

Sustainable Waste Minimization and Management for Smart Cities India: An Industrial Ecology Perspective

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Abstract

In India, population is continuously growing and more citizens are migrating towards major Indian cities from rural areas at a rate of 25-30 people per minutes in search of better livelihood and better life styles. In order to accommodate this massive urbanization, India needs to find smarter ways to manage complexities, reduce expenses, increase efficiency and improve the quality of life. In Union budget 2015-16, Government of India has allocated ₹142 billion (US \$ 2.4 billion) for housing for all and ₹60 billion (US\$ 1 billion) for smart cities project. Ministry of Urban Development has planned to develop two smart cities in each of India's 29 states. Smart cities are necessary tool to drive our cities towards sustainability that facilitate and mitigate climate change, reduce carbon foot print, and minimize the urban/industrial (nearby) waste with their management.

A smart city minimizes the production of waste and reuses the waste as a resource. A near-zero waste society is not only has an environmental rationale, but also a prerequisite of a smart city. This article addresses the waste production and consumption pattern in view of life cycle assessment, waste prevention and the design of processes/products for recyclability to reuse and waste management that involve the economic action of different sectors of a city in industrial symbiotic manner. Over the past decade, the concept of Industrial Ecology (IE) has getting attention of researchers and practitioners in industry, academia, government, and nongovernmental organizations because of giving a major emphasis on environmental management that recognize and deal the complex nature's systems. Thus, a systemic approach towards innovative waste prevention and management could get benefit from a better understanding of the environmental impact of human behavior and the participation in co-developing and co-testing new solution in a city of target, i.e. identify as a smart city.

Keywords: Smart city, Zero-waste, Industrial symbiosis, Waste life cycle assessment, Sustainability.