Biodiversity in Environmental Assessment: Enhancing Ecosystem Services for Human Well-Being

Human-induced development activities are introduced with insufficient attention to their consequences for our living environment, even in cases where environmental assessments have been carried out. This apparent lack of attention to biodiversity in environmental assessment is rooted in the difficulties we have in adequately addressing biodiversity within the scope, time frame, and budget allocated for assessments. This book provides a conceptual background and practical approaches to overcome these difficulties. It integrates the objectives of the Convention on Biological Diversity, its ecosystem approach, and the conceptual framework of the Millennium Ecosystem Assessment into a comprehensive approach to biodiversity in environmental assessment. It highlights the need to consider the value of biodiversity based on its use by each stakeholder, addresses the importance of both social and economic development to reach the Millennium Development Goals, and provides insights into ways to balance present and future needs.

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ECOLOGY, BIODIVERSITY AND CONSERVATION

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Biodiversity in Environmental Assessment

Enhancing Ecosystem Services for Human Well-Being

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CAMBRIDGE
UNIVERSITY PRESS

CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo, Delhi

Cambridge University Press
The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org
Information on this title: www.cambridge.org/9780521888417

First published 2010

Printed in the United Kingdom at the University Press, Cambridge

A catalogue record for this publication is available from the British Library

Library of Congress Cataloguing in Publication data
Biodiversity in environmental assessment : enhancing ecosystem services for human well-being / Roel Slootweg . . . [et al.].
p. cm. – (Ecology, biodiversity and conservation)
Includes bibliographical references and index.
ISBN 978-0-521-88841-7 (hardback)
1. Biodiversity conservation. 2. Environmental monitoring. 3. Environmental indicators. 4. Human ecology. I. Slootweg, Roel, 1958– II. Title. III. Series.
QH75.B53245 2009
363.7′063 – dc22 2009036657

ISBN 978-0-521-88841-7 Hardback
ISBN 978-0-521-71655-0 Paperback

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Foreword

Clean water and air, food, and shelter are the cornerstones of human well-being. Thanks to the intricate interactions between the millions of species that make up Earth's biodiversity and the many ecosystem services they provide, we can meet our basic, and not so basic, needs. Yet, the ecological footprint of humanity already exceeds Earth's capacity to regenerate and continue delivering these goods and services. Large-scale human interventions that seriously impact both biodiversity and ecosystem functions continue to increase. New policies, plans, and programmes are introduced with insufficient attention to the consequences for our living environment, even in cases where environmental assessments have been carried out. This apparent lack of attention to biodiversity in environmental assessment is not so much a deliberate decision to ignore natural processes but is rooted in the difficulties we face in adequately addressing biodiversity within the time frame and budget allocated for assessments.

This book provides a conceptual background and practical approaches to overcome these apparent difficulties. It fully integrates the objectives of the Convention on Biological Diversity, its ecosystem approach, and the conceptual framework of the Millennium Ecosystem Assessment into a comprehensive approach to biodiversity in environmental assessment. It highlights the need to consider the value of biodiversity based on its use by each stakeholder, addresses the importance of both social and economic development to reach the Millennium Development Goals, and provides insights into ways to balance present and future needs. The authors have drawn together helpful case studies that demonstrate how biodiversity can and should be integrated into environmental and strategic assessments. They provide a powerful argument that biodiversity can and must be considered to ensure that projects, programmes, and policies are culturally, environmentally, and socially acceptable. In this respect the book provides a valuable source of information for academics, and practitioners as well as decision makers.

Ahmed Djoghlaf
Executive Secretary, Convention on Biological Diversity

Preface

The incorporation of biodiversity-related issues in impact assessment has received considerable attention from the global conservation community comprising practitioners, academics, planners, and decision makers. The secretariat of the Convention on Biological Diversity (CBD) and the Ecology and Biodiversity section of the International Association for Impact Assessment (IAIA) have been active in developing guidelines for the better integration of biodiversity in both Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA). Other bodies like the Convention on Wetlands of International Importance (Ramsar, 1971), Convention on the conservation of European wildlife and nature habitats (Bern, 1979), and the Convention on Migratory Species (Bonn, 1979) have also been influential on the topic. Special biodiversity issues of impact assessment-related scientific journals (*Impact Assessment and Policy Appraisal* and *Journal of Environmental Assessment Policy and Management*) have contributed in highlighting the need for integrating biodiversity concerns in impact assessment. With these specific efforts, a desirable convergence of interests has now come about between international biodiversity related initiatives and the world of impact assessment. Despite this, literature search and the recent reviews of impact assessment studies suggest that biodiversity considerations on the whole are not as well served by impact assessment practice as they should be. There consequently is an urgent need to bring together the varied experience gathered in the areas of ecology/biodiversity conservation and impact assessment.

