Preface

The present book deals with the state-of-the-art research studies and technological developments in modeling trends and remediation of solid and hazardous waste management of various categories. **Hazardous waste** is a waste that creates substantial or potential threats to general health of public. Hazardous wastes are defined under RCRA in 40 CFR 261, according to which they have been divided into two major categories as characteristic hazardous and listed hazardous wastes. Characteristic hazardous wastes are materials that are tested for exhibiting four hazardous traits such as ignitability, reactivity, corrosivity, and toxicity. The hazardous wastes are materials listed by the regulatory authorities and connoted as hazardous wastes. These are from nonspecific sources, specific sources, or discarded chemical wastes. The various types of case studies discussed in this book include hospital waste which is an important type of urban waste. The waste from utilization and exploitation of energy resources enhances the heavy metal content and the ambient radiation environment 'Naturally Occurring Radioactive Materials (NORM)'. Procedural aspects for the framing of regulatory mechanism as employed for waste disposal and modeling of solid waste which includes municipal solid waste and the effects of hydrofracking for shale gas recovery is presented. The Non Invasive methods can be used for characterization and monitoring of solid waste and sustainable mineral development, primarily uranium resources for nuclear energy. The book also emphasizes the efficacy of Remote Sensing and GIS for geohazard studies, integrated geophysical methods for hazardous waste management and recent developments in site selection for landfills and innovations in microbial fuels cells.

The adequate protection and restoration of soil ecosystems contaminated by heavy metals require their characterization and remediation. Scattered literature is harnessed to critically review the possible sources, chemistry, potential biohazards, and best available remedial strategies for a number of heavy metals commonly found in contaminated soils. This book would be useful not only for practitioners of Environmental Science and Engineering but also to the readers who are involved in Environmental Planning and Management, preservation of heritage sites, development of suitable healthcare systems, and the practitioners in the framework of

environmental-friendly "Green Technology." The context is of great significance due to the rapid urbanization and the development of smart cities for the growing population in various countries, especially developing countries like India, China, Brazil, South Africa, and Nigeria, to name a few.

In order to visually understand the trends in solid and hazardous waste management, we need the tools of remote sensing and GIS. GIS or geological information system is "location Intelligence" as propounded by the father of GIS Roger Tomlinson (1968). Necessity is the mother of invention. There is a dire need to understand the trends in solid and hazardous waste management for regional planning. This book encompasses the extensive research work by various research groups all over the world to understand the modeling trends in solid and hazardous waste management.

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