Engineering Management Strategies for Redeveloping the Carmona Sanitary Landfill into an MMDA Nature's Park: Towards Creating Micro and Small Enterprises (MSEs)

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Abstract

This study examines engineering management strategies for redeveloping the Carmona Sanitary Landfill into the MMDA Nature's Park, with emphasis on integrating micro and small enterprises (MSEs) to support sustainable socio-economic development alongside environmental rehabilitation. As urban areas increasingly pursue landfill-to-park conversions, there is a growing need to align infrastructure redevelopment with strategic management approaches that enable inclusive livelihood opportunities. The study aims to assess the current status of the redevelopment project in terms of physical, ecological, and strategic indicators; determine differences in stakeholder perceptions before and after exposure to a proposed MSE integration framework; examine variations in MSE readiness based on demographic and socio-economic characteristics; and analyze the influence of engineering management practices on the potential for successful MSE creation. A mixed-methods research design was employed, utilizing survey questionnaires administered to local residents, registered entrepreneurs, and MMDA personnel, complemented by key informant interviews. Quantitative data were analyzed using one-sample t-test, paired t-test, analysis of variance, and regression analysis, while qualitative insights were used to enrich the interpretation of results. Findings reveal that the redevelopment project generally meets physical and ecological standards; however, gaps remain in strategic planning and management mechanisms necessary to optimize MSE integration. Significant differences were observed in stakeholder perceptions and enterprise readiness, and engineering management practices were found to significantly influence MSE development potential. The study concludes by proposing a strategic engineering management framework that integrates infrastructure planning, stakeholder engagement, and enterprise support systems to enhance the sustainability and socio-economic impact of landfill redevelopment initiatives.

Keywords: Engineering Management, Landfill Redevelopment, Micro and Small Enterprises (MSEs), Sustainable Infrastructure, Mixed-Methods Research, Strategic Management, Philippines, Southeast Asia