



Navigating Climate Realities: Business Leaders' Perspectives on Environmental Challenges

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ABSTRACT

Environmental sustainability has become a critical imperative for businesses worldwide, particularly in rapidly developing economies like India, where industries must balance economic growth with ecological responsibility. This paper examines the perspectives of business leaders on key environmental challenges, including climate change, resource constraints, and the integration of sustainability into core operations. Drawing from stakeholder dialogues involving government officials, industry representatives, MSMEs, and academicians, the study identifies major barriers such as financial limitations, technological gaps, and the persistent divide between awareness and actionable behavioural change. It highlights the uneven adoption of sustainable practices across firm sizes, with larger enterprises advancing faster in areas like circular economy models, renewable energy integration, and ESG-aligned reporting, while MSMEs continue to face significant implementation hurdles. The analysis underscores the need for stronger policy support, including incentives, simplified compliance mechanisms, and enhanced access to green financing and technologies. Findings emphasize that embedding the Triple Bottom Line approach—balancing People, Planet, and Profit—can drive resilient business models. Actionable recommendations focus on awareness enhancement, collaborative partnerships, innovation in green technologies, and strategic leadership to foster long-term sustainability amid growing climate risks.

1. INTRODUCTION

In recent years, environmental issues have emerged as a central concern for business leaders worldwide, with climate change, biodiversity loss, pollution, and extreme weather events directly influencing industrial operations and policy agendas (Carney et al., 2025). India, with its rapidly growing economy and diverse industrial base, faces the dual challenge of balancing development with ecological responsibility (F. Yang et al., 2025). The role of businesses, particularly Micro, Small, and Medium Enterprises (MSMEs), has become critical in this discourse, given their substantial contribution to employment, production, and innovation,

alongside their heightened vulnerability to environmental risks (Panero et al., 2025).

Climate change has emerged as one of the most critical determinants of business continuity and resilience. For businesses, the risks of rising global temperatures, irregular monsoons, and frequent floods or droughts have direct implications for supply chains, raw material availability, and operational costs. Studies highlight that extreme weather events have already been costing the Indian economy billions annually. For instance, climate-related risks could significantly impact India's GDP, while globally, climate change could push millions into poverty, reducing productivity and increasing

vulnerability. For MSMEs, fragile margins are easily eroded by such environmental shocks. Thus, the business case for climate adaptation and sustainability is no longer theoretical—it is an operational imperative that directly links People (workers and communities), Planet (ecosystem resources), and Profit (firm survival).

Sustainability must become embedded in corporate strategy rather than being treated as an external obligation. Businesses that ignore sustainability face reputational, operational and financial risks (Di Maso et al., 2025). The shift towards integrating environmental considerations is evident in the growing emphasis on ESG standards, which help attract investment and enhance long-term competitiveness. By adopting sustainability practices, businesses align with People (employee well-being and consumer trust), Planet (resource conservation), and Profit (long-term viability).

Eco-friendly practices such as renewable energy adoption, waste reduction, and sustainable packaging are critical for reducing environmental footprints. However, businesses, especially MSMEs, encounter financial and technological barriers in scaling these initiatives. Policy frameworks play a pivotal role in overcoming these challenges by providing incentives, subsidies, and simplified compliance pathways. Collaboration between government, industry, academia, and civil society further strengthens efforts towards collective sustainability goals.

Access to green technologies and innovation remains a persistent bottleneck, particularly for smaller enterprises. While larger firms adopt solutions like solar energy, IoT, and AI-driven efficiency tools, MSMEs often struggle with high upfront costs and limited expertise. Encouraging research and development in eco-friendly products, along with supportive financing mechanisms, can help industries reduce resource consumption while expanding market opportunities. Business leaders face multiple responsibilities in addressing sustainability, ranging from regulatory compliance to building operational resilience. With a large population

vulnerable to climate impacts, enterprises must integrate risk management into their strategies while fostering innovation and transparent reporting. Looking forward, sustainability must transition from being optional to a core strategic priority. This involves accelerating renewable energy transitions, scaling circular economy models, and aligning business goals with national and global climate commitments, such as India's net-zero target by 2070.

