

Exploring Smart Solid Waste Management Practices in Urban Planning: A Literature Review

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ABSTRACT: Innovative approaches to SMART solid waste management (SWM) within urban planning frameworks are required due to the rapid urbanization and rising waste generation. This literature review examines how SMART solid waste management practices are changing, focusing on integrating cutting-edge technologies like the Internet of Things and community involvement for promoting sustainable urban environment. The review identifies key methodologies, technologies, and frameworks currently used in SMART waste management systems, such as using sensors in smart garbage bins and data analytics for waste collection route optimization, by methodically analyzing primary studies published across multiple databases. The results show notable gaps in contemporary technologies, underscoring the pressing need for all-encompassing approaches that improve sustainability and efficiency of waste management. The review classifies research trends, identifies the challenges of implementations, describes new problems, and suggests ways to integrate SMART solutions into urban waste management systems at the policy levels in the future of Khulna City. Urban planners and proponents of universal standards for improving the sustainability and resilience of urban waste management practices in line with global sustainability goals will find important insights in this synthesis.

Keywords: Smart City, Internet of Things, Urban waste, SMART solid waste management, Sustainability and resilience.

A Review on Landfill Site Provision in Land Use Based Urban Area Development Plans

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ABSTRACT: The rising urban population and consequent waste generation intensify the need for sustainable landfill site provision in urban planning. This review synthesizes recent advancements, methodologies, and regulatory approaches to landfill site selection, highlighting the changing landscape of urban waste management. Contemporary planning for landfills employs advanced technologies like Geographic Information Systems, Multi-Criteria Decision Analysis, and fuzzy logic systems that allow the urban planners to evaluate sites based on a set of environmental, social, and economic criteria. Some newer techniques include fuzzy AHP, SVM, and CA-based Markov models, which predict urban growth by offering landfill sites that would be suitable for future expansion. Innovations in sanitary landfill technologies such as bioreactor landfills, augmentation of materials recovery facility, leachate collection system and further reclamation of urban site via landfill mining indicates a great step toward recovering resources and environmental remediation to complement the circular economy. Besides, the reuse of old landfill sites for green spaces is one of the increasing trends, reflecting a holistic approach in the use of scarce urban land in an ecological way. And also, remediation of old landfill site increases the resources recovery which would otherwise have remained locked in the landfill. Despite such development, there are some impediments to progress in reality. Limitations of data, public opposition, and poor integration of sustainability in waste management practices do indicate some critical research gaps. Furthermore, rapid urbanization increases the number of unscientific landfills, particularly in developing countries, because of weak regulatory frameworks and implementation by the authorities, furthermore the frameworks emphasize environmental considerations over socio-economic scenario. Thus, the study addresses these gaps by developing a dynamic participatory planning framework, that balances four pillars of sustainability i.e. ecological (environmental), economical, operational and social sustainability. This review, therefore, provides insight into the ongoing practices and challenges in landfill waste management; hence, it forms a basis for further planning of resilient and sustainable urban landfills in conformity with urban development guidelines.

Keywords: Land use, Urban area plan, Sustainable landfill planning, Urban waste management, Environmental remediation.