

Fresh Water Pollution Dynamics and Remediation

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Editors

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 Springer

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To our parents

Preface

Water is the essence of life on earth and totally dominates the chemical composition of all organisms. The ubiquity of water in biota, as the fulcrum of biochemical metabolism, rests on its unique physical and chemical properties. Water ecosystems, specifically freshwater ecosystems, are some of the most important resources that nature has bestowed the planet with. Freshwater ecosystems such as lakes, ponds, rivers, streams, and wetlands are estimated to cover 15% of the world's continental surface area. These inland bodies of water are bastions of biodiversity, hosting about 10% of the world's animals and one-third of all vertebrate species. Freshwater ecosystems are highly valued for their recreational, aesthetic, and scenic qualities, and the water they contain is one of the most treasured of our natural resources. Because of proximity of most of the lacustrine habitats to human settlements, these are prone to anthropogenic pressures which lead to significant decline in their aesthetic, recreational, and aquatic ecosystem functions. Since freshwater is a finite resource, it is easily impacted by complex land and water relationships and human inputs of nutrients, particularly nitrogen and phosphorus, often leading to cultural eutrophication. Preserving the quality and availability of freshwater resources is becoming one of the most pressing environmental challenges on the international horizon. To ensure the preservation of these freshwater ecosystems, there is a need to understand the ecology of the system, pollution problems, their impacts, restoration techniques, and the conservation measures. In this backdrop, the present book, *Freshwater Pollution Dynamics and Remediation*, is in print.

The introductory chapters of the book focus on the present state of the art of the freshwater ecosystems, the pollution status, and the problems associated therewith followed by a thorough discussion about the specific issues pertaining to pesticide pollution, municipal solid waste problems, and climate change impacts.

The book provides an understanding of the changes in the physicochemical characteristics of the water and sediments along with a detailed discussion on the shift in the biological communities including plants and microbes due to pollution. The impact of deteriorating quality of the freshwater ecosystem on the animal and human health is also discussed in detail.

With the increase in the understanding regarding the ecologically unsound techniques that were previously employed for restoration and management of freshwaters, more attention is being paid to ecologically sound and economically viable restoration techniques, prominent among which is bioremediation. This book provides a comprehensive account of the techniques based on updated research on bioremediation, phyto-remediation, and nano-bioremediation along with the role of biomarkers as a remediation tool.

This book can be used as a reference by researchers, scientists, and educators who are involved in the freshwater pollution, remediation, and management studies for gaining an in-depth knowledge regarding the understanding of the freshwater ecosystems, the pollution sources, their impacts, and the ecologically sound economical techniques for remediation and restoration of the system in light of detailed case studies.

The book editors with an expertise in diverse research fields in freshwater ecosystems have congregated the most inclusive research accounts on the freshwater pollution and remediation and thus developed a repository of diverse knowledge on the subject.

Suggestions on the subject are always welcome.

Srinagar, India
Srinagar, India
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Srinagar, India

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Rouf Ahmad Bhat has his specialisation in Limnology, Toxicology, Phytochemistry and Phytoremediation. He has been teaching graduate and postgraduate students for the past 2 years. He is an author of more than 50 scientific articles and 15 book chapters and has published 9 books with international publishers. He has presented and participated in numerous state, national and international conferences, seminars, workshops and symposium and has worked as an associate environmental expert in the World Bank-funded flood recovery project and also environmental support staff in Asian Development Bank-funded development projects. He has received many awards, appreciations and recognitions for his services to the science of water testing and air and noise analysis. He has served as editorial board member

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