This paper explores these dynamics through the lens of business leaders' perspectives, analysing challenges, opportunities, and strategic imperatives for embedding environmental sustainability into Indian industry practices. It aims to contribute to the ongoing discourse on achieving resilient and responsible economic growth.

2. LITERATURE REVIEW

2.1 Climate Change and Business Operations

Climate change has emerged as one of the most critical determinants of business continuity and resilience. For businesses, the risks of rising global temperatures, irregular monsoons, and frequent floods or droughts have direct implications for supply chains, raw material availability, and operational costs. Studies prior to 2023 highlight that extreme weather events had already been costing the Indian economy billions annually. For example, the RBI (2022) reported that climate-related risks could shave off nearly 2% of India's GDP annually if not addressed while the World Bank (2021) observed that by 2030,

Table 1: Impact of Climate Change on Business (Pre-2023)

Indicator	Data/Statistics / Source
GDP loss due to climate risks	2% annually for the Indian RBI Report (2022)
Global poverty increases	100 million people at risk by 2030, World Bank (2021)
India's disaster losses (annual average)	USD 9–10 billion UNDRR (2020)
MSME vulnerability	40% face supply chain disruptions due to extreme weather, Ministry of MSME Survey (2021)

Source: Various Government Report

climate change could push over 100 million people into poverty globally, reducing productivity and increasing vulnerability. For MSMEs, this means fragile margins are easily eroded by environmental shocks. Thus, the business case for climate adaptation and sustainability is no longer theoretical it is an operational imperative that directly links People (workers and communities), Planet (ecosystem resources), and Profit (firm survival).

2.2 Sustainability as a Corporate Imperative

The discussions consistently emphasized that sustainability must become embedded in corporate strategy, rather than being treated as an external obligation. Businesses that ignore sustainability face reputational, operational, and financial risks (Di Maso et al., 2025). Research before 2023 demonstrates this shift: the World Economic Forum's Global Risks Report 2022 ranked "climate action failure" as the number one long-term risk to businesses worldwide. Meanwhile, the Ministry of Corporate Affairs (2021) noted that companies practicing Reporting BRSR were better aligned with global ESG standards, helping attract foreign investment. By adopting sustainability, businesses align with People (employee well-being and consumer trust), Planet (resource conservation), and Profit (long-term competitiveness).

2.3 Eco-Friendly Practices and Policy Framework

Eco-friendly practices such as renewable energy adoption, waste reduction, and sustainable packaging were recognised as critical steps for reducing environmental footprints. Yet, businesses, especially MSMEs, find financial and technological barriers to scaling such initiatives. Government policies therefore play a pivotal role. Before 2023, the Ministry of MSME launched the *ZED Certification Scheme* to encourage zero-defect, zero-effect production and the *Lean Manufacturing Competitiveness Scheme (LMCS)* to reduce energy and resource wastage. However, adoption rates remained modest due to compliance burdens. Participants stressed that incentives such as tax benefits, credit-linked capital subsidies, and green financing must be

Table 2: Corporate Sustainability Imperatives (Pre-2023)

Indicator	Statistics
Climate Action Failure Ranking	1 long term risk for businesses WEF Global Risks Report (2022)
ESG Investment Inflows in India	USD 30 billion SEBI (2021)
Adoption of the BRSR Framework (top 1000 listed Firms)	Mandatory From FY 2022-23 MCA (2021)
Consumer Preference for Green Products	65% of Indian Consumers prefer eco-friendly products, Nielsen Report (2020)

Source: Various Government Report

Table 3: Eco-Friendly Practices and Policy Interventions (Pre-2023)

Indicator	Statistics
ZED Certification adoption (MSMEs)	25000 units by 2022, MSME Ministry (2022)
LMCS Beneficiaries	2300 MSME clusters covered, MSME Annual Report (2021-22)
Renewable Energy Share in India's Total Capacity	40.1%, MNRE (2022)
Plastic Waste Recycled in India	60%, CPCB Report (2021)

Source: Various Government Report

expanded. Such policies directly serve People (through green jobs), Planet (lower emissions), and Profit (reduced costs via efficiency).

