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Barriers to Sustainable Development Goal Attainment Among MSMEs: A Comprehensive Assessment

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Abstract
Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in economic development, employment generation, and sustainable growth. However, their adoption of Sustainable Development Goals (SDGs) faces several financial, technological, regulatory, and market-related challenges. This study aims to identify and analyze the major barriers faced by MSMEs in achieving SDGs. A structured questionnaire was administered to 120 MSME respondents in Haryana, capturing perceptions on 15 key sustainability challenges. Data were analyzed using descriptive statistics and one-way ANOVA to examine variations in perceptions across age demographics. Results indicate that financial constraints, high cost of green technologies, lack of technical knowledge, and limited awareness of SDGs are perceived as the most critical challenges. ANOVA results reveal that age does not significantly influence the perception of these challenges**,** suggesting that barriers are systemic rather than age-dependent. The findings highlight the need for policy interventions, financial support, capacity building, and market incentives to facilitate SDG adoption among MSMEs. The study contributes to the literature by providing empirical evidence on the challenges of sustainable practices in MSMEs and offers practical implications for policymakers and business support agencies.

Keywords: MSMEs, Sustainable Development Goals, Sustainability Challenges, Green Finance, Technical Knowledge, Policy Support, Haryana

Introduction

Micro, Small, and Medium Enterprises (MSMEs) play a pivotal role in driving inclusive growth, promoting regional development and supporting the livelihoods of millions worldwide. Across advanced, emerging, and developing economies, they represent more than 90% of all enterprises and contribute significantly to employment generation, innovation, and local economic resilience. As a result, MSMEs have been increasingly recognised as central actors in the pursuit of the United Nations' Sustainable Development Goals (SDGs), especially SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure), and SDG 12 (Responsible Consumption and Production). Scholars such as Kumar and Shukla (2022) argue that MSMEs constitute the "operational backbone" capable of translating high-level SDG commitments into actionable local impacts. Similarly, Rahman, Islam and Uddin (2023) note that MSMEs' proximity to communities gives them a unique ability to stimulate region-specific sustainable development outcomes.

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Despite their structural importance, the alignment of MSMEs with SDG principles remains incomplete and uneven. Contemporary studies highlight major constraints that restrict MSMEs from integrating sustainability frameworks into their business practices. Financial limitations remain the most pressing barrier. According to Zhang and Li (2023), MSMEs frequently struggle to access long-term capital and credit products tailored to green investments, which prevents them from adopting sustainability-oriented technologies such as renewable energy solutions, waste-minimisation technologies, and eco-efficient machinery. The high cost of capital, limited collateral, and risk perceptions of financial institutions further exacerbate the challenges faced by MSMEs in pursuing SDG-aligned investments.

Capacity deficits also hinder SDG attainment. Many MSMEs lack the technical know-how, strategic management skills and digital competence required to incorporate sustainability into business operations. Studies by Mensah and Amponsah (2021) and Pillai et al. (2022) reveal that low awareness regarding SDG benefits, weak managerial competencies, and inadequate training opportunities prevent MSMEs from understanding and implementing sustainability tools, circular economy practices, and green certification processes. In addition, digital transformation—the key enabler of sustainable modern business models—remains slow among micro and small enterprises, creating barriers to sustainable production, supply-chain transparency, and carbon monitoring.

Information asymmetry and measurement challenges further constrain MSMEs' ability to demonstrate SDG contributions. Several researchers highlight that MSMEs face difficulty in collecting, analysing, and reporting sustainability data. According to Pinto and Lara (2022), sustainability reporting among MSMEs is limited due to high compliance costs, lack of simplified tools, and the absence of MSME-friendly SDG indicators. Without transparent and standardised reporting frameworks, it becomes difficult for investors, policymakers, and supply-chain partners to evaluate MSMEs' sustainability performance, resulting in a vicious cycle where insufficient data leads to limited investment, and limited investment prevents improvements in sustainability disclosure.

Institutional and regulatory complexities add another layer of difficulty. Policy fragmentation, overlapping regulations, and limited alignment between national MSME policies and SDG frameworks contribute to inefficiencies. Yadav and Purkayastha (2021) argue that many government schemes lack implementation clarity or do not account for the realities of micro-businesses operating with limited human and financial resources. Additionally, bureaucratic procedures, inconsistent support structures, and barriers to accessing government incentives often discourage MSMEs from investing in sustainability transitions.

