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| Nota di contenuto | Chapter 1. Contribution of Microbial Nanotechnology to Sustainable Development Goals -- Chapter 2. Microbial nanotechnology: a potentially useful tool for environmental sustainability -- Chapter 3. Algal-mediated nanoparticle synthesis for environmental sustainability -- Chapter 4. Sustainable Production of Nanoparticles from Fungi and Their Agricultural Applications -- Chapter 5. Biorefining Agro-Industrial Waste into Green Nanomaterials for Sustainable Agriculture -- Chapter 6. Nanobiotechnology for sustainable food preservations and shelf-life enhancement -- Chapter 7. Eco-friendly production of antimicrobial nanoparticles for sustainability -- Chapter 8. Nano-Biosensors for Detecting Microbial Pathogens in Agriculture -- Chapter 9. Revolutions in Biotic Stress Management and Sustainable Agriculture through microbial-mediated Nanoformulation -- Chapter 10. From Lab |

to Landfill: Exploring Nanobiotechnological Approaches for E-Waste Remediation and Environmental Sustainability -- Chapter 11. Impact of microbial nanobiotechnology on the economy of developing countries -- Chapter 12. Nanotechnology and Microbes: Revolutionizing Water Management -- Chapter 13. Bioengineered Nano-sorbents: Microbial Allies in Pollutant Sequestration -- Chapter 14. Bioremediation of various industrial effluents utilizing microorganism-assisted nanotechnology within a circular economy -- Chapter 15. Microorganism-assisted bionanotechnology for textile dye wastewater treatment.

Sommario/riassunto

Microbial diversity and microbial technology are critical to achieving most of the UN Sustainable Development Goals (SDGs), mainly due to their central role in the provision and regulation of ecosystem services. Despite this intensification of effort, more than 90% of microbial diversity remains to be discovered. Thus, the most unique characteristic of microbial technology is the exceptional diversity of applications it can address and the range of human activities and needs to which it is and can be applied. Separately, nanotechnology and microbiology have produced innovative solutions for human well-being and ecological and environmental equilibrium. The development of interdisciplinary research practices combining nanotechnology and microbiology to deliver creative solutions for human health and environmental and ecological damage is urgently required. The nanotechnology of microorganisms is contributing to the development and innovation of numerous industries. This book will explain the fundamentals and methods of the biological production of nanoparticles from microorganisms, such as bacteria, fungi, and algae. It will describe optimization strategies for microbe-mediated nanoparticle production. The book will also discuss the industrial and agricultural applications of nanoparticles produced by microbes. It also describes the applications of green nanoparticles in the health and pharmaceutical sectors, such as the treatment of multidrug-resistant infections and cancer. Overall, the book focuses on the broad subject areas of microbial nanotechnology and its possible applications in food, pharmaceuticals, water, environmental remediation, etc. However, the lack of information and the potential for negative effects on the environment, human health, safety, and sustainability remain obstacles. This book addresses these issues. Researchers and students in the agricultural sciences, materials sciences, biotechnology, microbiology, and pharmaceutical sectors will find this an invaluable resource.