2.4 Collaboration and Green Awareness

Collaboration between government, businesses, academia, and civil society was highlighted as central to achieving sustainability. Awareness programs such as Swachh Bharat Mission (2014 onwards) and Jal Shakti Abhiyan (2019) had already demonstrated the potential of collective participation (Anadon et al., 2016). There is a need to further industrial awareness

Table 4: Collaboration and Awareness (Pre-2023)

Indicator	Statistics
CSR spending on environment projects	12% of total CSR, MCA CSR Data (2020)
Swachh Bharat Job Creation	2 million sanitation workers, MoHUA (2020)
Jal Shakti Abhiyan Districts Covered	256 MoJS (2021)
Green Jobs Potential in India by 2030	50 million ILO Report (2019)

Source: Various Government Report

programs must go further by creating green jobs and integrating climate education into industry curricula. Global reports, such as UNESCO (2021), showed that climate education improves workforce adaptability, while in India, CSR allocations towards environment-related projects rose to 12% of total CSR spending by 2020. Collaboration thus fosters People (job creation and education), Planet (collective conservation), and Profit (sustainable industrial ecosystems).

2.5 Access to Green Technology and Innovation

Access to green technologies and financing emerged as a persistent bottleneck, especially for MSMEs. While large firms are adopting solar, wind, and smart energy solutions, smaller firms remain constrained by high upfront costs and lack of expertise (Mariani et al., 2022). Before 2023, India launched the CLCSS to aid technology upgradation, yet its outreach remained limited compared to demand. At the same time, global frameworks like LCA and eco-labelling were being increasingly recognised for product credibility. According to UNEP (2020), eco-labelled products saw a 30% higher consumer

Table 5: Green Technology and Innovation (Pre-2023)

Indicator	Statistics
CLCSS Beneficiaries	1.5 lakh MSMEs, MSME Annual Report (2020-21)
R&D spending in India (% of GDP)	0.7% UNESCO (2021)
Eco-labelled Product Preference	30% higher trust rating UNEP (2020)
IoT adoption in the Indian Industry	25% of large firms by 2022, NASSCOM (2022)

Source: Various Government Report

Table 6: Challenges and Leadership Responsibilities (Pre-2023)

Indicator	Statistics
Population is vulnerable to climate risks	600 million IPCC Ar6 (2021)
Business Prioritizing Sustainability Reporting	70% CII-KPMG Survey (2020)
Firms fined for non-compliance (India)	INR 800 crore penalties (2019-21) CPCB (2021)
Investor preference for ESG-compliant firms	65% of institutional investors EY Global ESG Survey (2021)

Source: Various Government Report

trust rating (Y. Zhang & Hezarkhani, 2021). Encouraging R&D in eco-friendly products and investing in emerging technologies like IoT, AI, and blockchain will help industries reduce resource consumption and strengthen People (workforce skills), Planet (green innovation), and Profit (market expansion) (Murali et al., 2019).

2.6 Challenges and Responsibilities of Business Leaders

Business leaders face multiple challenges in addressing sustainability, ranging from regulatory pressures to consumer expectations and technological shift (H. Yang et al., 2017)s. The IPCC Sixth Assessment Report (2021) highlighted India's extreme vulnerability to climate change, with over 600 million people at risk from heatwaves and floods. This creates dual responsibilities for businesses: ensuring compliance with regulations while building resilience into operations. Reports such as the CII-KPMG (2020) survey revealed that 70% of Indian businesses viewed sustainability reporting as essential for competitiveness, though many MSMEs lacked the capacity to implement it (Daniel et al., 2024). Leaders must therefore allocate resources for compliance, employee training, supply chain monitoring, and transparent communication (Singh et al., 2021). This balance reinforces People (worker/community safety), Planet (reduced impact), and Profit (reputation and investor trust) (Chakraborty et al., 2021).