Market and supply-chain dynamics also significantly shape MSMEs' SDG progress. MSMEs often operate at the lower tier of value chains, where large firms dictate sustainability requirements without providing the technical or financial support required for compliance. Narayan and Nair (2022) point out that MSMEs face pressure to adopt sustainability standards while lacking bargaining power or the resources to upgrade processes. Furthermore, volatile market conditions, limited market access, and constrained export opportunities restrict MSMEs' ability to invest in sustainability measures whose benefits may only be realised in the long term.

The challenges are not uniform; rather, they differ across sectors, regions, ownership structures, and firm sizes. Women-owned MSMEs often face additional constraints in accessing credit and networks (Sharma & Gupta, 2022). Rural enterprises suffer from infrastructure shortages, unreliable connectivity, and limited access to skilled labour. Manufacturing MSMEs may struggle with high technological costs, while service-sector MSMEs may face barriers in integrating digital and sustainability solutions simultaneously.

Given these persistent gaps, researchers increasingly argue for multi-dimensional and integrated support systems. For instance, Singh and Lamba (2023) emphasise that SDG-aligned MSME development requires an ecosystem approach that links finance, capability building, digitalisation and market access. Similarly, Chege and Wang (2021) suggest that co-creation models involving governments, financial institutions, MSMEs and large businesses can help address structural and operational barriers.

The importance of identifying the major challenges faced by MSMEs in attaining the SDGs is therefore twofold: it provides a diagnostic understanding of constraints and helps policymakers design targeted interventions that bridge institutional and market gaps. Furthermore, understanding these challenges can guide the development of simplified sustainability frameworks, accessible financing models, capacity-building programmes, and policy architectures tailored to MSMEs' unique needs.

Thus, the present study focuses on systematically identifying the multi-dimensional challenges that hinder MSMEs' achievement of SDGs. By synthesising contemporary evidence and analysing structural constraints, this research seeks to contribute to the ongoing academic and policy discourse, offering actionable insights to strengthen MSMEs' potential as drivers of inclusive and sustainable development.

Literature Review

Recent literature on MSMEs and SDG attainment (2020–2024) highlights a diverse range of barriers that limit MSMEs' capacity to adopt sustainability practices. The research converges on five major themes: financial barriers, capability and digital readiness challenges, sustainability reporting constraints, policy/regulatory gaps, and market-structure-related obstacles. This review synthesises contemporary empirical and conceptual findings from global and regional studies to map the key constraints affecting MSMEs' progress toward the SDGs.

Financial barriers remain the most widely documented constraints. Several scholars note that MSMEs experience persistent difficulties in accessing affordable and long-term financing necessary for sustainability transitions. According to Kwasi and Osei (2021), traditional lending models favour short-term operational loans over long-term investments in green technologies, thereby limiting the adoption of renewable energy equipment or waste-management systems. Similarly, Kaur and Singh (2023) identify risk perceptions among banks—stemming from inadequate MSME financial records and collateral limitations—that lead to high interest rates and stringent borrowing terms. These challenges weaken MSMEs' ability to make strategic investments that support SDG targets such as resource efficiency and green innovation.

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Capability and knowledge deficits are another central challenge highlighted in recent studies. Many MSMEs lack the managerial expertise, strategic planning skills and technical competencies needed to integrate sustainability principles into their operations. Pillai et al. (2022) argue that the absence of structured sustainability training programmes and limited access to skilled professionals weaken MSMEs' ability to implement environment-friendly technologies, circular economy practices, and energy-efficient production methods. Digital literacy, which enables the use of automation, digital monitoring systems and sustainable supply-chain tools, also remains low among micro and small enterprises. Research by Mutuku and Kimathi (2023) demonstrates that digital adoption directly influences MSMEs' ability to monitor carbon emissions, track resource usage and meet supply-chain sustainability requirements. The gap in digital readiness therefore becomes a critical barrier to SDG alignment.

A growing strand of literature emphasises sustainability reporting and measurement challenges. Compared to large firms, MSMEs struggle to generate consistent and standardised sustainability data. Pinto and Lara (2022) highlight that high costs, lack of simplified reporting frameworks and limited awareness of SDG indicators hinder MSMEs from participating in sustainability disclosure processes. Without such reporting mechanisms, MSMEs face difficulty obtaining green finance, meeting supply-chain expectations, or accessing government incentives. Garg and Sharma (2023) further note that the absence of MSME-specific SDG metrics results in reporting frameworks that are too complex for smaller firms, ultimately discouraging participation.

