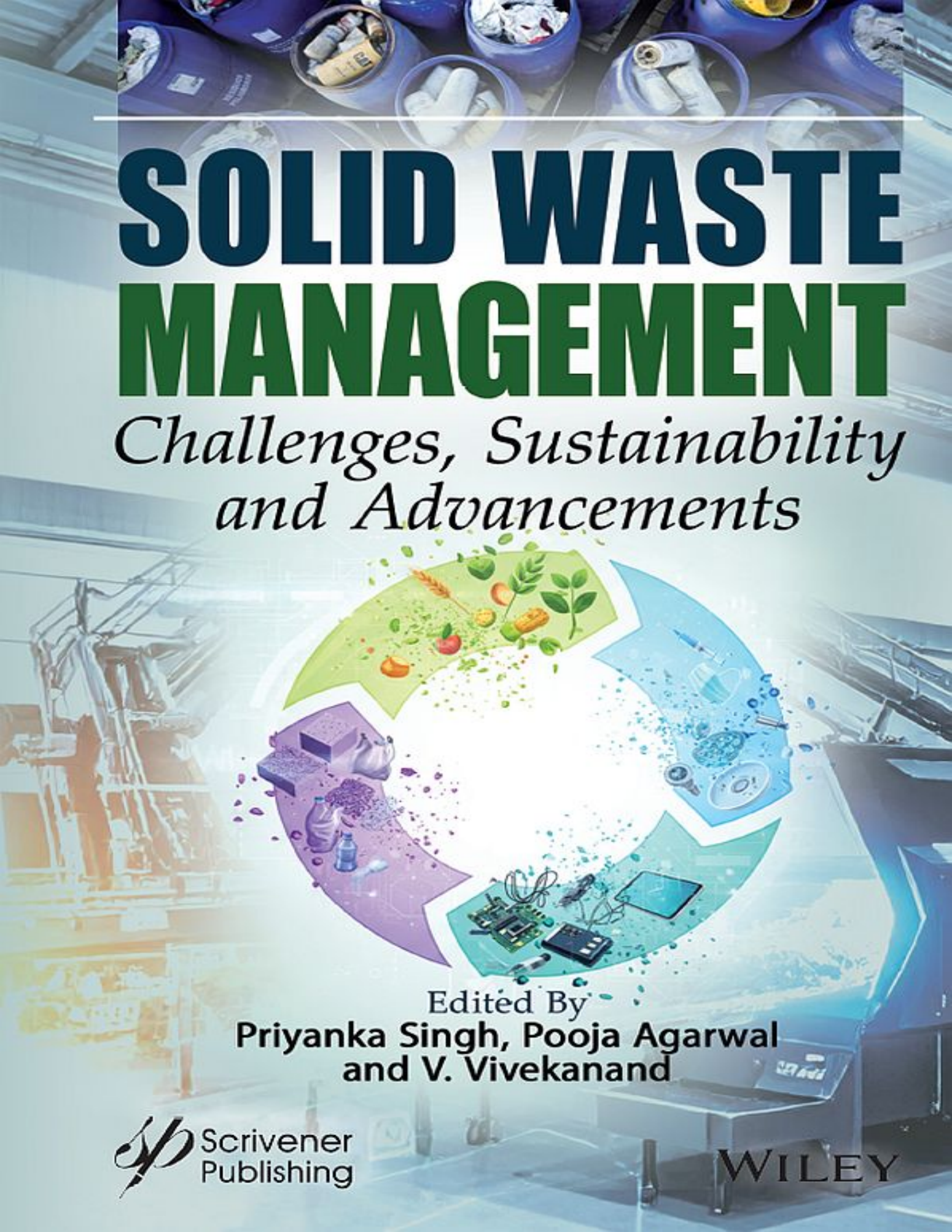


The background of the cover is a collage of images related to waste management. At the top, there are several blue recycling bins filled with various types of waste, including plastic bottles, paper, and food scraps. Below this, there are images of industrial waste processing equipment, such as conveyor belts and large storage tanks. In the center, there is a circular diagram with four colored segments (green, blue, purple, and teal) representing different types of waste: organic food waste, pharmaceuticals, hazardous chemicals, and electronic waste. The title 'SOLID WASTE MANAGEMENT' is prominently displayed in the upper half, with 'SOLID WASTE' in dark blue and 'MANAGEMENT' in green. Below the title, the subtitle 'Challenges, Sustainability and Advancements' is written in a black script font.

SOLID WASTE MANAGEMENT

*Challenges, Sustainability
and Advancements*

Edited By
**Priyanka Singh, Pooja Agarwal
and V. Vivekanand**

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Challenges, Sustainability and Advancements

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Preface

Solid waste products have been continuously generated due to rapid industrialization activities and population growth. These solid waste products mainly include fruit-vegetable waste residue, glass, plastics, metallic electronic items, agricultural waste products. These solid waste products severely affect the environment and health of societal life. The major issues for handling of healthcare waste items have been brought by COVID-19 pandemic situation in the whole world. Policymakers have adopted safety measures for combating these contaminations and applied policies for managing healthcare waste. Therefore, an efficient management system for these solid waste products required appropriate transportation, infrastructure and disposal facilities. The conventional disposal techniques have encountered many challenges of inadequate landfill disposal, inadequate management of hazardous solid waste (like electronic, biomedical, radioactive) and operational inefficiencies of policies. These challenges of waste management systems have been overcome using advance technologies based on predictive models of artificial intelligence (AI) and geographic information system (GIS). Remote sensing along with GIS system has efficiently predicted the nature and trend of waste generation areas using data captured by aerial photography, videography and integrated sensors

This book has compiled all information in the field of solid waste management to provide extensive knowledge to all stakeholders (policy-makers, waste management organizations, researchers, academicians). [Chapter 1](#) explored the several forms of solid waste and challenge due to trash from cities, businesses, electronics, and

construction projects. [Chapter 2](#) has evaluated pertinent organizations and policies for waste management in the world, and provide integrated sustainable management as a solution to the shortcomings. [Chapter 3](#) has investigated legislative framework for biomedical waste management, legislative actions for COVID-19-based biomedical waste (C-BMW), the ability of treatment and disposal facilities to handle challenges, potential management strategies, and perspectives in India. [Chapter 4](#) and [Chapter 5](#) has provided a detailed overview on the use of artificial intelligence, GIS and remote sensing technique for efficient waste management to encourage sustainable development. [Chapter 6](#) has highlighted effective sustainable role of informal waste recycling and modern waste management in developing countries. It described different approaches based on enzymatic, fermentation and valorisation processes for bioconversion of biodegradable waste product into value added industrial products. [Chapter 7](#) has discussed role of cutting-edge technology, interdisciplinary collaborations, and sustainable practices to address the technological, economic, and environmental concerns associated with producing biofuel from biowastes. [Chapter 8](#) has dispensed the planning, extensive research, and collaborative efforts to unleash the full economic potential of halophile-driven biowaste-to-energy projects. [Chapter 9](#) has provided comprehensive information for bioconversion of at waste into a resource for value addition. Waste valorization imbibed the natural recycling principles of zero waste, loop closing, and underlines the importance of sustainable and environmentally friendly alternatives-like fertilizer, wastewater treatment, and biofuel to reduce, reuse, and recycle the waste into composting, anaerobic digestion and vermicomposting. [Chapter 10](#) has highlighted the role of nanotechnology for sustainable waste valorization in agriculture. The transformative potential of Nanotechnology in converting agricultural waste into

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