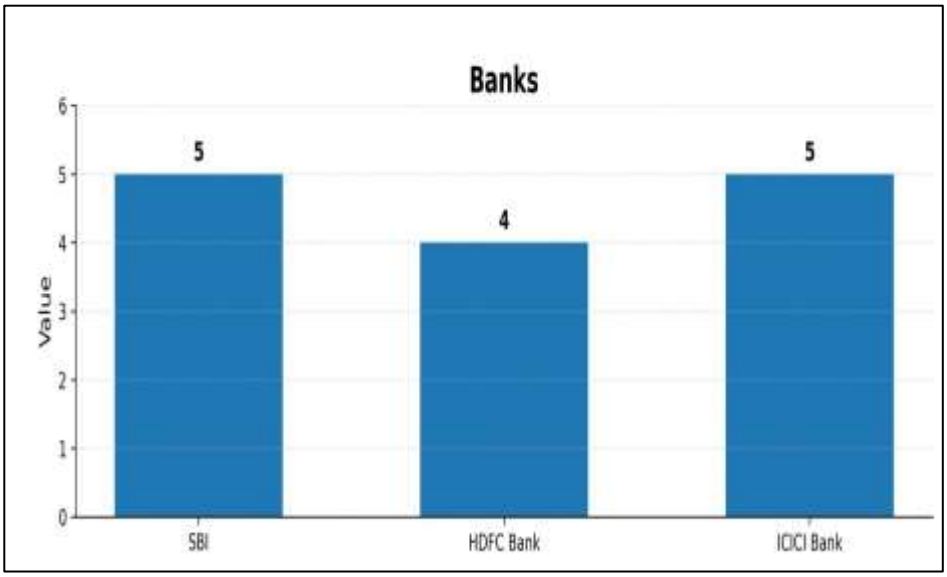
The three banks have adopted Green Banking, but their main areas of focus are different.

SBI has a strong focus on **green financing, renewable energy and environmental infrastructure**. Its 2030 green-portfolio target and large-scale financing initiatives show that it is trying to increase the environmental component of its lending portfolio.

HDFC Bank has a strong focus on **digital banking, energy efficiency, green buildings and renewableenergy financing**. Its use of automated energy-management systems and solar installations shows its focus on reducing the environmental impact of its own operations.

ICICI Bank follows a more clearly structured **ESG and sustainable-finance approach**. Its green financing portfolio, renewable-energy financing, EV financing and carbon-neutrality target are important parts of its strategy.

CHART 4 – GREEN BANKING FOCUS



Major Green Banking Activities:

The major Green Banking activities found across the three banks are:

1. Digital banking
2. Paperless transactions
3. Mobile banking
4. Internet banking
5. Electronic statements
6. Green loans
7. Renewable-energy financing
8. Electric-vehicle financing

Overall Comparison :

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Particular	SBI	HDFC Bank	ICICI Bank
Bank type	Public sector	Private sector	Private sector
Established	1955	1994	1994
Digital banking	Strong	Strong	Strong
Paperless banking	Yes	Yes	Yes
Green finance	Major focus	Strong	Major focus
Renewable-energy financing	Yes	Yes	Yes
Solar initiatives	Strong	Yes	Yes
Green deposits	Yes	Sustainability initiatives	Sustainable-finance framework
EV financing	Yes	Yes	Yes
Green buildings	Yes	Strong	Yes
ESG framework	Strong	Strong	Strong
Carbon-neutrality target	Internal operations by 2030	FY2032	FY2032
Major strength	Green finance	Energy & digital operations	ESG & sustainable finance

Findings of the Case Study :

Based on the available data, the following findings can be made:

1. All three banks have adopted Green Banking practices.
2. Digital banking is an important Green Banking activity across SBI, HDFC Bank and ICICI Bank.
3. SBI has developed a strong focus on green advances and green finance.
4. HDFC Bank has placed considerable emphasis on energy efficiency, solar power, green buildings and digital banking
5. ICICI Bank has developed a strong sustainable-financing and ESG framework
6. Green financing has increased in importance, especially in renewable energy, electric vehicles and sustainable infrastructure.
7. The banks are increasingly setting measurable environmental targets rather than relying only on general sustainability statements.

Conclusion of the Case Study :

The case study of SBI, HDFC Bank and ICICI Bank shows that Green Banking has become an important part of the Indian banking sector. All three banks are using technology and sustainable financial practices to reduce their environmental impact. SBI has shown strong progress in green financing, renewable energy and green advances. HDFC Bank has focused considerably on digital banking, energy efficiency,

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solar power and green buildings. ICICI Bank has developed a strong ESG framework and has significantly increased its sustainable and green-financing portfolio.

Conclusion:

This study focused on the **Green Banking Practices of State Bank of India (SBI), HDFC Bank and ICICI Bank**. The study shows that all three banks are making efforts to make their banking operations more environmentally friendly. They have adopted digital banking services such as internet banking, mobile banking, UPI, online transactions and e-statements. These services have reduced the need for paper documents and frequent visits to bank branches, making banking easier for customers as well as better for the environment.

SBI has taken several important steps towards Green Banking, especially in the areas of green finance, renewable energy and environmental management. The bank supports renewable-energy projects and has introduced initiatives such as green deposits, solar power and rainwater harvesting. SBI has also set targets for increasing its green portfolio, showing its commitment towards sustainable finance.

HDFC Bank has focused strongly on digital and paperless banking along with energy efficiency and renewable energy. The bank has adopted solar power, energy-management systems and green buildings. It also provides financial support to renewable-energy projects. These initiatives show that HDFC Bank is trying to reduce the environmental impact of its own operations while also supporting sustainable economic activities.

ICICI Bank has adopted a broader approach through its ESG and sustainable-finance initiatives. The bank provides finance for renewable energy, electric vehicles and other environmentally responsible activities. It also focuses on energy conservation, waste management and the use of renewable electricity. Its long-term environmental targets show that sustainability has become an important part of its overall business strategy.

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(ISSN – 2581-5830)
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IMPACT OF SOCIAL MEDIA ON PROMOTING GREEN GANESH UTSAV - A STUDY OF INSTAGRAM AND YOUTUBE IN MUMBAI'S WESTERN SUBURBS

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Abstract:
Mumbai's Ganesh Utsav is all about devotion and togetherness, but every year the celebration leaves behind a big environmental cost. Idols made of Plaster of Paris and decorations made of plastic and thermocol pollute our beaches and seas during visarjan. To solve this, many people are now moving towards Green Ganesh Utsav - using Shadu clay idols, natural colours, paper mache and even seed-Ganesh idols that grow into a plant. This study looks at how social media is helping this change, especially Instagram and YouTube. In areas like Kandivali, Borivali, Andheri and Goregaon, young people and Mandal organizers are getting most of their festive ideas online. Reels, Shorts, influencer videos and NGO campaigns are now teaching people about eco-friendly options. For this research, we spoke to 60 people - 50 devotees and youth and 10 idol makers and researcher also studied Instagram posts with #EcoFriendlyGanesh and #GreenGanesh and YouTube videos
Keywords: *Green Ganesh Utsav, Eco-friendly Ganesha, Social Media, Instagram, YouTube, Shadu clay idols, natural colours, paper mache and seed-Ganesha.*

Introduction

Ganesh Chaturthi in Maharashtra is celebrated with immense devotion, but it is also closely connected to the cultural economy of the state. In Mumbai alone, more than 1.5 lakh Ganesh idols are immersed every year. While the festival brings together artisans, decorators, small businesses, self-help groups, and consumers, the environmental impact of visarjan has become an increasing concern. A report by the Maharashtra Pollution Control Board (MPCB) has highlighted concerns regarding changes in water quality, including increased acidity and heavy-metal concentrations following idol immersion.

To address these concerns, the Brihanmumbai Municipal Corporation (BMC) has encouraged the use of artificial immersion ponds and promoted eco-friendly idols. At the same time, a digital movement around sustainable Ganesh Utsav is gaining momentum. Content creators, NGOs such as Beach Warriors, and women's self-help groups associated with MAVIM and Tata Power's Anokha Dhaaga are using Instagram and YouTube to promote environmentally friendly alternatives. These include Shadu-

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mitti idols, crochet torans, Haldi-Kumkum rangolis, reusable decorations, and Nirmalya composting.

Role of YouTube and Instagram:

In 2025, BMC used an external social-media agency to create reels, posters, interviews and comics promoting environmentally responsible Ganesh celebrations. During the same festival, immersion in artificial lakes increased by **98%** with approximately **1.84 lakh idols** immersed in artificial lakes. The increase cannot be attributed to social media alone because BMC also implemented other measures, but it provides a strong example of how digital awareness can form part of a broader behavior change campaign.

Instagram is particularly useful because Reels, Stories, posts and influencer content can present Green Ganesh practices in an attractive and easy-to-understand way. An Instagram Reel could show: "POP Idol vs. Shadu Clay Idol – What Happens After Visarjan?" The Reel could visually show the environmental consequences of POP and then demonstrate a clay idol dissolving naturally. This type of content can influence the consumer journey:

Instagram Reel → Awareness → Understanding environmental problem → Positive attitude → Intention to buy eco-friendly idol → Actual purchase

Problem Statement:

Ganesh Chaturthi is celebrated on a large scale in Mumbai, with 1,97,114 idols immersed in 2025. Around 1,982 metric tonnes of POP leftovers were collected after the festival. Despite growing awareness about eco-friendly idols and immersion, many people continue to choose traditional options due to cost, convenience, availability, and customs. Social media platforms like Instagram and YouTube are promoting sustainable celebrations, but it is unclear whether this awareness leads to actual behavioural change.

Research Gap:

Existing studies have examined **Green Ganesh Utsav, environmental awareness, green consumer behaviour and social media separately.** However, limited research specifically examines **Instagram and YouTube as tools for promoting Green Ganesh Utsav and whether social-media awareness translates into actual adoption of eco-friendly practices in Mumbai's Western Suburbs.** The present study attempts to address this gap.

Need of the Study:

The study aims to understand the awareness and adoption of eco-friendly Ganesh Utsav practices and examine the influence of Instagram and YouTube on people's choices. It will also identify the main barriers to sustainable practices and explore ways to encourage more environmentally friendly celebrations.

Review of Literature:

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Borhade (2011) studied the environmental impact of Ganesh festivals and highlighted pollution caused by Plaster of Paris idols and immersion activities. The study emphasized the need for eco-friendly celebration practices.

Taufique and Vaithianathan (2018) examined green consumer behaviour among young Indian consumers. The study found that environmental attitudes and awareness influence consumers' intentions toward environmentally responsible behaviour.

Gupta and Syed (2022) examined the role of social media in influencing green behaviour among Indian consumers. The study found that social media interaction, trust, trends and electronic word-of-mouth can increase environmental concern and influence green attitudes.

Benaim (2023) examined the emergence of Green Ganesh Chaturthi in Mumbai and Chennai. The study highlighted the growing use of biodegradable idols and environmentally friendly practices and noted the importance of awareness in encouraging sustainable celebrations.

Tazeen and Mullick (2023) studied the influence of Facebook and Instagram on green-product purchasing behaviour. The findings indicated that social media can influence consumer awareness and attitudes toward environmentally friendly products.

Kumar and Pandey (2023) investigated social media and green consumption behaviour. Their findings showed that social media, electronic word-of-mouth and social norms can contribute to environmentally responsible consumption.

Chan and Jamaleddine (2024) examined an Instagram-based sustainability campaign and found that social-media campaigns can improve environmental knowledge and strengthen intentions to undertake sustainable behaviours.

Vaja (2025) examined the impact of social media on interpersonal relationships. The study highlights that social media has significantly changed the way individuals communicate and maintain relationships. While platforms such as Instagram, Facebook, and WhatsApp help people stay connected and facilitate quick communication, excessive use may reduce face-to-face interaction and affect the quality of personal relationships.

Bharti et al. (2025) examined green marketing and consumer behavioural intentions in India. The study found that green promotion and environmental attitudes play an important role in encouraging consumers toward sustainable products.

Vaja (2026) studied eco-friendly Ganesh festivals in Maharashtra from an **ESG and sustainability perspective.** It emphasized that greater environmental awareness can encourage people to adopt sustainable festival practices. However, the study did not specifically examine the role of **Instagram and YouTube** in promoting Green

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Ganesh Utsav. The study focuses on how social media awareness may influence the adoption of eco-friendly Ganesh Utsav practices in Mumbai's Western Suburbs.

Objectives:

1. To measure the awareness of eco-friendly Ganesh Utsav practices.
2. To study the influence of Instagram and YouTube on sustainable festival practices.
3. To assess whether social media awareness leads to actual adoption of eco-friendly practices.

Research Methodology:

- Research Design - The study adopts a **descriptive and analytical research design**.
- Research Approach - A **quantitative research approach** is adopted. Primary data will be collected through a structured questionnaire from respondents residing in Mumbai's Western Suburbs.
- Area of the Study - The study is restricted to the **Western Suburbs of Mumbai**.
- Population - The population of the study consists of individuals who participate in or are familiar with Ganesh Utsav and use social-media platforms, particularly Instagram and/or YouTube.
- Sample Size – 53 Respondents
- Sources of Data -***a. Primary Data:*** Primary data iscollected through a structured questionnaire distributed using Google Forms.
- **Secondary Data:** Secondary information is collected from research articles, journals, books, government publications, reports, websites, and other relevant sources dealing with social media, environmental sustainability, consumer behaviour, and Green Ganesh Utsav.

Research Hypothesis:

1.	**H_0:** There is no significant relationship between social media exposure and awareness of eco-friendly Ganesh Utsav practices.	**H_1:** There is a significant relationship between social media exposure and awareness of eco-friendly Ganesh Utsav practices
2.	**H_0:** There is no significant relationship between social media awareness and adoption of eco-friendly Ganesh Utsav practices.	**H_1:** There is a significant relationship between social media awareness and adoption of eco-friendly Ganesh Utsav practices.

