

# **MANAGEMENT OF FRESHWATER ECOSYSTEMS**

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## Foreword

Disparity in temporal and spatial distribution of water at regional and global levels especially the freshwater is a common phenomenon. The conventional surface water resources of lentic and lotic nature are convenient sites for human settlement at most places. The subsistence of such human settlement along the water resources or in the catchments areas ultimately influences the water quality in various ways. Reservoirs, lakes and such other water bodies are increasingly facing several challenges due to various anthropogenic factors whereby point and non point sources of aquatic pollution are affecting the water quality. This may be injurious to the health and survival of not only aquatic biota but may also influence the health of people, cattle and wildlife. Apparently such adverse impacts have been vividly seen at many places in our country. This is high time that a consolidated approach is made to have efficient and scientific management of our precious inland surface water resources. To achieve this, there is fundamental need to have better understanding of inland aquatic ecosystems and lakes and reservoirs in particular. The present book is a commendable efforts made in this direction for analyzing the environmental scenario of various aspects related to freshwater ecosystems.

This book is outcome of consistent efforts made by the authors to procure and compile various articles on management of freshwater ecosystems which would be useful to the readers interested in pursuing research and teaching of limnology, hydrobiology and allied aspects. I hope the book will be a valuable asset to libraries and research organizations.

S. Ayyappan

## PREFACE

Water is vital resource for the sustenance of life in general and aquatic life in particular. Major share of water on the planet earth is saline. This stress the need for conserving small fraction of fresh water available for various human uses. Despite the fact that freshwater is more than adequate at global level, its temporal and spatial distribution causes worry for the mankind.

Surface water in the form of lakes, reservoirs and, such other water bodies are indeed life support systems. These are repository of valuable genetic material in the form of various types of aquatic flora and fauna. However, due to use, misuse and all time abuse this precious natural aquatic resource is polluted. Such pollution threatens the survival of aquatic biota and also causes public health hazards by way of dreaded types of water borne diseases. Human intervention into inland waters in various forms create problems of silting, eutrophication, weed menance, anoxia, algal blooms and such water quality related problems. In the modern era of science and technology these issues can not be neglected in view of the fact that fresh water is becoming an important commodity. Considering this, there is a strong need for pursuaing sound management measures for the sustained use of surface water resources.

In this book, the authours have tried to compile useful contributions related to fresh water ecosystems with prime objective for their management. We are grateful to all the contributors for their sincere effort in this direction. The authors are also indebted to Dr. S. Ayyappan, DDG(Fisheries), ICAR and the Uniiversity administration for their kind encourangement.

7<sup>th</sup> January, 2008

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## **ABOUT THE BOOK**

Water is elixir of life. Surface waters in the form of seasonal and perennial resources such as, lakes, reservoirs, rivers and canals are vital for the sustenance of life. With increasing human population, the pressure on these precious resources is also increasing due to anthropogenic factors of various kinds. Such diverse human intervention into inland ecosystems many a times causes irreparable loss to these ecosystems with particular reference to valuable aquatic biota including fish fauna.

In order to facilitate scientific management of lakes, reservoirs, rivers and such other surface water ecosystems, it is inevitable to have precise understanding of the intricacies of these lentic or lotic ecosystems. Based on limnological investigations only, suitable scientific strategies can be developed and implemented for efficient management and conservation of freshwater ecosystem in a holistic manner.

The present book is a humble attempt in this direction for compiling useful information on different basic and applied aspects of freshwater ecosystems for the benefit of readers. The subject of managing freshwater ecosystems is gaining increasing attention in view of the increasing importance of water for multiple uses and at the same time to save these resources from problems of pollution, eutrophication etc. The book comprises carefully selected topics on various aspects of aquatic ecosystems and their management with particular emphasis on freshwaters. This publication would hopefully generate adequate attention at various levels for further enhancement of scientific and technical inputs for management of freshwater ecosystems.

## **ABOUT THE AUTHORS**

**Dr. L.L. Sharma** (Associate Professor and Head, Department of Aquaculture, College of Fisheries, MPUAT, Udaipur) passed his M.Sc. (Zoology) in First Division with specialization in Limnology & Fisheries in 1973 from M.L.S. University, Udaipur and did his Ph.D. in 1980 on "Limnological aspects of Udaipur waters in comparison to selected waters of Rajasthan" from the same University. He has been an active scholar as a teacher and researcher in the field of Environment and Aquatic Ecology for the last over 30 years and has contributed 70 research papers and 33 popular articles on different aspects of aquatic ecology, fisheries and environment in reputed journals. Dr. Sharma has been closely associated with the research projects sponsored by the D.S.T. (New Delhi and Jaipur), UNICEF, DOD, ICAR and Department of Environment (Jaipur) and DAE (BRNS). Dr. Sharma is an active member of several NGO's and academic associations. He has visited Sri Lanka, Denmark, Germany, Netherlands and Japan for attending seminars, symposia and environmental activities. Dr. Sharma has been pursuing research on various aspects of Limnology, Inland aquaculture, Aquatic pollution, Aquatic Biodiversity, Thermal Ecology and Conservation of Lakes.

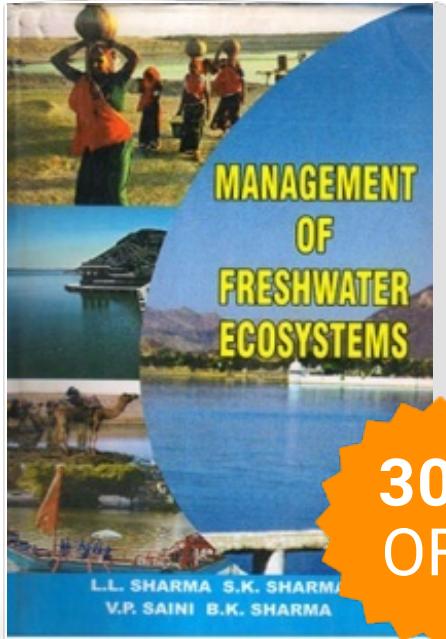
**Dr. Subodh Kumar Sharma** (Assistant Professor, COF, MPUAT, Udaipur) passed his M.Sc.(Ag.) and Ph.D. in Limnology and Fisheries (1992) from Rajasthan Agricultural University, Bikaner. Dr. Sharma has more than 15 years experience of teaching, research and extension work. He has also served Rajasthan Agricultural University, Bikaner and Indira Gandhi Agricultural University, Raipur, Chhattisgarh. He has guided two Ph.D. and five M.Sc./M.F.Sc. research work as Major Advisor. Dr. Sharma has conducted one contractual research project and carried several training programmes. He has more than 15 research papers, 27 extension articles, two edited books, practical manuals and contributed chapters in Books. Dr. Sharma is presently pursuing research and

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# Management of freshwater ecosystems



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