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Introduction to ENVIRONMENTAL SCIENCES

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Preface

Natural environment is made up of complex multiple variables and substances. Man's ceaseless pursuit to improve technology has added up only to the overall complexity. Many a time man has surpassed and failed the nature's restorative capabilities and in due course environmental problems magnify and are scaled up from local to global levels. Environmental science attempts to integrate and realign all the known technology and sciences, arts and management to solve environmental issues. As environmental science became a converging domain for many disciplines, many of the available textbooks on environmental topics are too specialized, which is excellent for their purpose but found difficult for the introductory level students. *Introduction to Environmental Sciences* attempts to cover all the necessary fundamental aspects of the course in an introductory level to fulfil this purpose. All the contributors of this book are, or have been, actively engaged in teaching the subject areas of their specialization in different universities, higher research institutions and colleges in the country.

This book is intended for all students taking an introductory level of environmental sciences and its allied courses. The book may also appeal to all the undergraduate students, in both technical and general streams, for their compulsory course work in environmental studies. Other intended audience of the book may include environmental instructors, both in colleges and in higher education, and professionals engaged in the environmental management, community health practice, extension works, to mention some.

This book contains 18 chapters. Chapter 1 starts out with the scope and relevance of environmental sciences in the modern times. Chapter 2 gives an insight into the various chemical processes operating in environment. Chapter 3 underlines the importance of statistical tools in environmental studies and interpretation. The fourth chapter highlights the essential environmental laws in India. Chapter 5 explains the concept of sustainability science. Chapter 6 focuses on restoration ecology of degraded environments. Chapters 7–12 cover pollution studies, monitoring and analysis and demography. Chapters 13 and 14 are devoted,

respectively, to forest resources and management and understanding wildlife and wilderness as an important factor for maintaining ecological balance. Chapter 15 deals with environmental impact assessment and environmental planning. Chapter 16 highlights the importance of environmental education in mass awareness and resources conservation. Chapter 17 is devoted to natural and human-made disaster and their management. The final chapter discusses greenhouse gases emission and global warming.

The hallmark features of the book are its comprehensive and balanced coverage of the entire syllabus for introductory level students. The book combines the latest knowledge of the subject matter in an easy-to-learn format for rapid and logical comprehension to key environmental issues. The book covers topics such as biostatics, principles of analytic methods, disaster management, and so on, generally omitted in other books. Analysis manual for water and soils have also been incorporated in the book.

We are very grateful to all the authors for their contribution.

Any suggestions, valuable comments, and constructive criticism from readers towards further improvement of the book shall be welcomed.

R.S. Khoiyangbam
Navindu Gupta

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We are also grateful to Dr. S.L. Mehta, former DDG (Education) ICAR and Vice-Chancellor MPUAT, Udaipur, Rajasthan, for sharing his rich experience and insights and also providing guidance and encouragement in the preparation of this long-awaited book on the subject.

R.S. Khoiyangbam
Navindu Gupta

Foreword

Existence of life depends on the most abundant resources of the planet—land, air, and water. But the world is faced with one of the most paradoxical situations in its history—feeding the burgeoning population while conserving the resources for consumption by the present population has been predicted to be unsustainable. Undoubtedly, the development, both industrial and agricultural, especially in the twentieth century, has very adversely impacted the environment. Expectedly, 'environment' rather than 'development' has taken centre stage, at the both national and international levels. But it is, indeed, heartening to see the world sensitized to the twin dangers of the climate change and loss of biodiversity, which are threatening the very existence of mankind. Many international conventions, summits and treaties, which have been organized during the last decade, have received unprecedented attention not only of the world leaders but also of the common man. Global climate change is a reality: opinions may differ on the magnitude and disastrous forecasts but not on its adverse impacts on flora and fauna. Admittedly, in the name of development irreparable damage has been done to the environment and, needless to emphasize, anthropogenic activities harming the environment have to be minimized; new technologies and production systems should be, to the extent possible, environmentally sustainable. Awareness about the environmental issues at all the levels, education (right from early schooling), research and policy matters, is required. Environmental sciences have to be given due importance in educational and research establishments all over the world but there is dearth of good books and journals in the field.

The book *Introduction to Environmental Sciences* by R. S. Khoiyangbam and Navindu Gupta is very timely and well-conceived publication; it covers almost all important areas of the vast subject. The need of such publication has been felt since long, especially, to cater to the curricular requirements of educational and research institutions to impart basic knowledge in the environment sciences in accordance with the modern trends. The hallmark of the book is its comprehensive and balanced coverage of the entire syllabus for the introductory as well as the advanced level students. Most of the chapters have been contributed by renowned experts in their fields. The book combines the latest knowledge of the subject matter in an easy-to-

learn format for quick and logical comprehension of the key environmental issues; it also covers topics such as biostatistics, principle of analytical methods, disaster management, and environmental management system which rarely find place in other books on the subject. Analysis manual for water and soil have also been incorporated in the book.

I am sure the book will be of great help not only to the students, teachers, and researchers but also to the professionals and policy-makers.

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