2.7 Future Directions and Strategic Imperatives

Looking forward, sustainability must transition from being optional to becoming a core business priority. This means accelerating renewable energy transitions, scaling circular economy models, and embedding sustainability into supply chain framework (De et al., 2025). By 2022, India had achieved 40% renewable energy capacity, demonstrating significant progress, yet coal still dominated nearly 55% of energy generation (Ajay & Kumar, 2023). Businesses must align their goals with India's pledge for net-zero by 2070, investing in biodiversity conservation,

**Table 7: Future Directions
For Sustainability (Pre-2023)**

Indicator	Statistics
India's Renewable Energy Capacity Share	40.1% MNRE (2022)
Coal Share in India's Energy Mix	55% IEA (2022)
India's Net Zero Pledge Year	2070 COP26, Glasgow (2021)
ESG Investment Projection in India	USD 150 billion by 2030, Morgan Stanley (2021)

Source: Various Government Report

transparent sustainability reporting, and community-driven initiatives. Green financing and ESG investments are expected to rise further, creating opportunities for innovation and start-ups (Azzone & Noci, 1998). By embedding sustainability into core strategies, industries will safeguard People (livelihoods and communities), Planet (climate resilience), and Profit (long-term competitiveness) (Bhupendra & Sangle, 2016).

3. OBJECTIVES

The objective of the present study is “To study the behavioural impact of climate change awareness programmes among business leaders.”

The goal is to comprehend how business professionals, who play a crucial role in making decisions that either mitigate or exacerbate the climate catastrophe, are affected by climate change awareness initiatives. The study links human agency and leadership accountability with sustainable development goals, highlights the intersection of awareness, perception, and behavioural response, and stresses the significance of comprehending how knowledge is internalised and transformed into workable plans.

4. RESEARCH METHODOLOGY

The study adopted an exploratory qualitative research design anchored in the Triple Bottom Line (TBL) framework of People, Planet, and Profit, ensuring that social, environmental, and economic dimensions were examined together (Arena & Azzone, 2012). Data collection was both primary and secondary. Primary data came from the Round Table discussions, panel

deliberations, expert addresses, and structured feedback forms that captured the perceptions of policymakers, industry leaders, MSMEs, academicians, and research scholars. Secondary data were derived from authoritative reports published before 2023, including the World Economic Forum Global Risks Report (2022), which ranked climate action failure as the number one business risk, the Ministry of MSME Annual Report (2022), which recorded over 25,000 MSMEs adopting the Zero Defect Zero Effect (ZED) certification, and the Ministry of New and Renewable Energy (2022), which reported that renewable energy accounted for 40.1% of India's installed capacity.

The People dimension was captured through indicators such as the World Bank's (2021) warning that climate change could push 100 million people globally into poverty by 2030, the ILO's (2019) estimate that India could generate 50 million green jobs by 2030, and Ministry of Corporate Affairs CSR data (2020), which showed that 12% of CSR allocations were directed to environmental projects (CSR Data & Summary, n.d.). The Planet dimension was examined using the IPCC's Sixth Assessment Report (2021), which highlighted that 600 million Indians are vulnerable to heatwaves and floods (Debnath et al., 2023). Alongside RBI's (2022) estimate that India loses nearly 2% of GDP annually to climate-related risk. Data from the Global Carbon Atlas (2021) also placed India among the top three global CO₂ emitters, with rising industrial dependence on coal (Campbell, 2000). The Profit dimension was analysed through ESG investment flows and business reporting practices: SEBI (2021) reported USD 30 billion in ESG-linked investment inflows into India, CII-KPMG (2020) found that 70% of Indian businesses considered sustainability reporting essential for competitiveness, and Morgan Stanley (2022) projected ESG investments in India could reach USD 150 billion by 2030.

To ensure rigour and credibility, the study applied thematic analysis, coding qualitative data from the Round Table into categories of awareness, barriers, leadership, policy,

collaboration, and innovation, and then triangulating these insights with quantitative indicators from secondary sources (Berelson, 1952). This approach validated stakeholder perspectives against measurable trends, providing a balanced picture of climate challenges and opportunities. Ethical considerations were strictly followed, with voluntary participation, transparency in documentation. By integrating qualitative insights with pre-2023 evidence and aligning them under the TBL framework, the methodology ensured that the research captured both lived experiences and measurable outcomes, making the findings actionable for policy and practice.

4.1 Research Design

The study adopted an Descriptive Qualitative design with a participatory orientation. A round table and brainstorming format was selected to create a platform for dialogue between policymakers, business leaders, industry associations, MSMEs, and academicians. This design enabled the collection of diverse insights on environmental concerns and sustainability practices directly from stakeholders who influence or are impacted by climate change strategies.