Limitations of the Study:

1. The study is geographically restricted to Mumbai's Western Suburbs.
2. Convenience sampling may limit the generalisation of findings.
3. The study relies primarily on respondents' self-reported responses.

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4. Social-media trends and algorithms change rapidly, which may influence exposure to environmental content.
5. The study focuses specifically on Instagram and YouTube and does not examine other platforms in detail.

Data Analysis:

Table 1. Demographic profile of the Respondents

Demographic Variable	Category	Frequency	Percentage (%)
Age	18–25 years	45	84.91
	26–35 years	4	7.55
	36–45 years	3	5.66
	46–55 years	1	1.89
Total		**53**	**100.00**
Gender	Male	37	69.81
	Female	16	30.19
Total		**53**	**100.00**

Interpretation - The demographic profile shows that the majority of respondents **84.91%** belong to the **18–25 years** age group. Male respondents constitute **69.81%**, while females account for **30.19%**.

Table 2. Awareness of Eco-Friendly Ganesh Idols

Response	Frequency	Percentage
Yes	50	94.34%
No	3	5.66%
Total	**53**	**100%**

Interpretation: The majority **94.34%** of respondents have heard about eco-friendly Ganesh idols, indicating a very high level of basic awareness.

Table 3. Frequency of Seeing Eco-Friendly Ganesh Content

Frequency	Frequency of Respondents	Percentage
Frequently	21	39.62%
Sometimes	25	47.17%
Rarely	5	9.43%
Never	1	1.89%
No Response	1	1.89%
Total	**53**	**100%**

Interpretation: Most respondents are exposed to eco-friendly Ganesh content through Instagram or YouTube. **86.79%** see such content either frequently or sometimes.

Table 4. Preferred Social Media Platform

Platform	Frequency	Percentage

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Instagram	29	54.72%
Both Instagram & YouTube	17	32.08%
YouTube	4	7.55%
Neither	2	3.77%
No Response	1	1.89%
Total	**53**	**100%**

Interpretation: Instagram is the most commonly used platform for Ganesh Chaturthi-related content, followed by respondents who use both Instagram and YouTube.

Table 5. Consideration After Seeing Social Media Content

Response	Frequency	Percentage
Yes	39	73.58%
Maybe	10	18.87%
No	2	3.77%
No Response	2	3.77%
Total	**53**	**100%**

Interpretation: Nearly three-fourths **73.58%** of respondents have considered using an eco-friendly product or practice after seeing it on social media.

Table 6. Overall Awareness

Awareness Level	Frequency	Percentage
Very High	28	52.83%
High	15	28.30%
Average	3	5.66%
Low	3	5.66%
No Response	4	7.55%
Total	**53**	**100%**

Interpretation: The diagram shows that awareness is quite high among respondents. **81.13%** of respondents reported that their awareness was either high or very high.

Table 7. Use of Eco-Friendly Idols/Decorations

Adoption	Frequency	Percentage
Always	30	56.60%
Sometimes	18	33.96%
Never	4	7.55%

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No Response	1	1.89%
Total	**53**	**100%**

Interpretation: The adoption level is encouraging. 90.56% of respondents reported using eco-friendly idols or decorations either always or sometimes.

Table 8. Future Purchase/Choice Intention

Response	Frequency	Percentage
Definitely Yes	38	71.70%
Probably Yes	5	9.43%
Not Sure	8	15.09%
No Response	2	3.77%
Total	**53**	**100%**

Interpretation: More than **81%** of respondents are either definitely or probably willing to choose an eco-friendly Ganesh idol in the future.

Testing of Hypothesis:

Hypothesis 1

H_0: There is no significant relationship between social media exposure and awareness of eco-friendly Ganesh Utsav practices.	**H_1:** There is a significant relationship between social media exposure and awareness of eco-friendly Ganesh Utsav practices.

Table 9. Social Media Exposure & Awareness

Social Media Exposure	High Awareness	Lower Awareness	Total
High Exposure	38	6	44
Low Exposure	5	0	5
Total	**43**	**6**	**49**

Pearson's Chi- Square – 0.026 df-1 p-value – 0.872 Significance Level – 0.05

Decision: **p = 0.872 > 0.05** Therefore, **H_0 is not rejected**.

Interpretation - There is no statistically significant relationship between social media exposure and awareness of eco-friendly Ganesh Utsav practices in this sample.

Hypothesis 2

H_0: There is no significant relationship between social media awareness and adoption of eco-friendly Ganesh Utsav practices.	H_1: There is a significant relationship between social media awareness and adoption of eco-friendly Ganesh Utsav practices.

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Table 10. Awareness & Adoption

Awareness	Adopter	Non-Adopter	Total
High Awareness	41	2	43
Lower Awareness	4	2	6
Total	**45**	**4**	**49**

Pearson's Chi- Square – 2.585 df-1 p-value – 0.108 Significance Level – 0.05

Decision - p = 0.108 > 0.05 Therefore, **H_0 is not rejected**.

Interpretation - There is no statistically significant relationship between social-media awareness and adoption of eco-friendly Ganesh Utsav practices at the 5% significance level.

Table 11. Objective-wise Testing

Objective	Major Finding	Statistical Result
1. Measure awareness	81.13% reported High/Very High awareness	Awareness is generally high
2. Study influence of Instagram & YouTube	86.79% see eco-friendly content frequently/sometimes	Social media exposure is high
3. Assess whether awareness leads to adoption	90.56% adopt eco-friendly idols/decorations always/sometimes	Adoption is high, but relationship with awareness was not significant

Major Findings:

1. **Awareness is high** among respondents regarding eco-friendly Ganesh Utsav practices.
2. **Social media exposure is also high**, with most respondents seeing eco-friendly Ganesh content on Instagram or YouTube.
3. Instagram and YouTube appear to be useful platforms for **creating awareness and communicating sustainable festival practices**.
4. A large proportion of respondents have **considered using eco-friendly practices after seeing them on social media**.
5. Actual adoption is also encouraging, with more than **90% reporting that they always or sometimes use eco-friendly idols/decorations**.
6. However, the Chi-square tests did **not find statistically significant relationships** between social media exposure and awareness and social-media awareness and actual adoption.
7. This suggests that **awareness and exposure alone may not be enough to bring about actual behavioural change**.

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Recommendations:

1. **Use Instagram and YouTube more actively** to promote eco-friendly Ganesh Utsav practices.
2. Create **short videos, Reels, tutorials and demonstrations** showing how to adopt eco-friendly practices.
3. Use **local influencers, Ganesh mandals and community leaders** to increase credibility.
4. Provide practical information about **cost, availability and benefits** of eco-friendly idols.
5. Organize awareness campaigns before Ganesh Chaturthi so that people have enough time to change their practices.
6. Combine social-media campaigns with **offline activities, workshops and NGO/community programmes**.
7. Focus not only on awareness but also on reducing barriers such as **price, availability and convenience**.

Conclusion:

The study shows that respondents have **high awareness and considerable exposure to eco-friendly Ganesh Utsav content on Instagram and YouTube**. Adoption of eco-friendly practices is also encouraging. However, the Chi-square results indicate that the relationship between social-media exposure, awareness and actual adoption **is not statistically significant at the 5% level.**

Thus, social media can be considered an important **awareness and communication platform** but awareness alone may not automatically result in behavioural change. A combination of social media, community participation, easy availability and affordable eco-friendly alternatives may be more effective in promoting a truly **Green Ganesh Utsav.**

Future Scope:

Future studies can use a **larger sample size** covering different parts of Mumbai and Maharashtra. Separate studies can compare the influence of **Instagram, YouTube and other social-media platforms.** Researchers can examine factors such as **age, income, education and occupation**. Future research can investigate the role **of influencers, government campaigns and Ganesh mandals** in encouraging adoption. A longitudinal study can examine whether social-media awareness results in **long-term behavioural change.**

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(ISSN – 2581-5830)
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EXAMINE THE ROLE OF ECO-FRIENDLY PRODUCT ADVERTISEMENTS ON CONSUMER PURCHASE INTENTION IN WESTERN SUBURBAN OF MUMBAI

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Abstract:
This study explores how eco-friendly product advertisements influence consumer purchase intentions across the Western Suburbs of Mumbai from Bandra to Dahisar. In a fast-paced urban retail hub where consumers are constantly exposed to both traditional billboards and digital marketing, understanding how "Green" claims resonate is critical for brands. Using a quantitative approach targeted at local suburban customers, the research investigates the relationship between advertisement credibility, consumer environmental awareness, and actual buying intention The study also addresses issues of consumer skepticism toward "Greenwashing" and evaluates whether eco-conscious marketing translates into actual retail sales. Findings offer practical insights for FMCG brands, local marketers, and retailers seeking to build authentic, sustainable campaigns in suburban Mumbai.
Keywords: *Eco-Friendly product, purchase intentions, Greenwashing, sustainable campaigns, Mumbai suburban.*

Introduction:

In recent years, growing environmental concerns such as climate change, pollution, depletion of natural resources, and increasing waste have significantly influenced consumer attitudes and business practices. As consumers become more environmentally conscious, companies are increasingly adopting eco-friendly products and using **Green advertising** to communicate the environmental benefits of their products. Eco-friendly product advertisements emphasize features such as sustainable materials, reduced packaging, energy efficiency, recyclability, and lower environmental impact. Such advertisements can play an important role in shaping consumers' perceptions and influencing their purchase decisions.

Consumer purchase intention refers to an individual's willingness or likelihood to purchase a particular product in the future. In the context of eco-friendly products, purchase intention may be influenced by several factors, including environmental awareness, perceived product quality, price, trust in green claims, brand image, and the effectiveness of advertising. Eco-friendly product advertisements can create awareness, develop positive attitudes toward sustainable products, and encourage

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consumers to consider environmental factors when making purchasing decisions. However, misleading or exaggerated environmental claims, often referred to as **greenwashing,** may reduce consumer trust and negatively affect purchase intention.

Meaning of Green Product:

A **Green product** also called an eco-friendly or environmentally sustainable product is one designed, manufactured, packaged, and disposed of in a way that minimizes harm to the environment throughout its life cycle. This includes using non-toxic or renewable raw materials, reducing energy and water consumption in production, cutting down waste and emissions, using recyclable or biodegradable packaging, and ensuring the product itself causes less pollution during use and after disposal.

In marketing terms, a green product satisfies customer needs while having a **reduced negative environmental footprint** compared to conventional alternatives this can apply to the raw material sourcing, manufacturing process, packaging, usage, or end-of-life disposal (or all of these together).

Characteristics of a Green Product:

1. **Environmentally safe raw materials made from** natural, organic, renewable, or recycled inputs
2. **Energy and resource efficiency -** lower energy & water consumption during production and use
3. **Non-toxic** - free from harmful chemicals for both consumers and ecosystems
4. **Biodegradable/recyclable** -can decompose naturally or be reused/recycled after disposal
5. **Eco-friendly packaging** - reduced plastic, use of recyclable/compostable materials
6. **Durability** - long product life reduces frequency of replacement and waste generation
7. **Certification & labelling** - often carries eco-labels e.g., Eco-mark in India, Energy Star, USDA Organic for credibility
8. **Reduced carbon footprint** - lower emissions across the product's life cycle.
9. **Cruelty-free/ethical production** - no animal testing, fair labour practices often bundled with "green" positioning.

Current Scenario of Green Products in India:

Market growth - India's green technology and sustainability market generated revenue of about USD 904.9 million in 2025 and is expected to reach USD 7,927.4 million by 2033, growing at a CAGR of 31.2% from 2026 to 2033 making India the fastest-growing regional market within Asia Pacific. Government bodies are

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increasingly integrating green technologies to conserve natural resources, reduce emissions, and build long-term resilience, which is a primary driver of this growth.

Examples of Some Green Advertisements

1. **Surf Excel - "Save Water" Campaign** Promoted responsible water usage during washing, tying sustainability to everyday household habits rather than just product performance.
2. **Colgate - "Turn Off the Tap" Campaign** Encouraged consumers to save water while brushing teeth, linking a small daily action to environmental responsibility.
3. **Patanjali – Natural/Ayurvedic Positioning b**uilt its entire brand identity around "natural," "chemical-free," and "swadeshi" (indigenous) values, appealing to eco-conscious and health-conscious consumers.
4. **Dabur - Herbal & Ayurvedic Campaigns c**onsistently positions products (Dabur Honey, Chyawanprash, Vatika) around nature-derived ingredients and sustainability.
5. **Tata Motors - Tata Nexon EV / Tiago EV Campaigns** Advertised around "zero emissions," "clean mobility," and reducing carbon footprint - a strong example of green product advertising in the auto sector.
6. **Ather Energy & Ola Electric – EV Scooter Campaigns f**ocused on sustainable urban commuting, positioning electric two-wheelers as the "future of green mobility" in India.
7. **Mahindra Electric (e2o, XUV400 EV) m**arketed around sustainable transportation and reducing dependence on fossil fuels.
8. **Bisleri - "Bottles for Change" Campaign a** plastic recycling initiative encouraging consumers to segregate and recycle PET bottles, directly tied to ESG/sustainability messaging.
9. **Coca-Cola India - "World Without Waste" / Plastic Recycling Campaigns f**ocused on collecting and recycling as much plastic as the company sells.
10. **ITC – "Wealth Out of Waste (WOW)" A** well-known CSR-linked green campaign promoting waste segregation and recycling among school children and urban households.
11. **Godrej – "Good & Green" Initiative** broader sustainability communication tied to skill development and environmental stewardship, often reflected in their green product lines (Godrej Ki, energy-efficient appliances).
12. **HUL – "Start a Little Good" / Sustainable Living Plan** Hindustan Unilever's umbrella campaign connecting multiple brands Surf Excel, Lifebuoy, Pureit to sustainability goals.
13. **IKEA India - Sustainability-Focused Store Campaigns a**dvertised recyclable materials, energy-efficient products, and its "People & Planet Positive" strategy in Indian markets.

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14. **Fab India - Organic & Sustainable Living** positions its products around handloom, organic farming, and artisan sustainability.