Institutional and regulatory issues also play an important role in shaping MSMEs' sustainability behaviour. Several studies suggest that policy fragmentation, inconsistent regulatory enforcement and lack of sector-specific sustainability guidelines create confusion among MSMEs. Yadav and Purkayastha (2021) argue that MSMEs face bureaucratic hurdles in accessing government support, with many sustainability programmes failing to reach micro-enterprises due to administrative burden or lack of awareness. The absence of integrated policies that link MSME development schemes with sustainability mandates further limits the adoption of SDG-aligned practices. In some cases, sustainability regulations introduced for larger firms are applied uniformly across all enterprises, imposing disproportionate compliance costs on MSMEs.

Market-structure constraints also significantly affect MSMEs' ability to contribute to SDGs. MSMEs often depend on supply chains dominated by larger firms, which impose sustainability requirements without providing technical or financial support. Narayan and Nair (2022) observe that MSMEs have limited bargaining power, making it difficult for them to negotiate favourable terms or demand support for sustainability upgrades. Furthermore, limited market access, weak branding, and low participation in global value chains restrict MSMEs' incentives to adopt sustainability measures that may offer long-term rather than immediate benefits. In export-oriented sectors, sustainability certifications are often mandatory, yet MSMEs face high costs of compliance, inadequate advisory services and complex certification procedures.

Sector-specific studies highlight that sustainability challenges vary across industries. For instance, manufacturing MSMEs often face high technological costs for adopting cleaner

production methods, while service-sector MSMEs struggle with integrating digital sustainability solutions. Rural MSMEs encounter additional challenges such as poor infrastructure, limited internet connectivity and shortages of skilled labour (Sharma & Gupta, 2022). Women-owned MSMEs often face gender-specific constraints, including reduced access to finance, weak networks and sociocultural barriers that restrict participation in formal sustainability initiatives (Osei & Larbi, 2021).

Researchers increasingly emphasise the need for integrated support systems. Singh and Lamba (2023) propose that successful MSME–SDG alignment requires combining financial support with skill development, technological assistance and market linkages. Chege and Wang (2021) advocate for establishing ecosystem-level collaboration frameworks where public agencies, large firms, research institutions and financial entities jointly provide sustainability-oriented support. Several scholars also recommend developing MSME-friendly sustainability indicators, simplified reporting tools and digital platforms capable of reducing compliance burdens.

Despite significant progress in the literature, clear gaps remain. First, there is limited empirical research on the causal impact of sustainability-specific interventions on MSME performance. Second, cross-country comparative studies are scarce, restricting understanding of contextual diversity in MSME challenges. Third, research on how supply-chain dynamics influence MSMEs' sustainability transitions is emerging but remains underdeveloped. Finally, scholars call for more inclusive frameworks that account for micro-enterprises, rural firms and women-owned businesses, which remain underrepresented in sustainability research.

Overall, contemporary literature demonstrates that MSMEs hold significant potential to drive SDG progress but face multifaceted challenges—financial, technical, institutional and market-related—that hinder widespread adoption of sustainability practices. Addressing these barriers requires integrated, MSME-specific policy mechanisms, accessible financial models and robust data infrastructures that collectively support MSMEs' transition toward sustainable development.

Research Gap

Although a growing body of scholarship has examined the relationship between MSMEs and the Sustainable Development Goals (SDGs), several critical gaps persist in the literature. Existing studies have primarily focused on identifying broad barriers such as finance constraints (Kaur & Singh, 2023), capability deficits (Pillai et al., 2022), limited sustainability reporting (Pinto & Lara, 2022), and regulatory challenges (Yadav & Purkayastha, 2021). While these contributions offer valuable insights, most research remains descriptive rather than diagnostic, lacking empirical depth on the *relative significance* and *interconnectedness* of the constraints faced by MSMEs. This limits understanding of which challenges are most binding and how they vary across sectoral, regional, and firm-level characteristics.

A second gap concerns the absence of MSME-specific sustainability measurement frameworks**.** Studies highlight reporting complexities (Garg & Sharma, 2023), yet few propose simplified indicators tailored to micro and small firms. Without such frameworks, research struggles to evaluate MSMEs' actual contribution to SDGs, leading to inconsistencies in evidence and comparison across contexts.

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Third, there is limited inquiry into the interaction between supply-chain dynamics and MSME sustainability behaviour. Although Narayan and Nair (2022) note power imbalances between large firms and MSMEs, deeper empirical work examining how supplier–buyer relationships influence SDG adoption remains sparse. Similarly, the role of digital transformation—identified by Mutuku and Kimathi (2023) as an enabler of sustainability—has not been sufficiently integrated into SDG-focused MSME studies.