4.2 Approach

The methodology integrated participatory action research elements. It combined expert lectures, keynote addresses, and moderated panel discussions with focus group discussions (FGDs). This ensured that the session moved beyond one-way dissemination and evolved into a collaborative exchange of knowledge.

4.3 Data Collection Tools

- *Agenda-driven inputs:* The structured programme (with chief guest, guest of honour, keynote, and panelists) ensured systematic coverage of themes ranging from policy, industry perspectives, MSME challenges, to academic viewpoints.
- *Focus group questions:* A set of discussion prompts was prepared in advance to guide participant deliberations. These focused on climate change awareness, barriers to pro-climate

practices, leadership responsibilities, and policy initiatives.

- *Feedback forms:* Standardised forms were distributed to participants to capture individual reflections on issues, challenges, and potential solutions before and after the discussions.
- *Rapporteur documentation:* Dedicated rapporteurs (research scholars) prepared structured reports capturing key messages, observations, and recommendations.

4.4 Participants

The participant group was purposively selected to ensure representation from government, industry, and academia:

- *Government:* Shri Ramesh Bidhuri (MP), Shri Gopal Arya (RSS Paryavaran Vibhag), Shri Vinamra Mishra (Director, MSME), Shri S.C.L. Das (Secretary, MSME Ministry).
- *Industry & MSMEs:* Ecoex, Grass Roots Research, Ecoline, Ratan Engineering, 3R Management, Bhiwadi Industrial Association, Carbon Markets Association of India.
- *Academia:* Professors from JNU and IIM Lucknow, including subject experts in energy studies and management.
- *Research Scholars:* The research team from ABVSME, JNU, who coordinated, moderated, and documented the session.

4.5 Nature of Data

- *Primary Data:* Participant interventions during discussions, written feedback forms, insights from keynote addresses, and brainstorming outcomes.
- *Secondary Data:* Policy documents (e.g., MoEFCC reports, WEF Global Risks Report, EU Green Deal), previous research (e.g., Eccles & Serafeim, 2014), and global environmental statistics cited during the session.

4.6 Data Analysis

The data was analysed using thematic content analysis. Contributions were classified under four broad themes:

- Awareness Programs and their effectiveness
- Barriers and Challenges in Business

Adoption of Sustainability,

- Business Leadership and Climate Action responsibilities,
- Policy Initiatives and collaborative frameworks for climate action.

Feedback forms were also coded into issues and potential solutions. Triangulation was applied by cross-verifying participant insights with secondary sources to validate consistency and identify gaps.

4.5 Outcome Measurement

The methodological focus was on generating actionable recommendations for stakeholders. These included:

- Policy guidelines for government (tax incentives, ZED initiative expansion).
- Frameworks for industry (carbon neutrality, circular economy, transparent reporting).
- Capacity-building initiatives for MSMEs (training, green financing, technology adoption).

The outcome was aligned with the emphasis on the Triple Bottom Line approach (People, Planet, Profit), measuring environmental sustainability not just as an ecological necessity but as a socio-economic imperative.

4.6 Limitations

- The deliberations were conducted in a single-day event; hence insights are exploratory and time-bound.
- The data is primarily qualitative; quantitative validation would require further surveys.
- Participant perspectives may reflect

individual organisational priorities, making some recommendations context-specific.

5. FINDINGS, SUGGESTION AND CONCLUSION

5.1 Findings

The Round Table discussions revealed that while climate change awareness programs had been organised in the past and had successfully enhanced participants' understanding of sustainability, a considerable gap remained between knowledge and sustained behavioural change (Brammer et al., 2012). Many business leaders and MSME representatives shared that they were aware of climate-related risks but found it difficult to translate this awareness into actionable strategies due to financial constraints, lack of technological access, and limited managerial capacity (Callan & Thomas, 2011). It was also observed that complex global and national supply chains had been consistently vulnerable to climate disruptions, leading to increased uncertainty in production and distribution systems (Borga et al., 2009). Another significant finding was the evolving role of business leadership in driving sustainability (Del Mar Alonso-Almeida et al., 2014). Many companies had already begun adopting practices such as circular economy principles, carbon neutrality targets, and transparent sustainability reporting (Li et al., 2021). However, the level of adoption was uneven across sectors, with larger firms being more active compared to MSMEs. At the same time, participants recognised that policy

