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An Integrated Framework for Identifying Enablers and Barriers of Lean, Green, and Six Sigma Practices Toward Sustainability in Indian Manufacturing

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Abstract: *The increasing globalisation of business and growing environmental and social concerns have compelled corporations to make their business practices more sustainable. In this disruptive market scenario, one possible solution would be to adopt and include sustainable processes and practices to improve operational, environmental, and social performance. To address such issues, manufacturing industries must deploy lean manufacturing, green manufacturing, and Six Sigma strategies. Manufacturing industries can adopt lean, Green and Six Sigma (LG&SS) to improve operational, social, and environmental efficacy. This research focuses on the adoption of integrated lean, green and Six Sigma strategies to achieve sustainability in the Indian manufacturing industry. A literature study was carried out to determine the current state of lean, green, and Six Sigma practices, and responses from Indian manufacturing SMEs were obtained to analyse the level of implementation of strategies and tools. According to an analysis of the literature, integrated LG&SS is considered as an emerging field for Indian academicians since they have published the highest number of research articles. Based on the information acquired from manufacturing SMEs on the extent to which lean, green, and Six Sigma strategies have been adopted, it is clear that six sigma has been adopted poorly compared to lean and green manufacturing strategies. The barriers of the LG&SS were initially analysed due to the poor adoption of the strategies. Based on the literature review, eighteen barriers to implementing integrated LG&SS in the Indian manufacturing industry were identified. The ISM method was used to determine the interdependence of barriers. Additionally, barriers were categorised using the fuzzy- MICMAC method as driver, linkage, autonomous, and dependent. It is found that "weak legislation" is an important barrier to LG&SS adoption in the Indian manufacturing industry, as it is at the bottom of the ISM model. Six barriers were identified as drivers, whereas four were identified as linking barriers.*

Keywords: Lean, Six Sigma, Green Strategy, ISM Approach

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