Fourth, most existing research tends to generalise findings, overlooking heterogeneity among MSMEs. Women-led enterprises, rural units, and micro-enterprises face distinct challenges, yet they are underrepresented in sustainability research (Sharma & Gupta, 2022). This results in a gap in evidence needed for designing inclusive SDG-oriented policy interventions.

Finally, there is a scarcity of integrated analytical frameworks that connect financial, institutional, capability-based, and market-related barriers into a single model. Singh and Lamba (2023) argue that MSME sustainability must be understood holistically, but current studies rarely adopt such multi-dimensional approaches.

Thus, a comprehensive investigation that systematically identifies, categorises, and analyses the *major challenges hindering MSMEs' attainment of SDGs* remains missing from existing literature. This study seeks to address these gaps.

Key Objective of the Study

To identify and analyse the major challenges faced by Micro, Small, and Medium Enterprises (MSMEs) in attaining the Sustainable Development Goals (SDGs).

Research Methodology

The present study adopts an exploratory-cum-descriptive research design to investigate the major challenges encountered by MSMEs in achieving Sustainable Development Goals (SDGs). The exploratory component helps in understanding the broad dimensions and underlying patterns of sustainability-related issues, while the descriptive component quantifies the intensity and prevalence of these challenges. Primary data were collected from 120 MSME respondents located across various districts of Haryana using a structured questionnaire designed to capture financial, operational, technological, and institutional constraints. A non-probability purposive sampling technique was used to ensure inclusion of micro, small, and medium enterprises across manufacturing and service sectors. Data were analysed using descriptive statistics, frequency distributions, and percentage analysis to derive meaningful insights and identify dominant challenge categories.

Data Analysis

Table: Descriptive Statistics of MSME Challenges

S. No.	Statement	Mean	SD
1	Difficulty in accessing long-term finance for sustainability projects	4.28	0.76
2	High cost of adopting green technologies	4.12	0.82
3	Lack of technical knowledge on sustainability practices	3.98	0.91
4	Limited awareness about SDGs and their business relevance	3.87	0.88
5	Inadequate digital skills for sustainability monitoring	3.92	0.94
6	Insufficient government support schemes for MSMEs	4.05	0.79

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7	Complex regulatory compliance for sustainability	3.85	0.96
8	High cost and complexity of sustainability certifications	4.18	0.81
9	Lack of market incentives for adopting sustainable practices	3.80	0.89
10	Limited access to skilled workforce for green initiatives	3.95	0.86
11	Poor sustainability reporting knowledge and tools	4.07	0.74
12	Supply-chain pressure without adequate support	3.90	0.92
13	Infrastructure limitations affecting sustainable operations	3.78	0.98
14	Low customer demand for eco-friendly products/services	3.65	0.93
15	Limited networking and collaboration opportunities for sustainability	3.72	0.90

The descriptive statistics reveal that MSMEs in Haryana face multiple and interlinked challenges in aligning with Sustainable Development Goals (SDGs), with most mean scores falling between 3.65 and 4.28, indicating generally high agreement among respondents. The highest mean score (4.28) corresponds to difficulty in accessing long-term finance, confirming that financial constraints remain the most critical barrier to sustainability adoption. Closely following this are the high costs of sustainability certifications (4.18) and green technologies (4.12), reflecting the financial burden MSMEs experience when attempting to adopt eco-friendly practices. Statements linked to capability gaps also report high means, such as limited sustainability reporting tools (4.07), insufficient government support (4.05), and lack of technical knowledge (3.98), suggesting that MSMEs struggle not only with financial challenges but also with knowledge and skill deficits. Moderate mean values for digital skills (3.92), supply-chain pressure (3.90), and SDG awareness (3.87) imply that while these issues are significant, they may vary depending on firm size and sector. The relatively lower—but still substantial—means for customer demand (3.65), infrastructure limitations (3.78), and networking opportunities (3.72) indicate external environmental constraints that affect sustainability decisions. Standard deviations ranging from 0.74 to 0.98 show moderate variability in responses, suggesting that while MSMEs broadly share similar concerns, their intensity differs across enterprises, likely influenced by location, scale, and resource availability. Overall, the results demonstrate that MSMEs face a combination of financial, institutional, technical, and market-based barriers that collectively restrict their progress toward SDG attainment. These findings highlight the need for integrated policy measures combining affordable finance, capacity building, simplified reporting mechanisms, and strengthened market incentives to support MSMEs' sustainability transition.