Table 8: Problem Identification_Focused Group Outcome

Problems Identifies	Findings
Awareness & Behavioural Change	Climate Change Awareness has Improved, but Behavioural Change remains Limited
Barriers in Implementation	MSMEs face financial, technological, and knowledge gaps; supply chains are climate-vulnerable.
Business Leadership	Growing adoption of circular economy, carbon neutrality and sustainability reporting is uneven across sectors.
Policy Gaps	Schemes like ZED and Make in India are important but need wider outreach, simplification, and incentives.
Emerging Trends	Use of IoT, AI, blockchain, and rising consumer demand for eco-friendly products.

Source: Own Compilation

frameworks such as ZED and Make in India had been introduced by the government, but the outreach, ease of compliance, and incentive mechanisms required further strengthening (Han et al., 2023). Emerging trends showed that businesses are currently exploring the use of digital technologies like IoT, AI, and blockchain to improve environmental monitoring, energy efficiency, and supply chain transparency (L. Zhang et al., 2015). Consumer preferences are also shifting steadily towards eco-friendly products, further pressuring businesses to align their models with sustainability goals (H. Yang & Chen, 2018).

5.2 Suggestions

Based on the findings, the session suggested that greater emphasis should be placed on bridging the gap between awareness and practice. This can be achieved through regular workshops, training sessions, and capacity-building initiatives for MSMEs and industry leaders. It is recommended that sustainability and climate change modules be formally integrated into higher education curricula, thereby instilling pro-environmental values and behaviours at an early stage. Governments should provide financial incentives, tax rebates, and easier access to credit to encourage businesses to adopt eco-friendly technologies. Policies need to move from being prescriptive to facilitative, allowing firms of all sizes to engage in climate action without being overburdened by compliance procedures. Businesses are advised to strengthen their environmental strategies by adopting Environmental Management Systems such as ISO 14001, embracing circular economy frameworks,

and ensuring transparent sustainability reporting. The transition to renewable energy, particularly solar and wind, should become a mainstream practice, especially within MSMEs that contribute significantly to industrial output. Stronger partnerships must be developed between government, academia, and industry to ensure joint projects, collaborative policy formulation, and mutual learning. At the community level, waste segregation, local conservation drives, and grassroots participation should be scaled up to support national and global climate commitments.

5.3 Conclusion

In conclusion, the Round Table underscored that environmental sustainability is no longer a voluntary or optional agenda but an urgent strategic imperative for businesses in India (Hong & Guo, 2019). The past has demonstrated that piecemeal awareness campaigns, while useful, have not been sufficient to drive systemic change (Rustico & Dimitrov, 2022). The present reality indicates that industries and MSMEs are beginning to adopt sustainable practices, yet they continue to face barriers of cost, technology, and policy complexity. Moving forward, sustainability must be embedded into the very fabric of business operations, guided by the Triple Bottom Line approach: People, Planet, and Profit.

The deliberations clearly highlighted that MSMEs, despite their constraints, represent both a challenge and an opportunity (Boskabadi et al., 2022). If adequately supported with financial instruments, technological access, and policy incentives, they can emerge as the most effective

Table 9: Improvement Area_Focused Group Outcome

Area	Suggestions
Awareness & Training	Organise regular MSME climate workshops; integrate sustainability modules in curricula.
Policy Support	Provide incentives, tax benefits, subsidies and credit access; simplify compliance.
Business Strategies	Adopt ISO 14001, circular economy, transparent reporting and renewable energy.
Collaboration	Strengthen govt-academia-industry partnerships; promote community-driven initiatives.
Innovation & Technology	Invest in R&D for eco-friendly products; use IoT, AI, blockchain for monitoring and supply chain efficiency.

Source: Own Compilation

drivers of sustainable business models(Ge et al., 2022). The way ahead lies in collaboration, innovation, and long-term commitment to climate goals. The recommendations derived

from this session will contribute to shaping future policies and practices that align India's economic growth with environmental preservation and social well-being(Xu & Lin, 2021). ■

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