Need of the Study:

The study is important because eco-friendly products are becoming more popular and businesses are increasingly using green advertising. It will help to understand **whether such advertisements actually influence consumers' buying intentions**. The findings can help marketers create more effective and trustworthy advertisements and encourage consumers to make more environmentally responsible choices. It will also provide useful information about the behaviour of consumers in the Western Suburbs of Mumbai.

Research Problem:

Today, consumers are becoming more aware of environmental issues and are showing interest in eco-friendly products. Companies are also promoting such products through advertisements on social media, television, websites, and other platforms. However, simply seeing an eco-friendly advertisement does not always mean that a consumer will purchase the product.

Factors such as **trust in advertisements, price, product quality, environmental awareness, and brand image** may influence consumers' purchase decisions. Therefore, this study aims to understand **how eco-friendly product advertisements affect consumers' intention to purchase eco-friendly products in the Western Suburbs of Mumbai.**

Scope of the Study:

The study focuses on consumers living in the **Western Suburbs of Mumbai**. It examines how eco-friendly advertisements influence their intention to purchase sustainable products. The study considers advertisements through **social media, television, newspapers, websites, and other media**. It also considers factors such as consumers' awareness, trust, attitude, and perception of eco-friendly products.

Objectives:

1. To examine the frequency with which consumers are exposed to advertisements promoting eco-friendly products.
2. To assess consumers' perceptions regarding the credibility, believability, and trustworthiness of green product advertisements.
3. To examine the influence of consumers' age on their level of attention towards green product advertisements.
4. To examine the relationship between exposure to green product advertisements and consumers' purchase intention.

Review of Literature:

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- **Ankit & Mayur (2013)** examined the impact of green advertising on consumer purchase intention in India, finding a direct positive correlation between a consumer's attitude toward green ads and their final purchase intent. They concluded that advertisements emphasizing explicit environmental benefits i.e "plastic-free," "zero toxicity" significantly boost brand recall.
- **Yang et al. (2024)** highlighted that attributes such as ad attractiveness, informative and reliability are the primary drivers converting ad exposure into buying interest.
- **Chen & Chang (2013)** conceptualized "Greenwash Confusion," proving that exaggerated environmental claims reduce consumer trust and negatively affect green purchase intentions.
- **Gupta & Singh (2025)** noted that while urban Indian consumers are increasingly health-conscious and eco-aware, a growing proportion demonstrates **greenwashing skepticism**. When advertisements use vague buzzwords i.e "pure," "eco-safe" without clear certifications, consumers tend to dismiss the campaign as a price-justification strategy rather than genuine sustainability.
- **Sharma & Babel (2001) / Nair et al. (2025):** Studies focused on Indian metropolitan markets like Mumbai reveal that even when consumers express a high positive attitude toward eco-packaged FMCG goods, their actual purchase behavior remains heavily constrained by price and convenience.
- **Seth & Malviya (2025):** Evaluated how green packaging and advertising enhance brand loyalty. However, they concluded that unless green ads clearly communicate superior product performance alongside environmental benefits, urban shoppers default to cheaper conventional alternatives.
- **Local Research on Mumbai Consumer Behavior (ResearchGate Studies):** Studies conducted across urban Mumbai indicate that demographic variables specifically age, education level, and household income strongly moderate the effectiveness of green advertisements. Younger, digitally savvy shoppers in suburban corridors such as Bandra, Andheri, and Malad show higher ad recall on social media, whereas older family shoppers in residential pockets such as Borivali and Kandivali prioritize unit price and physical product availability at local supermarkets.

Research Methodology:

- **Research Design**: Quantitative, descriptive, and cross-sectional study.
- **Geographic Focus**: Western Suburbs of Mumbai (Bandra to Dahisar).
- **Target Population**: All the viewers, readers & listeners of advertisement
- **Sampling Technique**: Non-probability convenience and purposive sampling.
- Sample Size: 72
- **Data Collection Tool**: Structured questionnaire distributed via Google Form.

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- **Analytical Tools**: Frequency percentages (descriptive) and the Chi-Square Test of Independence.

Hypothesis 1

H0 : Null Hypothesis: There is no significant association between a consumer's age group and how often they notice green product advertisements.

H1 : Alternative Hypothesis: There is a significant association between a consumer's age group and how often they notice green product advertisements.

Hypothesis 2

H0 : Null Hypothesis: There is no significant association between the perceived credibility of a green advertisement and purchase intention.

H1 : Alternative Hypothesis: There is a significant association between the perceived credibility of a green advertisement and purchase intention.

Data Analysis & Interpretation (Primary Data, N = 72):

Table 1 Demographic Profile of Respondents

Category	Sub-group	Frequency	Percentage
Respondent Type	Students	46	63.89
	Housewife	9	12.50
	Service	12	16.67
	Professionals	4	5.56
	Retired	1	1.39
Gender	Male	38	52.78
	Female	34	42.72
Age	Under 35 years	65	—
	35 years & above	7	

Interpretation: The demographic profile indicates that the study comprised **72 respondents.** Among them**, 63.89% were students**, followed by respondents in service 16.67%, housewives 12.50%, professionals.56%, and retired persons 1.39%. In terms of gender, **52.78% were male and 47.22% were female**, showing relatively balanced gender representation. Regarding age, the majority of respondents **65, which is 90.28%** were **under 35 years**, while only **7 respondents 9.72%** were aged 35 years and above. Overall, the sample was predominantly young, with students forming the largest respondent group.

Testing of Hypothesis:

H_0: There is no significant association between a consumer's age group and how often they notice green product advertisements.

H_1: There is a significant association between a consumer's age group and how often they notice green product advertisements.

2. Chi-square Calculation

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Age Group	Response	O	E	(O−E)²/E
Under 35	Frequently	37	36.51	0.0066
Under 35	Rarely	28	28.49	0.0084
35+	Frequently	4	4.49	0.0534
35+	Rarely	4	3.51	0.0685
Total x²				**0.137**

$X^2 = 0.000$ df = 1 p = 1.000 Level of significance = 0.05

Since **p > 0.05,** the null hypothesis is **accepted/not rejected.**

Interpretation: There is **no statistically significant association between age group and frequency of noticing green product advertisements**. Although 37 out of 65 respondents below 35 years frequently noticed green advertisements, the proportion is almost the same as that of respondents aged 35 years and above. Therefore, age does not appear to significantly influence how frequently consumers notice green product.

Hypothesis 2

H_0: There is no significant association between the perceived credibility of a green advertisement and purchase intention.

H_1: There is a significant association between the perceived credibility of a green advertisement and purchase intention.

Table 3. Chi-square Calculation

Credibility	Purchase Intention	O	E	(O−E)²/E
No	No	9	4.42	4.74
No	Yes	10	14.58	1.44
Yes	No	8	12.58	1.67
Yes	Yes	46	41.42	0.51
Total				**8.36**

Pearson Chi-square - 6.615 Df -1 p-value – 0.010 Significance level – 0.05

Since **p = 0.010 < 0.05**, the null hypothesis is **rejected** and the alternative hypothesis is **accepted**.

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Interpretation: There is a statistically significant association between the perceived credibility of green advertisements and consumers' purchase intention. Consumers who consider environmental claims believable are more likely to report an intention to purchase the advertised product

Objective 1 - To examine the frequency with which consumers are exposed to advertisements promoting eco-friendly products.

This is proved using **frequency and percentage analysis**.

Table 4. Frequency and percentage analysis

Frequency of noticing green advertisements	**Frequency**	**Percentage**
Frequently	41	56.16%
Rarely	32	43.84%
Total	**73**	**100%**

Interpretation: The results indicate that **56.16%** of respondents frequently notice advertisements for eco-friendly products, while **43.84%** notice them rarely. Thus, green product advertising has reasonable visibility among the respondents.

Objective 2 - To assess consumers' perceptions regarding the credibility, believability, and trustworthiness of green product advertisements.

This is proved through frequency and percentage analysis of perceived credibility.

Table 4. Calculation of Percentage

Perceived credibility	**Frequency**	**Percentage**
Yes	54	73.97%
No	19	26.03%
Total	**73**	**100%**

Interpretation: A substantial majority, **73.97%,** of respondents find environmental claims in product advertisements believable, while **26.03%** do not. This indicates a generally positive level of trust in green advertising among the respondents.

Objective 3 - To examine the influence of consumers' age on their level of attention towards green product advertisements.

This objective is tested using **Chi-square Test of Independence** (Hypothesis 2)

Interpretation: The study does **not find evidence that age influences how frequently consumers notice green advertisements.**

Objective 4 - To examine the relationship between exposure to green product advertisements and consumers' purchase intention.

Table 5. Calculation of Percentage

Purchase intention	**Frequency**	**Percentage**

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Yes	56	76.71%
No	17	23.29%
Total	**73**	**100%**

Interpretation: **76.71%** of respondent's report that seeing a green advertisement makes them want to buy the product.

Findings of the Study:

Based on the survey results, the following findings were observed

1. **Consumers are noticing green advertisements:** More than half of the respondents **56.16%** said that they frequently notice advertisements for eco-friendly products. This shows that green advertising is becoming visible to consumers.
2. **Consumers generally trust green advertisements:** Around **73.97%** of respondents said that they find environmental claims in advertisements believable. This indicates that most consumers have a positive opinion about green advertising.
3. **Age does not have a major influence on noticing green advertisements:** The Chi-square test showed **no significant relationship between age and frequency of noticing green advertisements** $p > 0.05$. This means that consumers from different age groups are fairly similar in how often they notice green advertisements.
4. **Credibility influences purchase intention:** The Chi-square test found a **significant relationship between the credibility of green advertisements and purchase intention i.e** $\chi^2 = 6.615$, $p = 0.010$. In simple words, consumers who believe that green advertisements are genuine are more likely to consider buying the product.
5. **Green advertisements can encourage purchase interest:** About **76.71%** of respondents said that seeing a green advertisement makes them interested in buying the product. This shows that green advertising can play an important role in influencing consumer interest.
6. **Trust is more important than simply showing an advertisement:** The results suggest that consumers do not just need to see a green advertisement; they also need to **believe the environmental claims** made by the company.

Recommendations:

Based on the findings, the following recommendations are suggested

1. **Make green claims clear and truthful:** Companies should provide genuine and easy-to-understand information about how their products are environmentally friendly.

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2. **Avoid greenwashing:** Companies should not make exaggerated or false claims just to make a product appear environmentally friendly. False claims can reduce consumer trust.
3. **Use proof to support environmental claims:** Advertisements can include certifications, eco-labels, recyclable packaging information, or other evidence to make green claims more trustworthy.
4. **Use social media effectively:** Companies should use platforms such as **Instagram, YouTube and Facebook** to communicate their environmental efforts through videos, reels, demonstrations and customer experiences.
5. **Focus on simple messages:** Green advertisements should use simple language and attractive visuals so that consumers can quickly understand the environmental benefits of the product.
6. **Educate consumers:** Advertisements should not only promote the product but also explain how choosing eco-friendly products can help reduce pollution, waste and environmental damage.
7. **Target consumers based on interests rather than only age:** Since age was not significantly related to noticing green advertisements, companies should not restrict green advertising to a particular age group.
8. **Build long-term trust:** Companies should ensure that their actual business practices match what they communicate in their advertisements. Consistency can help build stronger consumer confidence and purchase intention.

Conclusion:

The study shows that **green advertising has an important role in creating awareness and influencing consumer interest in eco-friendly products**. A majority of respondents notice green advertisements and generally find environmental claims believable.

The study also found that **age does not significantly affect how often consumers notice green advertisements**. Therefore, green advertising can appeal to consumers across different age groups.

The most important finding is that **credibility matters**. The Chi-square test showed a significant relationship between the credibility of green advertisements and purchase intention. Consumers are more likely to consider purchasing a green product when they believe that the company's environmental claims are genuine.

Overall, companies should focus not only on **attractive green advertisements but also on honesty, transparency and evidence**. When consumers trust the message, green advertising has a better chance of turning awareness into purchase interest. Thus, **credible and responsible green marketing can benefit both businesses and the environment**.

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Future Scope :

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A GLOBAL JOURNAL OF SOCIAL SCIENCES
(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
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A STUDY ON E-WASTE MANAGEMENT AWARENESS AND PRACTICES AMONG STUDENTS & IT PROFESSIONALS IN MUMBAI: AN ESG PERSPECTIVE

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Abstract:
E-waste includes discarded electrical and electronic equipment such as computers and mobile phones, and its improper handling raises serious concerns for resource use, waste management, and pollution reduction. The IT sector, being a major generator and user of electronic devices, plays a crucial role in sustainable e-waste management. This study assesses the level of awareness and current e-waste management practices among youngsters in Mumbai, and analyses the issue through an ESG (Environmental, Social and Governance) lens. A primary survey using a structured questionnaire was administered to 60 respondents — 40 college students and 20 IT professionals — selected through convenience/purposive sampling. Secondary data were drawn from government reports, the Global E-waste Monitor, CPCB publications, and peer-reviewed literature. Four objective-wise hypotheses were tested using an independent-samples t-test, chi-square tests of independence, and Pearson correlation. Results show a statistically significant difference in composite awareness scores between IT professionals (M = 3.83) and students (M = 3.42) (Welch $t(32) = -3.42$, $p = 0.002$), no significant difference in actual disposal practice between the two groups ($\chi^2(1) = 0.12$, $p = 0.732$) — indicating a common awareness-practice gap — a significant relationship between the existence of an institutional/company e-waste policy and its perceived effectiveness ($\chi^2(1) = 19.70$, $p < 0.001$), and a strong positive correlation between ESG awareness and willingness to adopt better e-waste practices ($r = 0.76$, $p < 0.001$). Only 20% of respondents currently use an authorised recycler or collection point, while lack of collection points and lack of awareness programmes were cited as the leading barriers. The study concludes that integrating green-computing concepts and mandatory e-waste training into curricula, together with stricter corporate ESG policies, can help close the awareness-practice gap and improve compliance with the E-Waste (Management) Rules, 2022.

