

CHANGING PERSPECTIVES ON WASTE MANAGEMENT APPROACH

Moving from Health to Wealth and back to Health

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A thriving civilization produces waste as a byproduct of its activities. If this waste is not adequately managed, it can lead to accumulation problems. History has shown that this accumulation of waste can devastate human lives, often resulting in health crises.

The Industrial Revolution in the mid-nineteenth century led to increased urbanization and denser settlements. Despite this, health issues related to waste were fewer and less severe than in earlier periods. Waste problems were mainly addressed for economic and political reasons. In 1860, the British Royal Commission appointed sanitary commissioners in Bengal, Madras, and Bombay to improve health conditions, particularly for their troops. The first Chair of Hygiene was established at Calcutta Medical College in 1865. By 1896, the Indian

Plague Commission highlighted the importance of health and sanitation, requiring Medical Officers of Health to hold a diploma in public health. The School of Tropical Medicine was founded in 1920, followed by the All-India Institute of Hygiene and Public Health in 1932.

Rapid urbanization has increased the roles of engineers and architects in managing housing, infrastructure, and urban planning. Government funding has largely emphasized infrastructure, resulting in more engineers in municipalities and a reduced role for public health officers. Engineering departments now oversee water supply, sanitation, and drainage, while medical officers manage solid waste. In the 1950s, Roorkee Engineering College (now IIT Roorkee) launched its first Master's program in Public Health Engineering, marking a shift towards a reliance on cement, steel, and energy in public health.

Environmental concerns emerged during the 1970s and 1980s, primarily focusing on pollution. Key events like the Bhopal gas tragedy in 1984 highlighted hazard management's importance, and the 1987 Brundtland Commission introduced sustainable development. Experts from various fields joined this movement, driven by the need to protect public health through pollution reduction. In response, India enacted the Water (Prevention and Control of Pollution) Act in 1974 and the Air (Prevention and Control of Pollution) Act in 1981, followed by the Environmental Protection Act of 1986, emphasizing the

management of liquid and air pollution and material handling in industries.

The 1990s marked a significant shift in the focus on climate change and the need to balance economic growth with environmental protection. Experts from various fields—including economics, public policy, law, and social sciences—began contributing to this discussion. Resource economics, circular economy, and fiscal and market-based instruments gained prominence during this time. However, attention to the scientific management of solid waste was largely lacking until the bubonic plague outbreak in Surat in 1994. Even today, solid waste management in India is governed by guidelines and rules, and the country still lacks established standards and performance measurement, unlike the long-standing standards in place for water and air quality over the past fifty years.

The disparity in waste management regulations can be attributed to several factors. Firstly, there is often no direct correlation between health outcomes and solid waste management, unlike the more evident relationships observed with water and air quality. The common belief is that solid waste impacts primarily air and water; therefore, enforcement of water and air emission standards will automatically mitigate the health risks associated with waste, which is not entirely accurate. Additionally, municipalities may experience a delayed response to the accumulation of waste following significant health epidemics. Financial constraints also play a major role, as local governments are primarily responsible for waste management but may lack the necessary funding. Consequently, all these factors have contributed to a slower regulatory

response regarding waste management. The approach to addressing this issue has typically leaned towards neo-environmentalism, where economic considerations, resource efficiency, and private sector involvement are prioritized, emphasising creating "**wealth from waste**".

The private sector has significantly improved waste management in India. Many municipal corporations have formed Memorandums of Understanding (MoUs) utilizing a public-private partnership model. Non-governmental organizations (NGOs) and civil society groups have also contributed by promoting decentralized waste management solutions, sometimes as part of trendy initiatives. The focus of these efforts tends to revolve around financial considerations, payback periods, and long-term contracts. However, discussions on health implications, which were the primary driver of policies and quality standards, have diminished in favour of engineering and economics approaches.

The current waste management approach has overlooked key issues, requiring a health-focused strategy in light of new challenges. While high-tech solutions and informal recycling have addressed some aspects, they often prioritize financial gains, leaving behind unique issues for policymakers in India. Large garbage piles on urban peripheries generate harmful vectors and methane. At the same time, caste dynamics deepen class distinctions and neglect of waste in fewer volumes of rural-urban distinction in waste management practices, placing the waste management burden on the poor. This has led to new diseases impacting humans, plants, animals, and ecosystems. Health concerns related to waste have shifted from isolated outbreaks and epidemics to a

broader spectrum of health issues, which political leaders often underestimate. Recent concerns raised by the National Green Tribunal (NGT) regarding the health impacts of a waste-to-energy plant in Delhi, along with the increasing occurrences of plastics found in blood and tissues, and the bioaccumulation of metals and plastics in the food chain, highlight important issues that warrant careful consideration.

To date, the health benefits associated with waste management have not justified the investments made (and there are not enough studies in the literature to support or refute the claim). Solid waste managem-

ent programs often lack key indicators like cost-benefit ratios or financial evaluations of benefits. However, the effectiveness of these investments can be measured in terms of savings related to human health and productivity. Focusing on **health in waste management** clarifies objectives for engineers and policymakers. Health considerations are as crucial as equipment and infrastructure, leading to a people-centred approach in designing and operating waste systems. Engaging stakeholders such as medical professionals, health workers, educators, women, and social scientists is essential for realizing this vision.

*Please follow this space for strategies on integrating health considerations into waste management.