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Nota di contenuto	Section I: Smart techniques for waste management -- 1.Waste pollution and management: Current challenges and future perspectives -- 2. Potential of Smart sensors and smart waste bins in smart waste management -- 3. Robotics in waste management: A smart technique to segregate, recycle, and recover electronic waste -- 4. Potential of Radio-frequency identification (RFID) technology in smart waste management -- 5. Role of machine learning and artificial intelligence in smart waste management -- 6. Application of Remote sensing and GIS in effective waste management -- Section II: Ecotechnological approaches for sustainable waste management -- 7. Sustainable management of food waste by composting -- 8. Vermitechnology: A green technology to manage and recover nutrients from municipal waste -- 9. Advanced biotechnological approaches for the management of plastic waste -- 10. Production of green energy from agricultural waste using advanced thermochemical and biological approaches: a step towards circular economy -- 11. Safe disposal and utilization of

fly-ash from municipal waste incinerators for better environmental management -- 12. Biohydrogen production from sewage sludge: Mechanistic insights and factors involved -- Section III: Smart biotechnologies for wastewater management -- 13. Potential of Artificial intelligence in monitoring and predicting effluent quality -- 14. Membrane Bioreactors: A highly advanced biotechnological approach to manage emerging contaminants from industrial wastewater -- 15. Aquatic macrophytes: Role as biomarkers in water pollution detection and as potential agents for removing contaminants from wastewater environments -- 16. Recent advances in enhanced biological nitrogen and phosphorus removal from wastewater -- 17. Potential of nano-biotechnology in remediation of emerging toxicants from wastewater -- 18. Microbial engineering and their potential in remediation of heavy metals from wastewater: Mechanism and factors involved -- 19. Microalgae: A novel low-cost biotechnological approach in detoxification and remediation of radioactive waste from wastewater -- 20. Nano-plastics in wastewater: Monitoring, ecotoxicity and remediation -- 21. Advanced biotechnological approaches for the biodegradation and detoxification of dyes from textile industrial effluents -- 22. Harmful pathogens and pharmaceutical residues: Ecotoxicity and management from wastewater -- 23. Microbial electrolysis: An emerging biotechnology for energy production and wastewater treatment.

Sommario/riassunto

The book provides a detailed overview of major advancements in biotechnological approaches and their application in the remediation of toxic and hazardous contaminants from the environment. It addresses the potential of cutting-edge technologies including smart sensors, smart bins, artificial intelligence, machine learning, robotics, Remote sensing (RS), Geographic Information System (GIS), etc in effective waste and wastewater monitoring and management. It also discusses the role of membrane bioreactors, biofilms, microalgae, microbial engineering, nano-biotechnology, and other bio-techniques in the degradation and detoxification of emerging contaminants like pharmaceutical compounds, heavy metals, harmful pathogens, agrochemicals, antibiotic-resistance genes, nuclear wastes, endocrine-disrupting chemicals and other pollutants that are discharged into wastewaters from domestic, commercial, and industrial sources. In addition, the book evaluates the potential of novel and eco-friendly strategies to effectively dispose of, treat, and manage hazardous municipal, agricultural, and industrial wastes to ensure environmental sustainability and public health protection. This book is a reference for all environmental researchers, scientists, academic faculty, and policymakers who aspire to work in waste and wastewater-related problems and management.