Environmental Challenges and Solutions 3
Series Editor: Robert J. Cabin

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Biodiversity for Sustainable Development

Springer

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Environmental Challenges and Solutions

Volume 3

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Aims and Scope

The *Environmental Challenges and Solutions* series aims to improve our understanding of the Earth's most important environmental challenges, and how we might more effectively solve or at least mitigate these challenges. Books in this series focus on environmental challenges and solutions in particular geographic regions ranging from small to large spatial scales. These books provide multidisciplinary (technical, socioeconomic, political, etc.) analyses of their environmental challenges and the effectiveness of past and present efforts to address them. They conclude by offering holistic recommendations for more effectively solving these challenges now and into the future. All books are written in a concise and readable style, making them suitable for both specialists and non-specialists starting at first year graduate level.

Proposals for the book series can be sent to the Series Editor, Robert J. Cabin, at cabinrj@brevard.edu

More information about this series at http://www.springer.com/series/11763

Foreword

The year 2015 is considered as a landmark in recent past where a series of multilateral agreements were agreed to by the member states of the United Nations: the Addis Ababa Agenda for Action (AAAA), the 2030 Agenda for Sustainable Development including a series of sustainable development goals (SDGs), and the Paris Climate Accord that have heralded a new enthusiasm, globally, to focus on shaping our common future more sustainably.

For reasons unclear, governments and policy makers are still unable to suitably consider the foundations of such development – the natural capital – appropriately in designing national policies to deliver in the 2030 Agenda for Sustainable Development.

This publication comes at a time to provide a breadth of experiences and options for practitioners and policy makers on issues of conservation and development focusing on issues such as green growth, poverty reduction using natural capital, food security, biodiversity governance, and sharing of benefits of conservation and access equitably.

The authors as well as the editors of this important volume have taken pains to put on papers with a range of issues that need to be considered, especially in India, to effectively realize and promote issues of conservation for development. This is very welcome since India's quest for sustainable development seems to be unprecedented now with a clear focus on getting the GDP numbers move toward an upward spiral.

The papers, carefully compiled across a series of themes, clearly outline the fact that actions on the ground abound, but the gap is to link the actions to delivering the policy and legal mechanisms in the country. This certainly is a cause for worry.

With the enormity of institutions and experts working on issues of development and conservation, this kind of compilation will go a long way to link the science-policy interface where conservation, social sciences, economics, and welfare need to be appropriately linked.

The need to bridge the gap of global and national indifference based on a narrative of competition to grow at the cost of environmental management is more crucial now than before. The nominalism dealing with environmental and development

issues needs to be reversed, using the options and models cited in this volume with chapters that were discussed and debated thoroughly during the National Biodiversity Congress held in 2015.

If we want to secure the political agenda of sustainable development, the base has to be built on appropriately managing and using our natural capital. There should be no second thought!

Division of Environmental Law and Conventions
UNEP, Nairobi, Kenya
February 2016

Balakrishna Pisupati

Preface

Biodiversity and ecosystem services are central to sustaining life on Earth and play an important role in realizing sustainable development goals. India, a megadiverse country with only 2.4 % of the world's land area, harbors 7–8 % of all recorded species including over 45,000 species of plants and 91,000 species of animals. At the same time, India, with 17 % of the world's population and 15 % of the global cattle population, faces severe pressure on land. About 50 million people are directly dependent on forests for their subsistence. The transition path to sustainable development, meeting the aspirations of 1.25 billion people in India, will require decoupling socioeconomic development from the unsustainable use of bioresources. Poverty eradication is the greatest challenge to India as 48 % of Indian children are stunted due to chronic undernutrition. Conserving the diversity of crop plants for food and nutritional security and sustainable livelihood forms the core section of this book. The book aims to explore the three pillars of sustainable development – economic, social, and environmental – and its interlinkages at the regional level for a sustainable consumption pattern. The section on access and benefit sharing (ABS) with chapters contributed by experts in the field focuses on the Nagoya Protocol and its key provision on the equitable sharing of benefits leading to improved local economies, livelihoods, and the sustainable utilization of bioresources. The Indian experience of different models of biodiversity governance from protected area network to community conservation and decentralized governance promotes conservation and development and is relevant in the context of the post-2015 development agenda. The empowerment of local institutions for effective biodiversity governance is important for the long-term sustainable management of natural resources, and the initiatives of biodiversity management committees at the local level illustrate this.