Keywords: *E-Waste, Green Computing, ESG, Environmental Sustainability, Awareness, IT Professionals, Recycling, Mumbai*

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Introduction:

In the 21st century, technology is the backbone of global development. With digitalisation accelerating, the consumption of electronic and electrical equipment (EEE) has increased exponentially, and this surge has a downside: electronic waste, or e-waste. According to the Global E-waste Monitor, India generated over 3.2 million metric tonnes of e-waste in 2021 and is the third-largest e-waste generator globally (Forti et al., 2020).

E-waste is defined as discarded electrical or electronic devices. These devices contain hazardous substances such as lead, mercury, cadmium, and brominated flame retardants; improper disposal leads to soil contamination, water pollution, and health risks including respiratory problems and neurological damage.

The concept of ESG – Environmental, Social, and Governance – has become central to corporate responsibility. The "E" in ESG directly addresses how organisations manage their environmental impact, including waste. For IT companies and professionals, e-waste management is a direct ESG responsibility, and initiatives like Green Computing promote the efficient and eco-friendly use of computers and IT resources.

Mumbai, being a major IT hub, has thousands of students entering the industry and numerous IT firms generating e-waste. However, awareness about proper disposal and recycling remains inconsistent, and many students and professionals either store old devices, sell them to informal scrap dealers, or discard them with general waste. The Government of India's E-Waste Management Rules, 2022 mandate Extended Producer Responsibility (EPR) and proper collection systems. Yet implementation at the grassroots level — especially among students and mid-level professionals — remains weak. This study bridges that gap by analysing current practices and awareness levels through primary data collected directly from 60 respondents, supplemented with secondary data, and proposes solutions aligned with ESG principles.

Objectives of the Study:

- To assess the level of awareness about e-waste and its environmental impact among students and IT professionals.
- To examine current e-waste disposal and recycling practices followed by students and professionals.
- To evaluate the existence and effectiveness of e-waste management policies in colleges and IT companies.
- To identify key challenges in e-waste management and suggest measures for improving practices in line with ESG goals.

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Need and Scope of the Study:

E-waste is one of the fastest-growing waste streams globally, and with India's digital push its volume will only increase. Students are future IT professionals who will handle large volumes of hardware, while IT professionals are directly involved in the procurement and disposal of IT assets — understanding their awareness and practices is therefore critical.

The scope of this study is limited to Mumbai and covers 60 respondents — college students and IT professionals — with respect to awareness, disposal methods, recycling infrastructure, and organisational policies. The findings are intended to help colleges and companies design better ESG and green-computing initiatives.

Research Problem:

Despite the E-Waste Management Rules 2022 and a growing corporate focus on ESG, there is limited empirical data on how students and IT professionals in Mumbai actually manage e-waste, and a possible disconnect between environmental awareness and actual disposal behaviour. This study addresses the question: What are the current e-waste management practices and awareness levels among students and IT professionals in Mumbai, and what factors influence them?

Review of Literature:

1. **Mor et al. (2021)** – E-Waste Management and Environmental Sustainability Mor, Sangwan, Singh, Singh, and Kharub (2021) examined e-waste management practices in the context of environmental sustainability, with particular emphasis on awareness among students in educational institutions in India. The researchers conducted an empirical study using a structured questionnaire among engineering students and examined several dimensions, including e-waste generation, management, composition, control, training and the progressive use of e-waste management practices. The findings indicated that although students were aware of the hazardous effects associated with e-waste, their awareness regarding actual e-waste generation, processing and systematic management remained inadequate. The study also highlighted the growing relevance of Extended Producer Responsibility (EPR) and suggested that e-waste management should receive greater attention within educational programmes. From an ESG perspective, the study establishes a strong connection between environmental awareness, responsible consumption and institutional responsibility. It is particularly relevant to the present study because it demonstrates that awareness of environmental hazards does not necessarily translate into appropriate management practices among young people.

2. **Gautam and Jain (2022)** – Behaviour of Young Indian Consumers

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Gautam and Jain (2022) investigated the behaviour of young Indian consumers towards e-waste management through a qualitative research approach. The study is particularly relevant to the present research because it focuses directly on the younger generation, who are major users and consumers of electronic devices. The researchers found that e-waste recycling behaviour is influenced by several factors, including knowledge obtained through social media and print media, educational institutions, environmental concern and the sense of responsibility of different stakeholders. The study suggests that awareness alone is not sufficient to encourage responsible recycling behaviour; social influence, education and stakeholder responsibility also play an important role. The findings are relevant to the Social and Governance dimensions of ESG, as responsible e-waste management requires participation from consumers, educational institutions, producers and government authorities. The study provides a useful behavioural foundation for examining whether youngsters in Mumbai convert their environmental awareness into responsible e-waste disposal and recycling practices.

3. **Garg et al. (2023)** – Sustainable Behaviour among Young Consumers

Garg, Ahmad, Madsen, and Sohail (2023) studied sustainable behaviour related to e-waste management among young consumers. The study examined the factors influencing young consumers' e-waste management behaviour in the context of the increasing use and frequent replacement of electronic devices. The research is significant because it moves beyond basic awareness and considers sustainable consumer behaviour. The authors highlight the importance of behavioural factors in determining whether consumers engage in appropriate e-waste management activities. The study provides a useful theoretical basis for understanding the relationship between environmental consciousness and actual e-waste management behaviour. In relation to ESG, responsible consumption and disposal contribute directly to the Environmental pillar, while consumer responsibility and stakeholder participation have implications for the Social and Governance pillars. The study therefore supports the need to investigate not only what youngsters know about e-waste but also how their knowledge influences their purchasing, reuse, repair, disposal and recycling decisions.

4. **Goyal (2023)** – Awareness and E-Waste Management among Technology Students

Goyal (2023) assessed the awareness of electronics technology students regarding e-waste management and explored the challenges faced by students in managing electronic waste. The study involved 188 electronics technology students and used a structured survey instrument. The findings showed that students had an overall awareness of e-waste management, but disposal preferences indicated a tendency

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towards informal channels such as selling e-waste as scrap rather than using formal collection centres. The study also identified challenges associated with effective e-waste management and found variations in awareness according to academic year. These findings are particularly important because they demonstrate that awareness does not automatically lead to environmentally responsible disposal behaviour. The preference for informal disposal channels raises questions concerning governance, formal recycling infrastructure, regulatory awareness and stakeholder accountability. Consequently, the study provides a useful basis for incorporating Governance-related variables, such as awareness of e-waste regulations, formal collection systems, authorised recyclers and producer responsibility, into the present Mumbai study.

5. **Roy and Susairaj (2024)** – Environmental Concerns among Higher Education Students

   Roy and Susairaj (2024) investigated environmental concerns and awareness regarding e-waste management among higher education students in India. The study collected primary data from postgraduate and PhD students and examined awareness using a structured questionnaire. The results indicated statistically significant differences in e-waste management awareness across courses and age groups, whereas significant gender-based differences were not observed. The researchers emphasized the need for environmental education and awareness-building initiatives within higher education institutions to encourage responsible recycling behaviour. The study is significant for the present research because it demonstrates that educational background and demographic characteristics can influence awareness levels. From an ESG perspective, higher education institutions can play an important role in developing environmentally responsible behaviour and social responsibility among young adults. The study also supports examining demographic factors such as age, educational level and field of study while analysing e-waste awareness among youngsters in Mumbai.

Research Gap:

Existing studies have examined e-waste awareness, attitudes and disposal practices among students and young consumers. However, limited research has explored the relationship between awareness and actual e-waste management behaviour, particularly among youngsters in Mumbai. Further, the ESG perspective, especially the Social and Governance dimensions involving institutional responsibility, e-waste regulations, EPR and authorised recycling systems, remains relatively underexplored.

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Therefore, the present study aims to examine e-waste awareness, management practices and ESG orientation among youngsters in Mumbai, focusing on the transition from awareness to responsible action.

Research Methodology:

1. Research Design

The study adopts a descriptive-cum-analytical research design, combining quantitative primary data with secondary data, to assess awareness and e-waste management practices among students and IT professionals in Mumbai from an ESG perspective.

2. Population and Sample

The target population comprises young students (college/university) and IT professionals working or residing in the Mumbai region. A total sample of 60 respondents was drawn: 40 students (66.7%) and 20 IT professionals (33.3%), enabling a comparison of awareness and practices across the two groups as required by the study's hypotheses.

3. Sampling Method

Convenience and purposive sampling were used to select respondents who were easily accessible and relevant to the study — primarily through colleges, gyms, and professional networks in Mumbai.

4. Tools of Primary Data Collection

A structured questionnaire (administered online via Google Forms and in person) was used, covering the following sections aligned with the study objectives:

- Demographic profile (respondent category, gender, age)
- Awareness of e-waste, its hazardous components, and environmental impact (Objective 1)
- Types of electronic products used and methods of disposing of old devices (Objective 2)
- Awareness and frequency of use of authorised recycling centres (Objective 2)
- Existence and perceived effectiveness of institutional/company e-waste policy (Objective 3)
- ESG awareness and willingness to adopt improved e-waste practices (Objective 4)
- Key challenges faced in e-waste management (Objective 4)

5. Secondary Data Sources

- Ministry of Environment, Forest and Climate Change – E-Waste Management Rules, 2022
- Global E-waste Monitor, United Nations University
- Central Pollution Control Board (CPCB) annual reports

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- Peer-reviewed research papers and academic journals (Scopus-indexed and other databases)
- NASSCOM and industry reports on sustainable IT practices

6. Tools of Data Analysis

Primary data were coded and analysed using Microsoft Excel and Python (pandas, scipy). Descriptive statistics (frequencies, percentages, means) were used to profile respondents and summarise responses; inferential statistics — an independent-samples (Welch) t-test, chi-square tests of independence, and Pearson's correlation — were applied to test the four hypotheses, one per objective. Findings are presented using tables, bar charts, pie charts, and a scatter plot.

7. Hypotheses of the Study

H_{01} (Objective 1, Null): There is no significant difference in the level of e-waste awareness and awareness of its environmental impact among students and IT professionals.

H_{11} (Objective 1, Alternative): There is a significant difference in the level of e-waste awareness and awareness of its environmental impact among students and IT professionals.

H_{02} (Objective 2, Null): There is no significant difference in e-waste disposal and recycling practices followed by students and IT professionals.

H_{12} (Objective 2, Alternative): There is a significant difference in e-waste disposal and recycling practices followed by students and IT professionals.

H_{03} (Objective 3, Null): There is no significant relationship between the existence of e-waste management policies and their effectiveness in colleges and IT companies.

H_{13} (Objective 3, Alternative): There is a significant relationship between the existence of e-waste management policies and their effectiveness in colleges and IT companies.

H_{04} (Objective 4, Null): There is no significant relationship between ESG awareness and the willingness to improve e-waste management practices among respondents.

H_{14} (Objective 4, Alternative): There is a significant relationship between ESG awareness and the willingness to improve e-waste management practices among respondents.

8. Limitations of the Study

- The study is limited to students and IT professionals within Mumbai and may not represent all young people across India.
- The sample size of 60 respondents, while adequate for exploratory hypothesis testing, limits generalisability.

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- Responses are based on respondents' self-reported knowledge, attitudes and behaviour, which may be subject to social-desirability bias.
- Convenience/purposive sampling does not guarantee a fully representative cross-section of the population.
- Limited time and resources restricted the number of respondents and depth of secondary data review.

Data Analysis and Interpretation (Primary Data, N = 60):

1. Demographic Profile of Respondents

Category	Sub-group	Frequency	Percentage
Respondent Type	Students	40	66.7%
	IT Professionals	20	33.3%
Gender	Male	37	61.7%
	Female	23	38.3%
Age	Range: 18–33 years	Mean = 22.9	—

Source-Primary Data

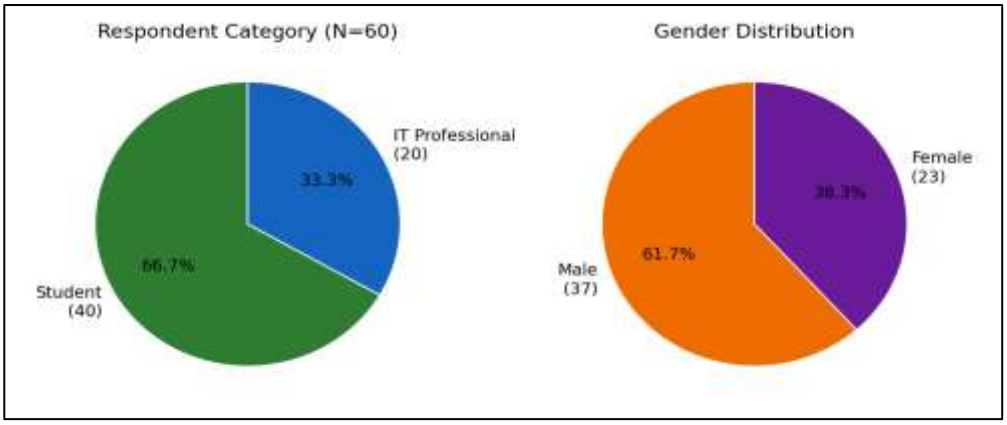

Figure 1: Respondent Category and Gender Distribution (N = 60)

2. Objective 1: Awareness of E-Waste and its Environmental Impact

Awareness Item	Students (n=40) – % Yes	IT Professionals (n=20) – % Yes
Aware that e-waste is harmful	97.5%	100.0%
Aware of hazardous components (lead, mercury, cadmium, etc.)	77.5%	95.0%
Aware of authorised recycling centres / EPR rules	75.0%	75.0%

