

## Municipal Solid Waste Management in an Unplanned Hill Station in India

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**Abstract :** Municipal solid waste management (MSWM) has unique challenges in hilly urban settlements. Efforts have been taken by municipalities, private players, non-governmental organizations, etc. for managing solid waste by preventing its generation, reusing, and recovering them into useful products to the extent possible, thereby minimizing its impact on the environment and human health. However, there are many constraints that lead to inadequate management of solid waste. Kohima is an unplanned hill station city in the North Eastern Region of India. The city is facing numerous issues due to the mismanagement of the MSW generated. Kohima Municipal Council (KMC) is the Urban Local Body (ULB) responsible for providing municipal services. The present MSWM system in Kohima comprises of collection, transportation, and disposal of waste without any treatment. Several efforts and experimental projects on waste management have been implemented without any success. Waste management in Kohima city is challenging due to its remote location, difficult topography, dispersed settlements within the city, sensitive ecosystem, etc. Furthermore, the narrow road network in Kohima with limited scope for expansion, inadequate infrastructure facilities, and financial constraints of the ULB add up to the problems faced in managing solid waste. This hill station also has a unique system of traditional local self-governance. Thus, shifting from a traditional system to a modern system in implementing systematic and scientific waste management is also a challenge in itself. This study aims to analyse the existing situation of waste generation, evaluate the effectiveness of the existing management system of MSW, and evolve a strategic approach to achieve a sustainable and resilient MSWM system. The results from the study show that a holistic approach, including social aspects, technical aspects, environmental aspects, and financial aspects, is needed to reform the MSWM system. Stringent adherence to source segregation is required by encouraging public participation through awareness programs. Active involvement of community-based organizations (CBOs) has brought a positive change in sensitizing the public. A waste management model was designed to be adopted at a micro-level such as composting household biodegradable waste and incinerator plants at the community level for non-biodegradable waste. Suitable locations for small waste stations were identified using geographical information system (GIS) tools for waste recovery and recycling. Inculcating the sense of responsibility in every waste generator towards waste management by implementing incentive-based strategies at the Ward level was explored. Initiatives based on the 'polluters pay principle' were also explored to make the solid waste management model "self-sustaining".

**Keywords :** municipal solid waste management, public participation, source segregation, sustainable

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