The book *Biodiversity and Sustainable Development* is targeted at a wide range of readers including policy makers, researchers, students, and nongovernmental institutions working for the cause of biodiversity conservation. We hope that this publication will further strengthen the effectiveness of biodiversity governance at different levels for a sustainable future. We extend our sincere thanks to all nationally and internationally renowned contributors for providing an in-depth study of

the Nagoya Protocol in the Indian context, which is the backbone of this book. We are also thankful to Springer for accepting the publication and for timely support in reviewing the book. We are grateful to all the staff of the Kerala State Biodiversity Board for their valuable inputs and cooperation in completing the book on time.

Kerala State Biodiversity Board
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12 April, 2016

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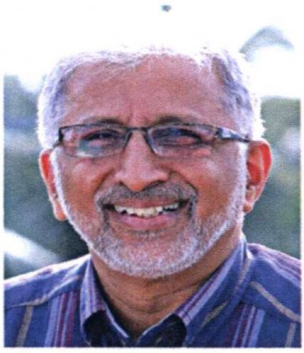
Editors

K.P. Laladhas holds a PhD degree in biochemistry and has more than 15 years of teaching experience. He has published several papers in national and international journals. Currently, he is functioning as member secretary of the Kerala State Biodiversity Board, the state's premier statutory organization dealing with matters relating to the conservation of biodiversity, sustainable use of its components, and equitable sharing of the benefits arising out of biological resources' utilization. He has been instrumental in the establishment of the biodiversity management committee, a statutory organization in all local self-governments of Kerala for the purpose of promoting conservation of biological resources in a decentralized way. Dr. Laladhas has been active in developing guidelines for protecting the interests of biodiversity conservation.

Preetha Nilayangode has a doctorate in forestry from the Forest Research Institute, Dehradun, India. Her major area of research has been on ex situ and in situ conservation of species. She has more than 14 years of experience in various aspects of biodiversity conservation and sustainable utilization, including value addition and development of bioproducts. She has published several papers in international and national journals and is serving as biodiversity specialist in the Kerala State Biodiversity Board. She is qualified in intellectual property management and is coordinating the implementation of access and benefit sharing in Kerala and access to bioresources in the state of Kerala. Dr. Preetha is also actively involved in implementing various conservation projects in Kerala and generating awareness of the intrinsic values of biodiversity among the public.



Oommen V. Oommen is an eminent zoologist and conservationist with three and a half decades of experience behind him. He is dedicated to the integration of scientific knowledge to natural resource management and is actively involved in science popularization programs. Currently, he is the chairman of the Kerala State Biodiversity Board; Hon. director of Centre for Venom Informatics, University of Kerala; Ex-emeritus scientist (CSIR), University of Kerala; and also an adjunct professor in the Central University of Kerala, Kasaragod, Kerala. Dr. Oommen is piloting a large number of conservation programs in Kerala mainly on aquatic and marine biodiversity, traditional breeds and varieties, and the ecosystem. He has initiated capacity-building programs for empowering the local community to manage their natural resources sustainably in Kerala and has promoted a people-inclusive form of biodiversity management of Western Ghats in Kerala.

Introduction

Sustainable development cannot be achieved without considering the environmental dimensions, and poverty eradication cannot be attained if ecosystem services and natural capital are degraded. In September 2015, 193 UN countries adopted the 2030 Sustainable Development Agenda to end poverty and protect the environment. The post-2015 development agenda includes 17 sustainable development goals balancing the three dimensions of sustainable development: environmental, social, and economic. These three dimensions are explored in *Biodiversity and Sustainable Development*, structured into three sections, namely:

- Access and benefit sharing for sustainable development
- Decentralized governance for sustainable development
- Biodiversity for sustainable livelihood