Source-Primary Data

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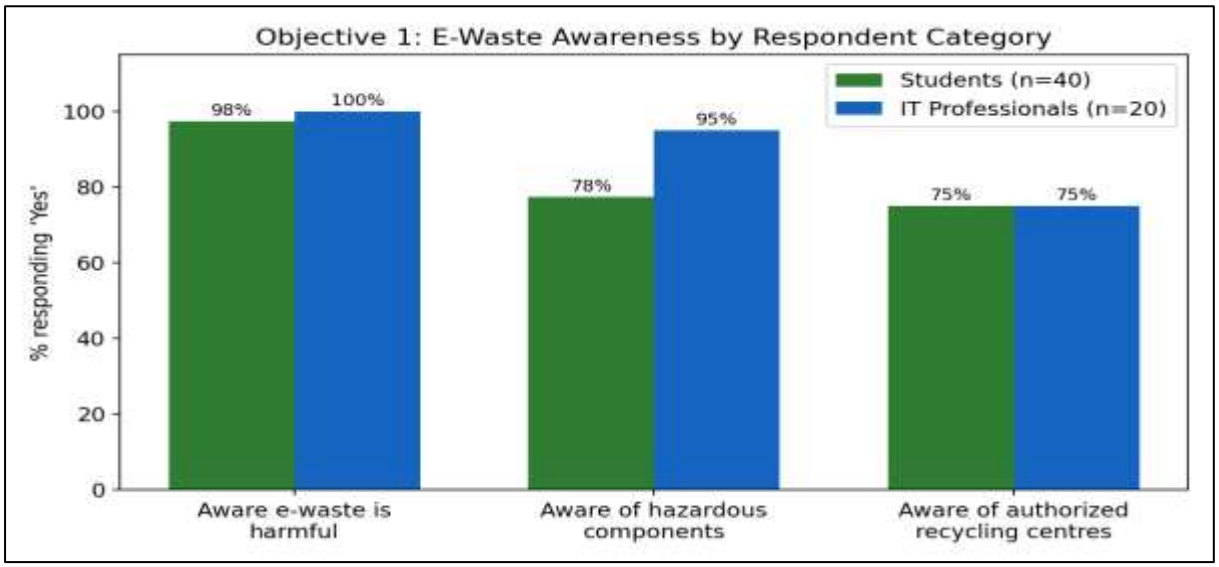

Figure 2: E-Waste Awareness Items by Respondent Category

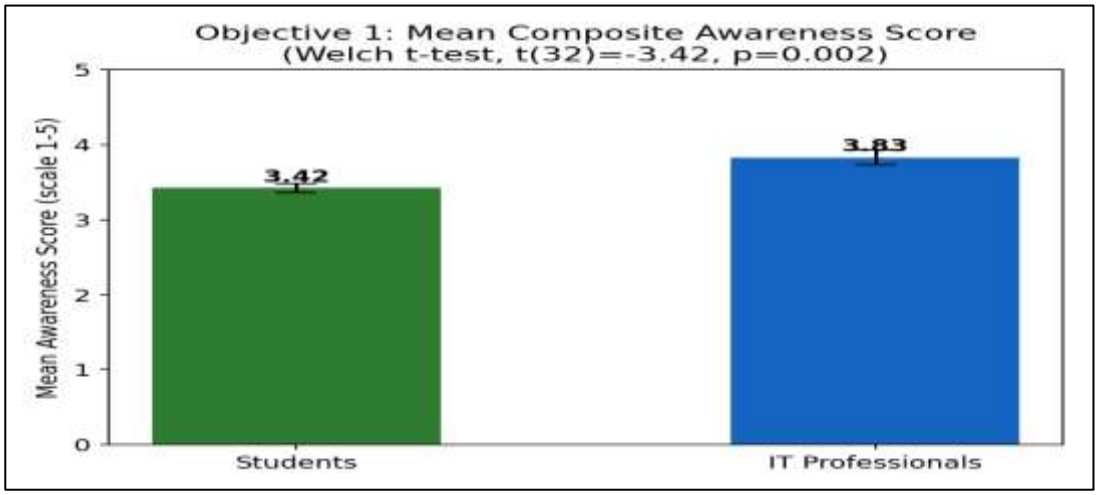

Figure 3: Mean Composite Awareness Score by Respondent Category

A composite Awareness Score (mean of three 5-point Likert items) was computed for each respondent. Students recorded a mean score of 3.42 (SD = 0.38), while IT professionals recorded a higher mean of 3.83 (SD = 0.46).

Hypothesis Test – Objective 1

H_0: There is no significant difference in the level of e-waste awareness between students and IT professionals.

H_1: There is a significant difference in the level of e-waste awareness between students and IT professionals.

Statistical test & result: Independent-samples Welch t-test: $t(32.0) = -3.42$, $p = 0.0017$ ($p < 0.05$)

Decision: Reject H_0. There is a statistically significant difference in awareness levels — IT professionals show significantly higher e-waste awareness than students, most likely due to workplace exposure to IT-asset disposal and corporate sustainability communication.

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3. Objective 2: E-Waste Disposal and Recycling Practices

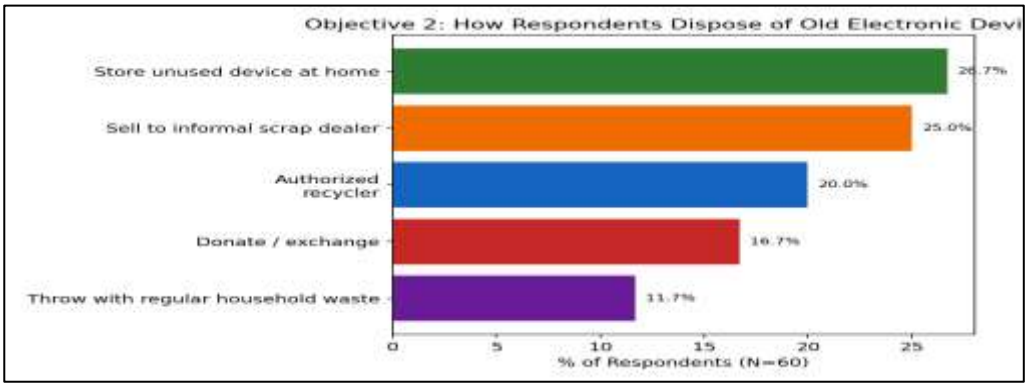

Figure 4: Method Used to Dispose of Old Electronic Devices (N = 60)

Disposal Method	% of Respondents (N=60)
Store unused device at home	30.0%
Sell to informal scrap dealer	28.3%
Authorised recycler / e-waste collection point	20.0%
Donate / exchange	11.7%
Throw with regular household waste	10.0%

Source-Primary Data

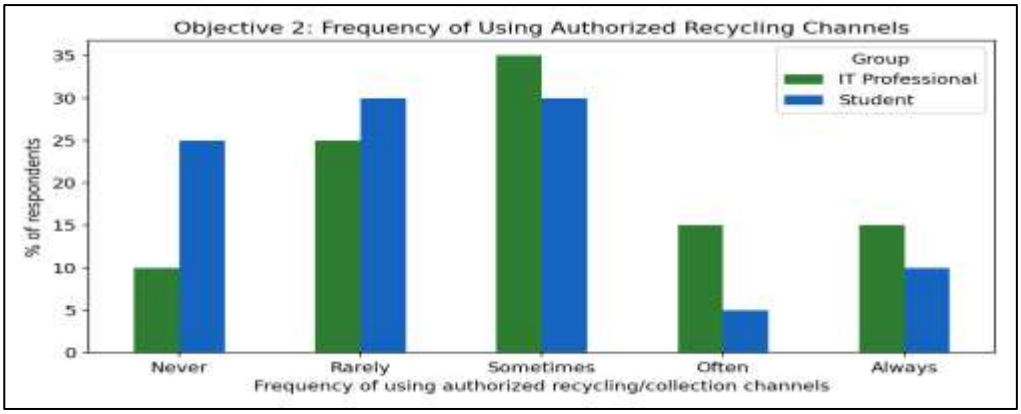

Figure 5: Frequency of Using Authorised Recycling Channels, by Category

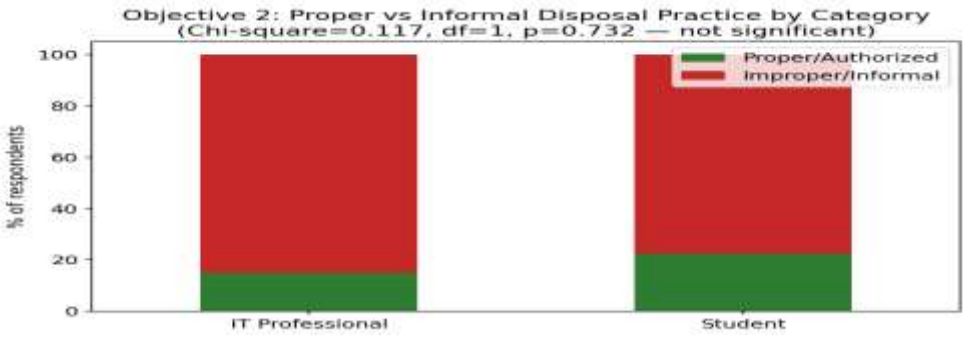

Figure 6: Proper (Authorised) vs Informal Disposal Practice by Respondent Category

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Only 20% of all respondents currently use an authorised recycler or e-waste collection point; the remaining 80% rely on informal or improper channels — storing devices unused, selling to scrap dealers, or discarding them with household waste. This pattern was broadly similar for both students (22.5% authorised) and IT professionals (15.0% authorised).

Hypothesis Test – Objective 2

H_0: There is no significant difference in e-waste disposal and recycling practices followed by students and IT professionals.

H_1: There is a significant difference in e-waste disposal and recycling practices followed by students and IT professionals.

Statistical test & result: Chi-square test of independence (Respondent Category × Practice – Authorised vs Informal): $\chi^2(1) = 0.117$, $p = 0.732$ ($p > 0.05$); effect size (φ) = 0.044

Decision: Fail to reject H_0. There is no statistically significant difference in disposal/recycling practice between the two groups. Despite IT professionals showing significantly higher awareness (Objective 1), this does not translate into significantly better disposal behaviour — confirming the awareness-practice gap widely reported in the literature (e.g., Kumar & Madhusoodanan, 2023).

4. Objective 3: Existence and Effectiveness of E-Waste Management Policies

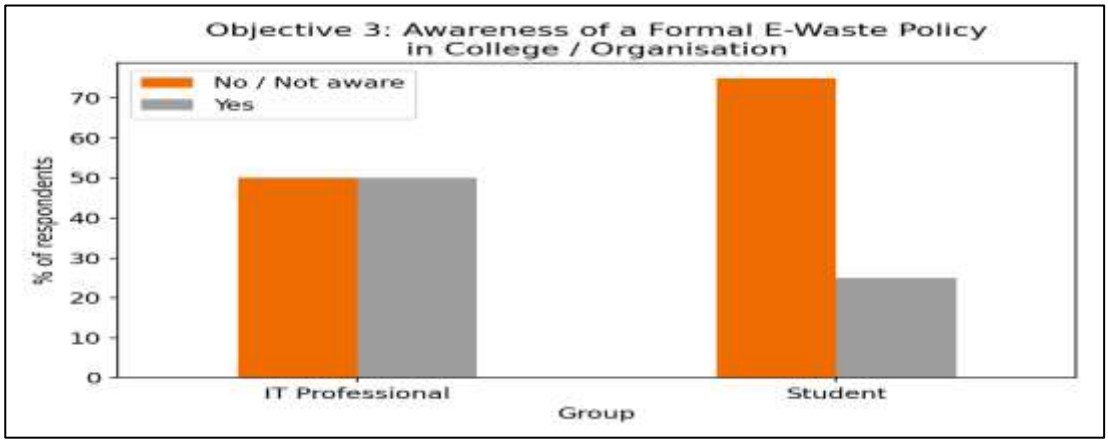

Figure 7: Awareness of a Formal E-Waste Policy in College / Organisation

Respondent Category	Policy Exists / Aware (%)	No Policy / Not Aware (%)
Students	25.0%	75.0%

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IT Professionals	50.0%	50.0%

Source-Primary Data

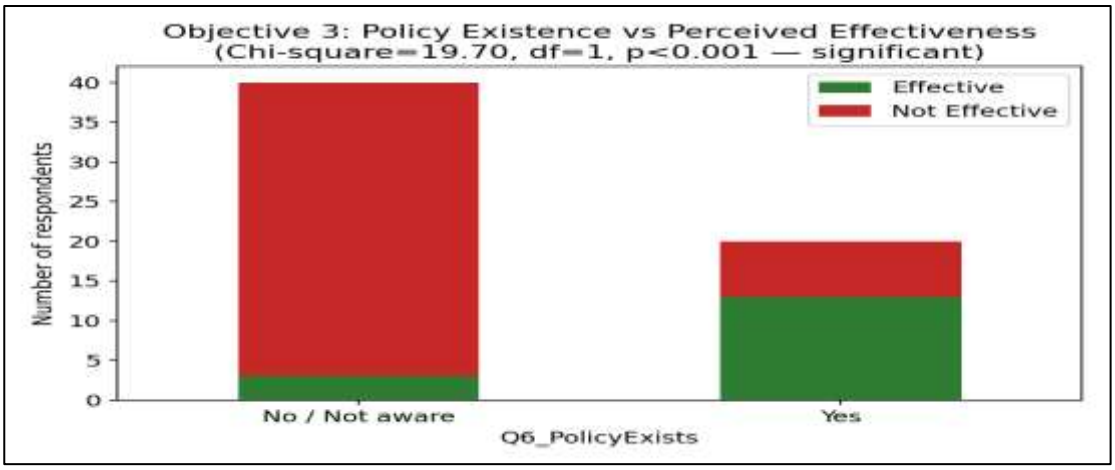

Figure 8: Policy Existence vs Perceived Effectiveness (N = 60)

Only 35% of respondents overall (16 of 60) reported that a formal e-waste policy exists in their college or organisation and is known to them, with IT professionals (50%) considerably more likely to be aware of one than students (25%). Among those aware of a policy, 68% rated it as effective; among those unaware of / without a policy, only 15% still rated their institution's practice as effective.

