

AI as a Catalyst for Sustainable SME Growth: Integrating Economic Efficiency with Environmental Goals in Emerging Economies

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Abstract: *In emerging economies such as India, small and medium enterprises (SMEs) act as the foundation for economic growth, contributing significantly to employment and the country's GDP. Yet SMEs face dual challenges: attaining economic efficiency through digital transformation and attaining sustainability targets amidst growing environmental concerns. Artificial Intelligence (AI) has transformative potential, but its adoption in SMEs has been examined mostly from the perspective of cost-cutting and automation with limited consideration for sustainability. The existing research looks at AI adoption for efficiency or sustainability purposes separately, while the integration of AI in delivering sustainability advantage for SMEs receives little attention. Thus, there exists a vital research gap in their integration for a firm's long-term competitiveness. To close this gap, this research proposes SME-AIGEN, a conceptual framework mapping AI adoption levels (Aware → Piloting → Integrated) against green maturity stages (Ad-hoc → Systematic → Certified). The framework identifies four strategic archetypes—Efficiency Seekers, Eco-Improvers, Digital Optimizers, and Sustainable Innovators—and suggests upgrade trajectories with targeted interventions. An integrative literature review methodology is used in this paper. Academic work and policy documents on application of AI in SMEs (predictive analysis, process optimization, and energy management), green practices, and Industry 4.0-driven sustainability in emerging economies have been studied. The findings emphasize the strategic role that AI plays in helping SMEs not merely to survive but prosper in a market that is competitive and driven by sustainability. This pioneering conceptual framework can form the foundation of future empirical studies and policy actions to encourage AI-enabled green transformation in the SME sector.*

Keywords: Artificial Intelligence, Sustainability, SMEs, Emerging Economies, Digital Transformation