Access and Benefit Sharing for Sustainable Development

The three pillars of the Convention on Biological Diversity – conservation, sustainable use, and fair and equitable sharing of the benefits arising from the utilization of genetic resources – form the principal building blocks toward poverty eradication and sustainable development. The first section, Access and Benefit Sharing (ABS) for sustainable development, concentrates on the international agreements and national legislations for protecting the rights of the providers of bioresources and equitable sharing of the benefits arising out of the utilization of bioresources and associated traditional knowledge. The section details the Nagoya Protocol in the context of bioresource-rich and developing countries as India and the ensuing national initiatives for implementing ABS in India. The major provisions of the Biodiversity Act 2002 and Rules 2004 and salient features of the ABS regulations in India form the backbone of this section. The challenges in implementing the ABS legislations and some gap areas calling for immediate attention are reviewed by experts in the field of ABS, with specific case studies. The section also deals with

other related *sui generis* system for protecting the rights of communities as the Protection of Plant Varieties and Farmers' Rights Act and the role of the Traditional Knowledge Digital Library in protecting traditional knowledge and practices in India. The case studies of ABS in different aspects from research to commercialization and the contributions of the corporate sector to biodiversity conservation, sustainable use, and fair and equitable sharing of benefits will serve as a valuable source of information to provide a better understanding of access and benefit sharing in practice in developing countries. In the corporate sector, a wide range of institutes undertake research and develop commercial products from genetic resources. The approaches for benefit sharing with the providers of genetic resources vary, and the case studies illustrate different practices in vogue in India. ABS provisions at the local level contribute to economic well-being and are a long-term financing option for biodiversity conservation. The section through nine chapters delves into the economic aspects of sustainable development.

Decentralized Governance for Sustainable Development

India has devolved considerable powers to local self-government (LSG) institutions in rural areas, through Panchayati Raj Institutions (PRIs) with Gram Sabha and Gram Panchayat as the basic unit, which are usually at the level of a village. Biodiversity management is a multilayered process and the involvement of local communities in conservation planning should be at the core of conservation initiatives. The section expands the process of forming a biodiversity management committee (BMC) at the LSG level and through different case studies highlights the conservation initiatives at the local level. People's participation is a key element in biodiversity conservation and sustainable development and case studies of conservation of native varieties and breeds by local people, a quest worthy of emulation is presented in this section. Local communities depend on bioresources for their livelihood, but still community efforts have led to the conservation of habitats, species, and ecological services. Community conservation efforts, such as the conservation of turtles, crop diversity, etc., along with measures such as payment for ecosystem services which provide incentives to conserve biodiversity and use it sustainably are presented. The chapter on seed care movement illustrates a movement that has promoted conservation and the sustainable use of the seeds of indigenous varieties in smallholders' family farms in the Wayanad District of Kerala especially the tribal communities of *Kurichya*, *Kuruma*, *Pathiya*, and *Wayanadan Chetty*. Branding and promotion of products with unique qualities can generate premium market for such products, thereby providing sustainable livelihood options for the community. This section also outlines five case studies from Kerala, India, wherein GI registration has been obtained for a bioproduct rice variety and has succeeded in enhancing the livelihood of farmers by assuring a niche market. The section with six chapters through case studies explores biodiversity governance at three different levels, such

as local self-government, grassroot participation, and community conservation initiatives, and focus on the environmental aspects of sustainable development.

Biodiversity for Sustainable Livelihood

The poor people are the most dependent on ecosystem services for food, clothes, medicine, fuel, shelter, income, and other basic needs, and the unsustainable utilization of natural resources threatens their health and livelihood. Small-scale initiatives on local governance over resources and integration of traditional knowledge into planning and implementation of resource management regimes can ensure the resilience of ecosystems and provide sustainable livelihood options to communities. Poverty eradication and food security are addressed through the initiatives for providing sustainable livelihood to tribal communities through ecotourism, meliponiculture for poverty alleviation, monsoon floodplain fishery for nutritional security, and underutilized and minor crops for the diversity of food basket. The chapter on Idamalakudy, the tribal panchayat, explores the traditional ecological knowledge of Muthuvans and the tribal social structure. The Livestock sector plays an important role in providing sustainable rural livelihood in India, and the section gives an overview of the livestock sector in India and the native breeds of cattle and buffaloes in India and advocates greater thrust on preserving and augmenting superior native breeds of livestock for poverty eradication. The section through seven chapters gives a picture of the importance of biodiversity for sustainable livelihood and poverty eradication and focus on the social dimensions of sustainable development.

The book concludes with reflections on the lessons learned from the case studies and the author's hopes that the discussions generated by this book will help readers understand how international and national agreements relate to issues in their own lives, and the relevance of grassroot initiatives and bottom-up solutions for sustainable development. Sustainable development can be achieved only through finding solutions to local issues, taking into consideration the interests of the communities. *Biodiversity and Sustainable Development* attempts to bring out new approaches for an inclusive development considering that participation and grassroot empowerment are key drivers of equitable and sustainable development.