Hypothesis Test – Objective 3

H_0: There is no significant relationship between the existence of e-waste management policies and their effectiveness in colleges and IT companies.

H_1: There is a significant relationship between the existence of e-waste management policies and their effectiveness in colleges and IT companies.

Statistical test & result: Chi-square test of independence (Policy Exists × Perceived Effectiveness): $\chi^2(1) = 19.70$, $p < 0.001$; effect size (φ) = 0.573 (large)

Decision: Reject H_0. There is a statistically significant and fairly strong relationship between the existence of a formal e-waste policy and its perceived effectiveness — institutions and companies that have a known policy are substantially more likely to be seen as managing e-waste effectively.

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5. Objective 4: ESG Awareness, Willingness, and Key Challenges

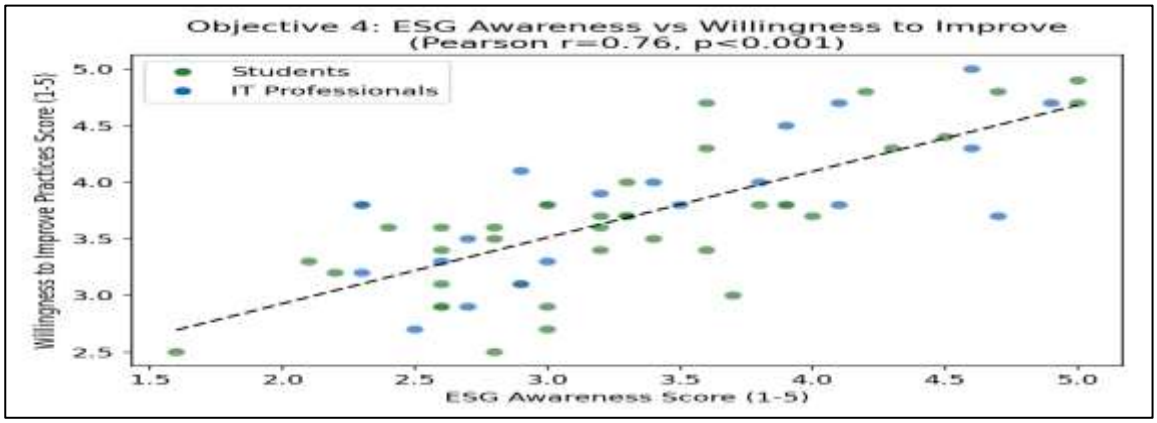

Figure 9: Relationship between ESG Awareness and Willingness to Improve E-Waste Practices

The mean ESG-awareness score was 3.33 (SD = 0.80) and the mean willingness-to-improve score was 3.70 (SD = 0.62), both on a 1–5 scale.

Hypothesis Test – Objective 4

H_0: There is no significant relationship between ESG awareness and the willingness to improve e-waste management practices among respondents.

H_1: There is a significant relationship between ESG awareness and the willingness to improve e-waste management practices among respondents.

Statistical test & result: Pearson correlation: $r(58) = 0.756$, $p < 0.001$

Decision: Reject H_0. There is a strong, statistically significant positive correlation between ESG awareness and willingness to adopt better e-waste practices — respondents with higher ESG awareness are considerably more willing to improve their e-waste behaviour, reinforcing that ESG-oriented awareness campaigns can drive behavioural change.

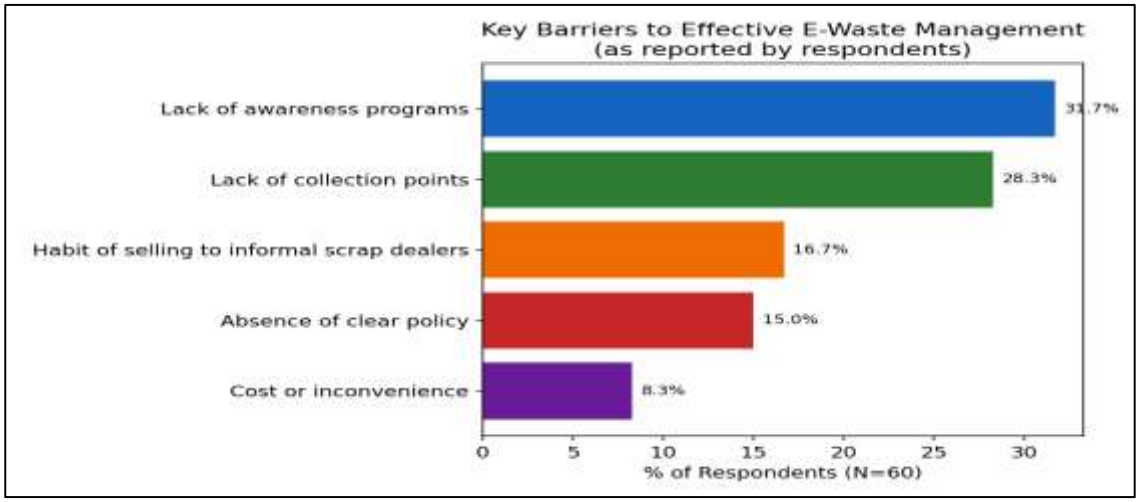

Figure 10: Key Barriers to Effective E-Waste Management (as reported by respondents)

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Lack of awareness programmes (31.7%) and lack of collection points/recycling centres (28.3%) were the two most frequently cited barriers, followed by the habit of selling to informal scrap dealers (16.7%), absence of a clear institutional/company policy (15.0%), and cost or inconvenience of proper disposal (8.3%).

6. Summary of Hypothesis Testing:

Objective	Hypothesis	Test Applied	Result (p-value)	Decision
1. Awareness	H_{01} / H_{11}	Welch t-test	$t(32)=-3.42$, $p=0.002$	H_0 rejected
2. Disposal/Recycling Practice	H_{02} / H_{12}	Chi-square	$\chi^2(1)=0.12$, $p=0.732$	H_0 accepted
3. Policy Existence & Effectiveness	H_{03} / H_{13}	Chi-square	$\chi^2(1)=19.70$, $p<0.001$	H_0 rejected
4. ESG Awareness & Willingness	H_{04} / H_{14}	Pearson correlation	$r=0.76$, $p<0.001$	H_0 rejected

Source-Primary Data

Findings:

- Awareness of e-waste and its harmful effects is high overall (97.5–100%), but awareness of specific hazardous components and authorised recycling channels is comparatively lower, especially among students.
- IT professionals show significantly higher composite awareness of e-waste and its environmental impact than students ($t(32) = -3.42$, $p = 0.002$), likely reflecting workplace exposure to IT-asset disposal norms.
- Despite this awareness gap, actual disposal and recycling practice does not differ significantly between the two groups ($\chi^2(1) = 0.12$, $p = 0.732$) — only 20% of all respondents use an authorised recycler, confirming a clear awareness-practice gap in both groups.
- Storing unused devices at home (30%) and selling to informal scrap dealers (28.3%) are the most common disposal routes, consistent with the informal-sector dominance reported in national literature (Sengupta et al., 2022; Debnath et al., 2022).
- Only 35% of respondents are aware of a formal e-waste policy in their college or company, but where such a policy exists, it is significantly more likely to be perceived as effective ($\chi^2(1) = 19.70$, $p < 0.001$) — policy visibility and communication matter as much as policy existence.
- ESG awareness is strongly and positively correlated with willingness to improve e-waste practices ($r = 0.76$, $p < 0.001$), suggesting that ESG-themed awareness campaigns can meaningfully shift behavioural intent.

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- Lack of awareness programmes and lack of accessible collection points are the two most significant barriers reported by respondents, ahead of cost or policy-related concerns.

Suggestions and Recommendations:

- Colleges should integrate mandatory e-waste and green-computing modules into curricula to close the knowledge gap identified among students.
- IT companies and colleges should set up visible, easily accessible on-site e-waste collection points, since lack of collection points was the second-most cited barrier.
- Institutions with an existing e-waste policy should actively communicate it to students/employees, since policy awareness — not merely policy existence — is what drives perceived effectiveness.
- Regular awareness campaigns (workshops, ESG orientation sessions, social-media drives) should be conducted, given that lack of awareness programmes was the most frequently cited challenge.
- Companies should strengthen Extended Producer Responsibility (EPR) compliance and offer buy-back/exchange schemes to divert devices away from informal scrap dealers.
- Given the strong ESG-awareness – willingness correlation, ESG communication should be framed to emphasise practical, personal benefits of responsible e-waste disposal to convert awareness into willingness and, eventually, action.
- Future studies should track the awareness–practice gap over time with a larger, stratified sample to strengthen generalisability.

Conclusion:

This study examined e-waste management awareness and practices among 60 respondents — 40 students and 20 IT professionals — in Mumbai, through an ESG lens. The findings reveal a significant gap between awareness and practice: while awareness of e-waste is high and significantly higher among IT professionals, actual disposal behaviour remains largely informal and does not differ significantly between the two groups. A clear, communicated institutional policy is significantly associated with perceived effectiveness, and ESG awareness is strongly linked to willingness to improve practices. Lack of collection points and inadequate awareness programmes emerged as the leading barriers. Integrating green-computing concepts and mandatory e-waste training into education, alongside stricter and better-communicated corporate ESG policies, can help translate awareness into responsible action and improve compliance with the E-Waste (Management) Rules, 2022. This research contributes to the ongoing discourse on sustainable IT practices in India and offers actionable recommendations for educational institutions and IT companies seeking to align with ESG goals.

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(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
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IMPACT OF ESG PRACTICES ON FINANCIAL REPORTING: A STUDY OF TOYOTA MOTOR CORPORATION

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Abstract:
Environmental, Social and Governance (ESG) practices have become an important part of modern corporate reporting and financial decision-making. Companies are increasingly expected to provide transparent information about their environmental impact, social responsibilities and governance practices along with their financial performance. This research paper examines the impact of ESG practices on financial reporting with reference to Toyota Motor Corporation, a leading international automobile company. The study covers FY2023 to FY2026, with FY2026 representing the latest completed financial year ended March 31, 2026. Toyota prepares its consolidated financial statements in accordance with IFRS Accounting Standards and publishes Integrated Reports and Sustainability Data Books that provide financial and non-financial information.

The study analyses Toyota's financial performance, ESG disclosures and sustainability initiatives during the selected period. Particular attention is given to environmental initiatives such as carbon-emission reduction, electrified vehicles and renewable electricity; social initiatives relating to employees, safety and human rights; and governance practices relating to transparency, risk management and corporate oversight. The research also examines whether increased ESG disclosure contributes to greater transparency and provides useful information for stakeholders. Toyota's FY2025 Sustainability Data Book reported a 32% reduction in average CO_2 emissions from new vehicles compared with 2010, cumulative electrified-vehicle sales of 31.75 million units, a 34% reduction in CO_2 emissions from global plants compared with 2013, and a 36% global renewable-electricity adoption rate.

The findings indicate that ESG reporting has become increasingly integrated with Toyota's broader corporate and financial reporting. However, ESG performance and financial performance should not automatically be interpreted as having a direct causal relationship. The study therefore evaluates their relationship through comparative analysis rather than claiming direct causation.

Keywords: *ESG, Financial Reporting, Toyota Motor Corporation, Sustainability, IFRS, ESG Disclosure, Financial Performance, Sustainable Finance*

Introduction:

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Environmental, Social and Governance (ESG) practices have become an important component of corporate reporting. Traditionally, financial reporting focused primarily on revenue, expenses, assets, liabilities, profit and cash flows. However, investors and other stakeholders increasingly require information about issues such as climate change, employee welfare, supply-chain responsibility, business ethics and corporate governance.

The automobile industry is particularly relevant to ESG research because its activities are closely connected with carbon emissions, energy consumption, raw materials, batteries, manufacturing, mobility and supply chains. Toyota Motor Corporation provides an appropriate case for studying this relationship because it combines extensive financial reporting with detailed sustainability disclosures.

Toyota's financial reporting is prepared in accordance with IFRS Accounting Standards. Toyota's FY2026 financial results cover the period from April 1, 2025 to March 31, 2026. Toyota also maintains a dedicated sustainability reporting system, including its Sustainability Data Book. The June 2026 update covers environmental, social and governance information and represents the latest sustainability information available from Toyota.

The period from FY2023 to FY2026 is particularly useful because it captures four consecutive years of financial performance and ESG development. Toyota's sales revenue increased from ¥37.15 trillion in FY2023 to ¥45.10 trillion in FY2024 and ¥48.04 trillion in FY2025, before reaching ¥50.68 trillion in FY2026.

At the same time, Toyota continued to develop its environmental strategy. Its FY2025 Sustainability Data Book reported that average CO_2 emissions from new vehicles had been reduced by 32% compared with 2010 and that cumulative electrified-vehicle sales had reached 31.75 million units.

Therefore, this research examines how ESG practices are disclosed alongside financial information and how Toyota's financial performance changed during FY2023–FY2026.

Research Methodology:

Research Design

The study follows a **descriptive and analytical case-study approach** based on Toyota Motor Corporation.

Study Period

The research covers **FY2023 to FY2026**, with fiscal years ending March 31 of each respective year.

Data Sources:

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The study uses secondary data obtained primarily from Toyota's official:

- Integrated Reports
- Financial Results
- Sustainability Data Books
- SEC Form 20-F filings
- Sustainability-related disclosures

Toyota's official investor library provides financial results and Integrated Reports, while its Sustainability Data Book provides environmental, social and governance information.

Variables Studied

Financial variables:

- Sales revenue
- Operating income
- Net income
- Operating margin
- ROA
- ROE

ESG variables:

- CO_2 emissions
- Electrified-vehicle sales
- Renewable electricity
- Employee and social initiatives
- Human rights and supply-chain practices
- Corporate governance
- ESG disclosure and assurance

Method of Analysis:

The study uses:

- Year-wise comparison
- Percentage analysis
- Ratio analysis
- Trend analysis
- Comparative tables
- Graphical presentation

Objectives of the Study:

1. To study Toyota Motor Corporation's ESG practices during FY2023–FY2026.
2. To analyse Toyota's financial performance during the selected period.
3. To examine Toyota's environmental, social and governance disclosures.
4. To study the relationship between ESG reporting and financial reporting.