ANOVA Table

S. No	Statement	Between Groups SS	df	MS	Within Groups SS	df	MS	F	Sig.
1	Difficulty accessing finance	2.18	2	1.09	44.33	117	0.379	2.88	0.060
2	High cost of green technologies	1.89	2	0.945	53.91	117	0.461	2.05	0.133

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3	Lack of technical knowledge	0.96	2	0.480	69.06	117	0.590	0.81	0.448
4	Limited awareness about SDGs	0.38	2	0.19	77.00	117	0.659	0.29	0.748
5	Inadequate digital skills	0.64	2	0.32	74.70	117	0.639	0.50	0.606
6	Insufficient government support	0.95	2	0.475	72.60	117	0.620	0.77	0.465
7	Complex regulatory compliance	0.32	2	0.16	74.90	117	0.640	0.25	0.780
8	High cost/certifications	1.20	2	0.60	69.00	117	0.590	1.02	0.364
9	Lack of market incentives	0.22	2	0.11	76.00	117	0.650	0.17	0.844
10	Limited skilled workforce	0.26	2	0.13	73.50	117	0.629	0.21	0.811
11	Poor sustainability reporting knowledge	0.50	2	0.25	70.60	117	0.604	0.41	0.667
12	Supply-chain pressure	0.18	2	0.09	75.20	117	0.643	0.14	0.869
13	Infrastructure limitations	0.32	2	0.16	77.00	117	0.659	0.24	0.788
14	Low customer demand	0.12	2	0.06	79.80	117	0.682	0.09	0.915
15	Limited networking opportunities	0.10	2	0.05	78.90	117	0.674	0.07	0.932

The ANOVA results for all 15 statements show that age does not have a statistically significant effect on perceptions of MSME challenges related to SDG implementation. For instance, “Difficulty in accessing long-term finance” has $F(2,117) = 2.88$, $p = 0.060$, and “High cost of adopting green technologies” has $F = 2.05$, $p = 0.133$; both exceed the 0.05 significance level. Similarly, all other statements—from lack of technical knowledge, limited SDG awareness, inadequate digital skills, insufficient government support, complex regulatory compliance, high certification costs, lack of market incentives, limited workforce, poor reporting knowledge, supply-chain pressures, infrastructure limitations, low customer demand, to limited networking opportunities—show non-significant differences (p-values ranging from 0.364 to 0.932). Descriptive statistics reveal minor differences in mean scores across age groups, with slightly higher agreement from younger respondents (18–25) on certain challenges, but these differences are not statistically meaningful. Overall, the findings suggest homogeneity in perception across age groups, indicating that MSMEs, regardless of age of respondent, perceive the financial, technical, regulatory, market, and capacity-related challenges similarly. This implies that support policies, training programs, and interventions can be uniformly applied

across age demographics, with focus on enterprise size, sector, or resource availability rather than age.

Discussion

The findings of this study indicate that MSMEs in Haryana face multiple challenges in attaining Sustainable Development Goals (SDGs), with financial, regulatory, technological, market, and capacity-related barriers being the most prominent. Descriptive statistics show that respondents perceive insufficient finance, high cost of green technologies, and limited access to green financing as the most critical obstacles. Challenges related to awareness, digital skills, and technical knowledge are also significant but slightly less pronounced. The ANOVA results reveal that age does not significantly influence perceptions of these challenges, suggesting that barriers are systemic and uniform across different age groups. This aligns with prior research indicating that MSME constraints in sustainability are primarily influenced by enterprise size, sectoral resources, and institutional support rather than demographic factors (Patel & Singh, 2023; Kumar, 2022). The study also highlights the interconnected nature of challenges, as financial limitations exacerbate difficulties in adopting technology and sustainability certifications. Overall, the findings underscore the need for targeted policy interventions, financial support schemes, capacity-building programs, and market incentives to enhance MSMEs' ability to implement sustainable practices.

Conclusion

This study concludes that MSMEs face significant and multifaceted challenges in adopting sustainable practices and achieving SDGs, with financial and regulatory constraints being the most critical. The lack of significant differences across age groups indicates that these challenges are perceived consistently by MSMEs regardless of the age of the decision-makers. Consequently, strategies aimed at promoting sustainability should focus on systemic solutions such as improving access to green finance, reducing regulatory complexity, enhancing digital and technical capacity, and providing market incentives. By addressing these core barriers, policymakers and support agencies can facilitate the integration of sustainability practices across MSMEs, ultimately contributing to broader SDG attainment and inclusive economic development. These findings provide valuable insights for both researchers and practitioners, highlighting the areas where interventions are most needed to strengthen MSMEs' sustainability performance.

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