The Role of Micro and Small Enterprises in Climate Change Transition – The Brazilian Case

Abstract

Micro and small enterprises (MSEs) play a crucial role in Brazil's economy, accounting for 93% of active businesses, 52% of formal employment, and 42% of the national wage mass. In cities with up to 50,000 inhabitants, MSEs provide about 60% of formal employment and serve as a fundamental buffer against economic crises. However, they are particularly vulnerable to crises that limit people's mobility, such as sanitary and climate-related events. Despite their economic significance, MSEs remain on the periphery of climate transition policies, lacking access to technology, financing, and sustainable market opportunities. This study explores their potential contributions to climate adaptation and mitigation strategies, primarily based on the Ministry of Entrepreneurship, Micro, and Small Enterprises' (MEMP) directives. Furthermore, it proposes a transversal action plan to inform new public policies. The objective of this paper is to present a strategic development path for MSEs to navigate the climate change transition.

The research follows a case study methodology, structured in two phases. The first phase examines secondary data from public sources and academic studies to assess the profile of MSEs, their economic relevance, and their engagement with sustainability.

While awareness of ESG principles is growing, actual implementation remains limited. Findings indicate that most MSEs do not integrate environmental and social management into their business strategies.

Additionally, the study reviews existing public policies addressing sustainability and MSE-specific issues, covering seven ministries, public financial institutions, and agencies to evaluate gaps and opportunities for enhancing policy frameworks. Generally, existing policies to support MSEs in mitigating and adapting to climate change are fragmented.

The impacts of climate change on industries vary significantly by sector and geographic location. Industries reliant on natural resources, such as pharmaceuticals, cosmetics, biofuel production, forestry, and agribusiness, are among the most vulnerable to physical risks. These risks include extreme weather events such as floods, droughts, and landslides, which can compromise the availability of essential inputs.

Beyond physical impacts, climate change also brings significant socioeconomic consequences. Rising raw material prices, driven by scarcity and production challenges, directly affect business competitiveness and operational costs. Damage to industrial infrastructure, disruptions in transportation and supply chains, and interruptions in essential services such as electricity, water, and communication are recurring challenges that compromise both production and distribution.

Businesses of all sizes face these challenges, but micro and small entrepreneurs, with limited capacity to absorb losses, are especially at risk. This necessitates adaptation and resilience strategies, such as supplier diversification, investment in more robust infrastructure, and the adoption of technologies that reduce dependency on natural resources while increasing operational efficiency.

Risks, vulnerabilities, and impacts of climate change exacerbate social and economic inequalities. Land-use changes (48%), agribusiness activities (27%), and energy consumption, particularly in transport (18%), are the primary sources of carbon emissions. This study analyzes risks related to pressures on agribusiness, water resources, energy infrastructure, public health, and biodiversity. Recent climate events have severely impacted agribusiness, the food industry, tourism, and logistics, with effects rippling throughout the value chain.

From a sustainability perspective, the value chain encompasses the entire lifecycle of a product or service. This systemic view includes environmental, economic, and social impact analyses at each process stage. The value chain serves as the foundation for integrating green economy practices, promoting sustainable and low-carbon solutions. By understanding their role within value chains and adopting sustainable practices, MSEs can minimize climate risks while unlocking innovation opportunities and competitive advantages in increasingly demanding markets.

However, MSEs face significant challenges in accessing these markets. High capital requirements, continuous capacity-building, and the need to comply with stringent technical and commercial standards present considerable barriers. Additionally, investors tend to prioritize well-established technologies, making it difficult for MSEs to secure funding for sustainability initiatives.

The study also identifies business opportunities for MSEs in areas such as social impact enterprises, startups, greentechs, circular economy initiatives, bioeconomy, and

entrepreneurship in marginalized communities. Brazil has notable success stories in these sectors, which could serve as models for regional and local sustainable development.

Business models that promote waste reduction are rapidly expanding. Circular economy strategies rethink product lifecycles by prioritizing recycling and minimizing solid waste generation while simultaneously creating markets and fostering innovation.

Social impact businesses aim to generate societal value by addressing inequality, health, education, and social inclusion. These enterprises combine market-driven approaches with measurable social outcomes, resulting in scalable and sustainable solutions.

Startups, traditionally associated with technological innovation, have expanded their scope to incorporate social and environmental dimensions into their operations. Some, known as greentechs, develop technologies that support energy transition, reduce greenhouse gas emissions, and optimize resource use, directly contributing to climate change mitigation.

This new generation of entrepreneurs integrates Sustainable Development Goals (SDGs) into their business models, recognizing sustainability as a strategic differentiator. They consider the entire value chain, from supplier selection to customer and community engagement.

Entrepreneurship in Brazilian peripheries emerges as an alternative to the scarcity of formal jobs, driven by creativity, resilience, and the pursuit of autonomy.

A survey by the Central Única de Favelas (CUFA) reveals that, among Brazil's 17.9 million favela residents, approximately 5.2 million identify as entrepreneurs. However, only 37% have formalized businesses, highlighting structural challenges. The most common ventures include restaurants and snack bars (15%), beauty and health services (10%), and clothing retail (8%). Notably, 72% of these businesses employ at least one qualified professional, indicating opportunities for further development.

Despite these entrepreneurial dynamics generating an estimated R$202 billion annually—placing favelas as the sixth-largest economic entity in Brazil—lack of formalization remains a barrier, limiting access to credit and other business-enhancing resources.

These ventures demonstrate that innovation, social responsibility, and environmental preservation can coexist, enabling business models that address present needs without compromising future generations. In this context, micro and small enterprises play a

crucial role, whether as integral components of sustainable value chains or as catalysts for transformation within their communities.

Entrepreneurship is evolving from being solely an economic driver to a transformative force that creates new opportunities and fosters a fairer, more inclusive, and sustainable future, where economic growth and environmental preservation go hand in hand.

Adopting sustainable and innovative practices, such as energy efficiency and waste management, is essential for mitigating risks and fostering resilience.

Although the study recognizes these emerging entrepreneurial approaches, they do not yet represent the majority of MSEs. To align MSEs with Agenda 2030 and ESG frameworks, the study highlights the need for:

- Climate change-specific education
- Networking to access partnerships, suppliers, and sales channels
- Capacity-building to stay up-to-date
- Access to capital funding
- Policy interventions to facilitate these actions

The second phase of this study involves qualitative research with institutional stakeholders to develop a strategic approach for MSEs in the climate transition, identifying both mitigation and adaptation measures.

This study underscores the importance of integrating MSEs into value chains for a low-carbon economy, reinforcing their role in innovation and resilience-building. The second phase aims to develop a comprehensive strategy incorporating stable policies, financial incentives, and capacity-building programs—all crucial for unlocking the full potential of MSEs in sustainable development. The findings advocate for an inclusive approach that recognizes MSEs as key contributors to climate resilience and economic transformation.

This framework should be developed through qualitative methodologies, including workshops led by the Ministry of Entrepreneurship, Micro, and Small Enterprises (MEMP) in collaboration with government actors.