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5. To analyse changes in Toyota's revenue, operating income, net income and financial ratios.
6. To understand how sustainability-related activities are incorporated into corporate reporting.
7. To identify the importance of ESG information for stakeholders and financial decision-making.

Financial Performance Analysis:

Toyota Financial Performance, FY2023–FY2026

Financial Year	Sales Revenue (¥ million)	Operating Income (¥ million)	Net Income (¥ million)	Operating Margin
FY2023	37,154,298	2,725,025	2,492,967	7.3%
FY2024	45,095,325	5,352,934	5,071,421	11.9%
FY2025	48,036,704	4,795,586	4,789,755	10.0%
FY2026	50,684,952			

Financial Ratio Analysis:

Toyota's official financial-performance data shows the following trend:

Year	Operating Margin	ROA	ROE
FY2023	7.3%	3.5%	9.0%
FY2024	11.9%	6.0%	15.8%
FY2025	10.0%	5.2%	13.6%
FY2026	7.4%	3.9%	10.1%

Interpretation: Toyota's profitability ratios improved significantly in FY2024 but declined during FY2025 and FY2026. FY2026 operating margin was 7.4%, compared with 10.0% in FY2025 and 11.9% in FY2024. ROE also declined from 15.8% in FY2024 to 10.1% in FY2026.

This demonstrates that ESG progress should not be evaluated only through short-term profitability. ESG investments can support long-term risk management, innovation, resource efficiency and resilience even when short-term profitability fluctuates.

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ESG and Financial Reporting

The relationship between ESG and financial reporting can be understood through four areas:

1. ESG Investments

Investment in electrification, renewable energy, research and development and cleaner manufacturing can involve significant financial resources.

2. ESG Risks

Climate change, supply-chain disruption, raw-material availability and regulatory changes may create financial risks.

3. ESG Opportunities

Electrified vehicles, new mobility technologies, energy efficiency and circular-economy initiatives may create new business opportunities.

4. Transparency

ESG disclosures provide additional information to stakeholders beyond traditional financial statements.

Therefore, ESG reporting does not replace financial reporting. Instead, it provides complementary information that can help stakeholders understand the company's long-term risks and opportunities.

Scope for Future Research:

Future studies can:

- Compare Toyota with other global automobile companies.
- Examine ESG ratings and financial performance.
- Study the impact of green investments on profitability.
- Compare Toyota's ESG reporting with IFRS Sustainability Disclosure Standards.
- Study investor perceptions of Toyota's ESG performance.
- Extend the study beyond FY2026 as new sustainability and financial data become available.

ESG–Financial Reporting Relationship Diagram

ESG PRACTICES:

Toyota focuses on carbon reduction, electrified vehicles, employee welfare, human rights, ethical business and corporate governance.

🌱 Environmental

→ Carbon reduction

→ Electrified vehicles

→ Renewable energy

→ Circular economy

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👥 Social
→ Employee welfare
→ Safety
→ Human rights
→ Responsible supply chain
🏢 Governance
→ Internal controls
→ Risk management
→ Ethics
→ Transparency

ESG DISCLOSURES
↓
INTEGRATED / CORPORATE REPORTING
↓
FINANCIAL INFORMATION
Revenue | Profit | Assets | Liabilities | Cash Flow | Investments
↓
STAKEHOLDER DECISION-MAKING
Investors | Customers | Employees | Lenders | Regulators

ESG Disclosures:
Toyota reports its **environmental, social and governance performance** through sustainability disclosures and reports.
Integrated / Corporate Reporting:
ESG information is presented along with **financial and business information**, giving stakeholders a broader view of the company.
Financial Information:
Includes **revenue, profit, assets, liabilities, investments and financial performance**.
Stakeholder Decision-Making:
Investors, shareholders, employees, customers and other stakeholders use this information to make **informed decisions**.
Conclusion:
The study concludes that ESG practices have become an important component of Toyota Motor Corporation's overall corporate reporting framework. During FY2023–FY2026, Toyota expanded its financial and sustainability disclosures while continuing its efforts toward carbon neutrality, electrification, resource efficiency, social responsibility and stronger governance.

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Toyota's financial performance showed substantial changes during the study period. Sales revenue increased from ¥37.15 trillion in FY2023 to ¥50.68 trillion in FY2026. However, profitability ratios did not increase continuously. Operating margin increased sharply in FY2024 and subsequently declined to 7.4% in FY2026.

Suggestions:

1. Toyota should continue improving the integration of ESG information with financial reporting.
2. The company should provide greater quantitative information linking major sustainability investments with financial outcomes.
3. ESG disclosures should continue to use measurable and comparable indicators.
4. Toyota should maintain independent assurance of important sustainability information where possible.
5. Stakeholders should evaluate ESG performance together with financial performance rather than relying on either one independently.

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IMPACT OF ESG AND SUSTAINABLE BUSINESS GROWTH: AN ANALYSIS OF INFOSYS LIMITED

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Abstract:
Environmental, Social and Governance (ESG) has become an important part of modern business management. ESG focuses on how companies manage environmental responsibilities, social development and ethical governance. In the present business environment, organizations are expected not only to generate profits but also to create value for employees, customers, investors, communities and the environment.
Infosys Limited, a leading Indian IT company, has incorporated ESG principles into its business operations and long-term strategy. The company has developed several initiatives related to climate action, renewable energy, green buildings, waste management, employee development, diversity and inclusion, digital education, community development and corporate governance.
During FY2025–26, Infosys reported carbon neutrality for the seventh consecutive year and diverted 99% of its waste away from landfills. Its digital-skilling initiatives also reached more than 15 million people. These achievements demonstrate the company's continuing focus on environmental sustainability and social development. This study examines how ESG practices contribute to sustainable business growth at Infosys through efficient resource utilization, risk management, employee development, innovation and stakeholder confidence. It also considers how responsible governance can support transparency, accountability and long-term business performance.
Keywords: *ESG, Infosys, Sustainability, CSR, Climate Action, Digital Skilling, Corporate Governance, Sustainable Growth*

Background of the Study:

In today's competitive business environment, organizations are expected to achieve financial success while also considering their impact on society and the environment. ESG provides a framework through which companies can evaluate and improve their responsible business practices.

The environmental component deals with climate change, energy consumption, renewable energy, water conservation and waste management. For technology companies, environmental responsibility is particularly important because large

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offices and data-related operations consume significant amounts of energy and resources. Efficient energy use, renewable energy adoption and responsible waste management can help organizations reduce their environmental impact.

The social component focuses on employees, customers, communities, diversity, inclusion and social development. A company's workforce is an important source of innovation and competitiveness. Therefore, employee training, professional development, equal opportunities and employee well-being can contribute to long-term organizational success.

Governance relates to ethics, transparency, accountability, compliance and responsible decision-making. Effective governance helps organizations manage risks and maintain the confidence of investors and other stakeholders.

Infosys has integrated ESG into its business strategy through its ESG Vision 2030. The company has also set a goal of becoming climate positive by 2030. Therefore, Infosys provides a suitable example for understanding how ESG can be connected with long-term business growth.

Purpose of the Study:

The study aims to understand the contribution of ESG practices towards the sustainable development and long-term growth of Infosys Limited. It examines the company's environmental activities, social initiatives and governance systems and considers their possible contribution to operational efficiency, stakeholder confidence and business sustainability.

The study also attempts to understand ESG not merely as a compliance requirement or CSR activity but as a strategic approach that can influence business reputation, employee engagement, innovation, risk management and competitiveness.

Research Method:

Research Approach:

The study follows a descriptive and analytical approach to understand and evaluate the ESG practices of Infosys. The descriptive approach helps explain the company's major ESG initiatives, while analytical methods are used to understand trends and their possible relationship with sustainable business development.

Type of Data:

The research is mainly based on secondary information collected from company reports, publications and other reliable sources.

Major Sources:

- Infosys ESG Reports
- Infosys Integrated Annual Reports
- Infosys ESG Databooks
- Infosys ESG Vision 2030
- Business Responsibility and Sustainability Reports (BRSR)

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- Research papers and academic journals
- Relevant business articles and websites

Study Period:

The analysis covers the period from FY2021 to FY2026.

Analytical Techniques:

The collected information is studied through:

- Comparative analysis
- Percentage analysis
- Trend analysis
- Tables and charts
- Performance evaluation

Since the study is primarily based on secondary data, the findings depend on the information disclosed by the company and other reliable sources.

Objectives of the Study:

Primary Objective

To examine the contribution of ESG practices to the sustainable growth of Infosys Limited.

Supporting Objectives:

1. To examine Infosys' environmental sustainability initiatives.
2. To understand its social responsibility programmes.
3. To study its governance and ethical business practices.
4. To assess the development of its ESG performance.
5. To understand the connection between ESG and sustainable business growth.
6. To examine the role of ESG in building stakeholder confidence.
7. To understand the importance of employee development and digital skilling.
8. To examine how ESG initiatives can contribute to long-term competitiveness.

Literature Survey:

Previous studies have established that ESG has become an important consideration in evaluating corporate sustainability and long-term business performance. Researchers have examined ESG from different perspectives, including financial performance, environmental responsibility, employee welfare, corporate governance and stakeholder relationships.

ESG and Corporate Growth:

Earlier research suggests that companies with effective ESG policies may improve their long-term stability and reduce different types of business risks. Sustainable practices can improve operational efficiency, strengthen corporate reputation and help companies prepare for changing environmental and regulatory requirements. ESG can therefore support long-term value creation when it is properly integrated into business strategy.

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ESG and Stakeholder Relationships:

Research indicates that transparent ESG disclosure can improve relationships with investors, employees, customers and communities. Proper reporting allows stakeholders to understand an organization's sustainability objectives and performance. Investors increasingly consider non-financial information while evaluating companies, making ESG disclosure an important element of corporate communication.

Environmental Responsibility:

Studies have emphasized the importance of renewable energy, energy efficiency, carbon reduction and responsible waste management. Businesses that reduce resource consumption can potentially lower operating costs while also reducing their environmental impact. Environmental sustainability is therefore increasingly connected with operational efficiency and risk management.

Social Responsibility:

Earlier studies have highlighted the importance of employee welfare, diversity, inclusion, education and community development. Organizations that invest in their employees may develop stronger skills and improve employee engagement. Social initiatives can also strengthen relationships with local communities and contribute to a company's reputation.

Corporate Governance:

Research on governance emphasizes transparency, accountability, ethical conduct and effective risk management. Strong governance structures can reduce the possibility of unethical practices and support responsible decision-making. Good governance is also important for maintaining investor confidence and protecting the interests of stakeholders.

ESG in the Technology Sector:

Studies focusing on technology companies indicate that ESG is increasingly relevant because the sector depends heavily on skilled employees, digital infrastructure, energy resources and public trust. Technology companies can contribute to social development through digital education and skill development while also addressing their environmental footprint.

Overall, earlier studies suggest that ESG can contribute to sustainable development when environmental, social and governance activities are integrated with the organization's overall business strategy.

Research Gap:

Although several studies have examined ESG and sustainable development, fewer studies focus specifically on the relationship between ESG practices and sustainable growth in large IT companies. There is a need to understand how environmental

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activities, social initiatives and governance practices work together to support long-term business performance.

Many studies discuss ESG as a broad concept, while limited attention is given to how individual ESG initiatives can support business efficiency, employee development, innovation and stakeholder confidence within a major technology company.

This study therefore focuses on Infosys Limited to examine the practical role of ESG in sustainable business development. It attempts to connect ESG initiatives with areas such as resource efficiency, human capital development, risk management and long-term competitiveness.

ESG Structure of Infosys:

ESG Area	Major Focus	Examples of Infosys Infosys Initiatives
Environmental	Climate, energy and waste	Carbon neutrally renewable energy, green buildings, waste management
Social	Employees, communities and education	Digital skilling, employee development, diversity, CSR
Goverance	Ethics, transparency and compliance	Board oversight, risk management, responsible decision-making

The three ESG dimensions are interconnected. Environmental initiatives help reduce resource-related risks, social initiatives strengthen human and community development, and governance practices provide the framework for responsible implementation.

Major ESG Performance:

Infosys has made significant progress in different ESG areas. In FY2025–26, the company reported carbon neutrality for the seventh consecutive year. It also reported that 99% of its waste was diverted from landfills. Further, 84% of its office area had the highest level of green-building certification.

These environmental achievements demonstrate the company's emphasis on reducing its environmental footprint. Green buildings and efficient resource utilization can contribute to lower energy consumption and more sustainable workplace operations. Waste diversion can also reduce dependence on landfills and encourage responsible resource management.

On the social side, Infosys has focused strongly on digital education and skill development. Its digital-skilling initiatives have reached more than 15 million people,

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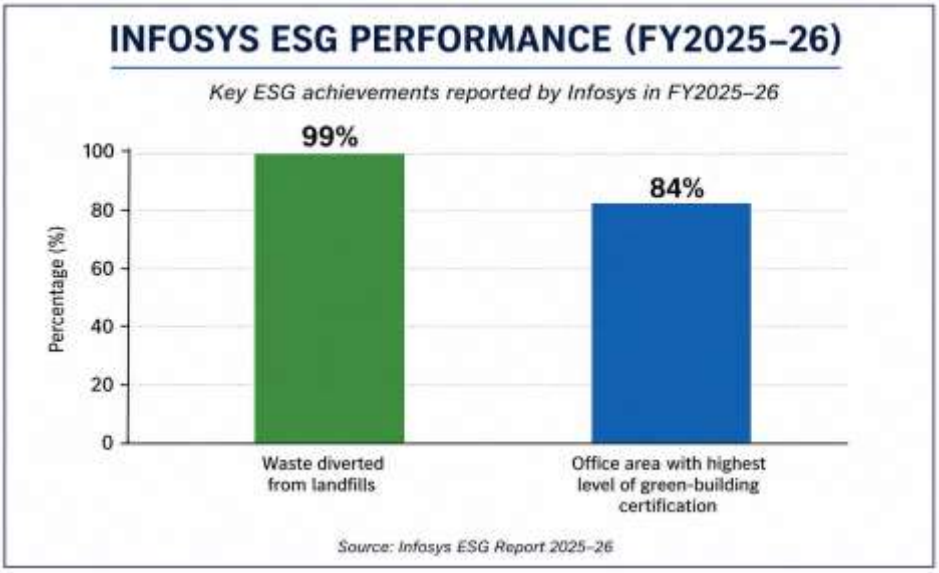
demonstrating the company's contribution towards improving digital capabilities. Digital education can help individuals become more employable and participate more effectively in an increasingly technology-driven economy.

Infosys also emphasizes employee development, diversity and inclusion. Continuous learning is particularly important in the IT industry because technology changes rapidly. Developing employee capabilities can help the organization maintain a skilled workforce and support innovation.

On the governance side, ethical conduct, transparency, compliance and risk management form important elements of responsible corporate management. Strong governance helps create a framework within which ESG commitments can be implemented effectively.

These initiatives indicate that ESG has become an important part of Infosys' overall sustainability approach.



ESG and Sustainable Business Growth:

ESG can contribute to Infosys' long-term growth in several ways.

Environmental efficiency: Energy conservation, renewable energy and waste reduction can support efficient resource utilization.

Employee development: Training, digital learning, diversity and employee welfare can contribute to a skilled and motivated workforce.

Risk management: Strong governance and responsible business practices can help reduce legal, operational and reputational risks.

Innovation: Sustainability-related challenges can encourage companies to develop new technologies and business solutions.

Stakeholder confidence: Transparent ESG reporting can strengthen the confidence of investors, employees, customers and communities.

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Thus, ESG can support both responsible business operations and long-term value creation.

Major Findings:

The study highlights the following findings:

1. ESG has become an important part of Infosys' long-term business strategy.
2. Infosys has maintained its focus on climate action and environmental efficiency.
3. Waste management and green-building practices contribute to environmental sustainability.
4. Digital skilling is one of the major social initiatives of the company.
5. Employee development, diversity and inclusion support the social dimension of ESG.
6. Ethical governance and transparency help maintain stakeholder confidence.
7. ESG practices can contribute to risk reduction and operational efficiency.
8. Sustainable business practices can strengthen the long-term reputation and competitiveness of Infosys.

Conclusion:

The study concludes that ESG practices play an important role in the sustainable growth strategy of Infosys Limited. The company has integrated environmental responsibility, social development and governance into its business approach.

Its environmental initiatives focus on climate action, renewable energy, efficient resource utilization and waste management. Its social initiatives focus on employee development, diversity, digital skilling and community development. At the same time, governance practices support transparency, accountability, ethical conduct and responsible decision-making.

The ESG initiatives of Infosys demonstrate that sustainability can be connected with business objectives. Environmental efficiency can help in responsible resource management, social initiatives can support employees and communities, while strong governance can reduce risks and build stakeholder confidence.

Therefore, ESG should not be viewed only as a CSR activity. It can also act as a strategic tool for creating long-term value, improving competitiveness and supporting sustainable business growth. Infosys' approach shows how a technology company can combine business performance with environmental and social responsibility.

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6. *Infosys – Sustainability Reports*
7. *Research papers and journals related to ESG and sustainable business growth*

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GAP GYAN
A GLOBAL JOURNAL OF SOCIAL SCIENCES
(ISSN – 2581-5830)
Impact Factor – SJIF – 4.998, IIFS - 4.375
Globally peer-reviewed and open access journal.

AI IN PRICING AND PRODUCT RECOMMENDATIONS: TRANSFORMING TRADITIONAL MARKET DYNAMICS

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Abstract:
Artificial Intelligence (AI) is reshaping the way businesses operate, especially in pricing strategies and product recommendations. Traditional markets that relied on fixed pricing, human negotiation, and physical product displays are now influenced by AI-driven analytics, dynamic pricing algorithms, and personalized recommendation systems. This paper, based on secondary research, explores how AI technologies transform traditional market dynamics by enhancing efficiency, consumer engagement, and competitiveness. The study reviews existing literature, analyses the scope of AI adoption, outlines its advantages, and suggests strategies for balancing automation with consumer trust. The findings reveal that while AI offers unparalleled precision in predicting consumer preferences and setting competitive prices, it also poses ethical, employment, and regulatory challenges that need to be addressed for sustainable market transformation.

Introduction:
Traditional markets across industries—retail, services, and manufacturing—have long operated on principles of human intuition, face-to-face negotiation, and standard pricing models. However, globalization, digitization, and rapidly evolving consumer behaviour have pushed these markets toward technological adaptation. Artificial Intelligence (AI) has emerged as a disruptive force, transforming how businesses price their products and how consumers discover, evaluate, and purchase them. Dynamic pricing, once seen only in sectors like airlines and hospitality, is now common in e-commerce and retail. Similarly, AI-based product recommendation engines—powered by machine learning, data mining, and predictive analytics—personalize consumer experiences by suggesting relevant products at the right time. For traditional markets, the integration of such AI-driven tools poses both opportunities and challenges. This research paper examines AI's impact on pricing and product recommendations in traditional markets using secondary data sources, including academic journals, industry reports, case studies, and business articles. The paper provides an in-depth review of literature, outlines the scope of study, highlights the benefits, identifies potential risks, and proposes suggestions for future adoption. Artificial Intelligence (AI) has emerged as one of the most disruptive forces in modern business, redefining the way companies design strategies, engage with consumers, and maintain competitiveness in an increasingly digital marketplace.

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Among its many applications, pricing and product recommendations stand out as two of the most impactful areas where AI is driving change. Through dynamic pricing models, businesses can adjust prices in real-time based on demand fluctuations, competitor actions, and individual consumer behavior. Similarly, recommendation engines powered by AI algorithms personalize the shopping experience by suggesting relevant products, thereby influencing purchase decisions and boosting customer satisfaction.

In traditional markets—where small businesses, local retailers, and established supply chains have long relied on fixed pricing and personal customer interactions—the integration of AI is both an opportunity and a challenge. On one hand, it allows them to compete with large-scale e-commerce platforms by adopting smarter, data-driven practices. On the other hand, limited technological resources and expertise often slow down adoption in such markets. This creates a dynamic shift in market structures, where adaptability becomes a key factor for survival.

The impact of AI in pricing and recommendations is not uniform across the globe. Developed economies, with advanced digital infrastructure, are witnessing rapid AI-driven transformations, whereas emerging economies face barriers such as cost, awareness, and regulatory gaps. At the same time, the growing use of AI raises ethical concerns related to fairness, transparency, and consumer privacy, demanding a balance between technological progress and responsible the study of AI in pricing and product recommendations is critical to understanding how traditional market dynamics are being reshaped. It provides insights into evolving consumer behaviour, business competitiveness, and the broader economic implications of digital transformation.

Review of Literature:

Kotler & Keller (2016) suggest that consumer decision-making is increasingly data-driven, requiring businesses to adapt from mass marketing to personalized offerings. AI facilitates this shift by analysing consumer data in real-time.

Brynjolfsson & McAfee (2017) argue that AI algorithms outperform human intuition in pricing decisions by continuously monitoring demand-supply fluctuations, competitor strategies, and consumer willingness to pay.

McKinsey & Company Report (2020) highlights that personalized recommendations account for 35% of Amazon's sales, showcasing how AI transforms consumer engagement compared to traditional retail methods.

Grewal et al. (2021) emphasize that AI pricing enhances market efficiency but also raises concerns about fairness and consumer trust, particularly in traditional markets with established social interactions.

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Accenture Insights (2022)reveal that companies adopting AI-driven pricing strategies witness 5–10% revenue uplift, while personalized recommendations increase customer retention by 20–30%.

The literature collectively demonstrates that AI provides precision and scale in pricing and recommendations that traditional systems cannot match. However, it raises ethical concerns regarding algorithmic bias, privacy, and the loss of personal human interaction that traditional markets are known for.

Scope of the Study:

Artificial Intelligence (AI) is playing a transformative role in pricing and product strategies across industries. In pricing, businesses are increasingly adopting dynamic and personalized pricing models, which allow them to adjust prices in real-time based on demand, competition, and consumer behaviour. This is particularly evident in sectors like retail, travel, and consumer goods, where flexible pricing strategies enhance competitiveness and profitability. Similarly, AI-powered product recommendation systems are reshaping consumer decision-making by suggesting relevant products and services, thereby boosting sales and customer satisfaction. However, the widespread adoption of these technologies is having a mixed impact on traditional markets. While some small businesses and local retailers are finding ways to adapt by integrating AI into their operations, many struggles to keep pace with the rapid digital transformation, often facing challenges in cost, expertise, and infrastructure. The impact of AI also varies between global and local contexts, as developed economies tend to have higher levels of AI integration, whereas emerging economies experience slower adoption due to limited resources and technological readiness. Alongside these opportunities and challenges, ethical and regulatory concerns remain crucial. Issues of consumer privacy, transparency in algorithms, and fairness in AI-driven decisions highlight the need for responsible implementation, ensuring that the benefits of AI are shared equitably without compromising trust or ethical standards.

Objective of Study:

1. To study the role of AI in transforming pricing strategies in traditional markets.
2. To examine how AI-based recommendation systems influence consumer choices.
3. To analyse the benefits and challenges of AI adoption in traditional markets.
4. To identify ethical and regulatory concerns related to AI-driven pricing.
5. To provide suggestions for integrating AI into traditional markets while retaining consumer trust.

Advantages of AI in Pricing and Recommendations:

- AI offers multiple advantages that are reshaping modern business practices. One of the most significant benefits is the **enhanced consumer experience**, as AI

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enables highly personalized shopping journeys that boost customer satisfaction and loyalty.

- At the same time, businesses can achieve **revenue maximization** through dynamic pricing models that adjust prices in real-time to optimize profit margins. AI also plays a key role in **inventory management**, where product recommendation systems not only promote popular items but also help clear slow-moving stock by suggesting relevant bundles.
- Additionally, AI supports **data-driven decision making**, giving businesses valuable insights into consumer behaviour and allowing for more precise forecasting.
- Importantly, the use of AI enhances **market competitiveness**, enabling traditional businesses and local retailers to stay relevant and compete with large e-commerce giants by leveraging smart technologies.
- Finally, **customer retention** becomes easier through personalization, as customers feel valued when brands anticipate their preferences and needs, thereby fostering long-term relationships.

Recommendations:

AI in Pricing:

- **Dynamic Pricing:** Algorithms adjust prices in real-time based on demand, competitor pricing, seasonality, and consumer trends. Examples: Uber's surge pricing; Flipkart and Amazon's frequent price revisions.
- **Personalized Pricing:** AI predicts a consumer's willingness to pay using demographics, browsing patterns, and purchase history.
- **Predictive Analytics:** Anticipates demand shifts and market changes. Helps reduce losses and maximize opportunities.
- **Traditional Market Adoption:** Slowly penetrating retail, fashion, and FMCG sectors. Small retailers face infrastructure and cost-related challenges.

AI in Product Recommendations:

- Recommendation engines are one of the most important applications of AI in today's market. They work through collaborative filtering, content-based filtering, or hybrid models to analyse consumer data and suggest relevant products.
- In e-commerce, platforms like Amazon, Netflix, and Spotify rely heavily on personalized recommendations to influence consumer choices and boost engagement. Even in traditional retail, physical stores are adopting AI-driven apps and digital kiosks to recommend complementary products, creating a bridge between offline shopping and digital experiences.
- From a consumer psychology perspective, these personalized suggestions reduce the problem of "choice overload," making decision-making easier and increasing the chances of purchase.

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- For traditional markets, this means moving away from static product placements toward more dynamic and personalized engagement with customers, even in offline spaces.
- AI also has a major impact on traditional markets in terms of overall business practices. The shift from human negotiation to algorithm-driven pricing is replacing age-old bargaining methods.
- Success now depends more on data collection and analytics, an area where many small retailers still struggle.
- Local shops face strong competitive pressure from AI-enabled e-commerce giants that offer personalization and efficiency at scale.
- Moreover, consumers who are accustomed to personalized online shopping now expect the same level of service in physical stores, raising the bar for traditional businesses.
- However, these challenges also bring new opportunities. Local retailers who adopt AI-based tools for pricing and product recommendations can modernize their operations, improve customer experiences, and remain competitive in a rapidly changing market landscape.

Suggestions :

1. **Hybrid Approach:** Combine AI strategies with human oversight to ensure fairness.
2. **Transparency in Pricing:** Clearly explain price fluctuations and product recommendations to consumers.
3. **Affordable AI Solutions for SMEs:** Develop cost-effective tools for small retailers to adopt AI.
4. **Consumer Data Protection:** Strengthen cybersecurity and privacy measures.
5. **Government Regulation:** Implement policies ensuring fairness, accountability, and ethical AI use.
6. **Training and Awareness:** Educate traditional retailers on AI's long-term benefits and applications.
7. **Integration with Local Practices:** Adapt AI to cultural traditions, such as bargaining, to enhance consumer trust.

Conclusion:

Artificial Intelligence has become a game-changer in pricing and product recommendation systems, transforming traditional market dynamics. By leveraging data-driven insights, businesses can offer personalized experiences, optimize profits, and stay competitive in a digital-first economy. However, challenges such as ethical concerns, consumer trust, and the digital divide between large corporations and small retailers must be addressed. Traditional markets, known for their human touch and relational dynamics, face both risks and opportunities in adopting AI. The future lies

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in creating a balanced ecosystem where AI enhances efficiency without eroding trust and fairness. Policymakers, businesses, and consumers must collaborate to ensure that AI-driven transformation is inclusive, ethical, and sustainable. In conclusion, AI's role in pricing and product recommendations is not just about automation—it is about reshaping the future of commerce. For traditional markets, the key is not whether to adopt AI but how to adopt it responsibly.

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