The only comprehensive book available on biodiversity in impact assessment so far is *Ecological Impact Assessment* by Jo Treweek (1999). As the focus of this book was limited to Environmental Impact Assessment and its internationally accepted procedural steps, an update is genuinely needed after rapid and recent developments in Strategic Environmental Assessment. Furthermore, the earlier book is written from a European nature conservation background and consequently lacks the perspective

of human development needs, emphasised by the Biodiversity Convention, Millennium Ecosystem Assessment, and Millennium Development Goals. In a globalising and increasingly interrelated world, this book is the logical and necessary follow up to Treweek's important pioneering work. The group of four author/editors, who have been actively involved in promoting the science and practice of impact assessment through their varied roles as teachers, trainers, and practitioners, have taken a lead in this direction.

The targeted audience of this book can be found in the industrialised world (often referred to as western countries, even although some lie very far south or east) as well as in the developing world and includes scientists from biological, economic, and social sciences as well as practitioners involved in the design of (conceptual and regulatory) frameworks for environmental assessment. The book also provides a useful insight for business and corporate groups who are keen to acknowledge the relevance of encouraging development that also benefits biodiversity. Of course, the book provides relevant material to students who are the ones that have to internalise the new concepts presented in this book and (hopefully) act as the real agents of change throughout their professional careers.

The book is academic in nature, but firmly rooted in everyday practice. It is not a practical how-to-do guideline, but it provides a view on how to address questions related to biodiversity and human development needs in an environmental assessment context. Where possible, case material is used to illustrate and support arguments and logic. Text boxes appear throughout the book to provide supporting case evidence. The case material has been included in various sections to enrich the book with practical examples; this material is often hidden in inaccessible 'grey' literature, such as planning documents, project proposals and appraisals, environmental impact statements, or evaluation reports, and is seldom referred to in the formal scientific literature. Of course, the authors have extensive practical experience in conducting studies in all major sectors on four continents and draw extensively from their experience throughout the book.

Many of the ideas expressed in this book evolved from spirited discussions with friends and environmental professionals during the annual meetings of the International Association for Impact Assessment (IAIA), the world's largest network of impact assessment experts. These discussions repeatedly highlighted the need for a book on this subject that has been long overdue and actually lured four of us to make a book become

a reality. Friends and colleagues with whom we had more frequent intellectual discussions will see their influence throughout this book.

We drew extensively from the invaluable and rich source of information of many professionals represented on the different sections of IAIA, who shared their scientific writings, experiences, and case studies with us. We are especially most grateful to all those who have contributed to the work of the biodiversity section of IAIA since its first meeting in 1997. Many will find their work referred to throughout the book.

Our sincere words of appreciation are for Professor Michael Usher, Series Editor for Cambridge University Press who not only invited us to write this book but has been an enthusiastic source of energy and encouragement. He helped in shaping the initial idea for the book and subsequently provided several rounds of comments on each chapter, on matters of style, organization, and coverage, as well as detailed comments on the subject matter of the book. Alan Crowden of Cambridge University Press instilled a sense of urgency for hastening our writing. His remark 'that most books that take long are the ones that never get finished at all' helped us regain our speed when the going was slow for one or another reason.

For two of us (Asha and Vinod), the Wildlife Institute of India (WII) provided the stimulating academic environment for writing of this book. Mr P. R. Sinha, Director, Wildlife Institute of India, reposed immense trust in our abilities to handle both the writing of the book and our professional responsibilities.

We acknowledge the Netherlands Commission for Environmental Assessment for supporting this endeavour. We thank Mr Ahmed Djoghlaf, Executive Secretary of the Convention on Biological Diversity (CBD), for considering this book worthy of his appreciative Foreword.

Our families were caring and understanding and provided the tranquility and peace of mind for writing the book especially when the authors were located in different parts of the world with different time zones. Our computers never showed sign of fatigue and the e-communication technology never let us down during several back and forth consultations that were inevitable in every stage of the book production.

Publishing with Cambridge University Press, the oldest and one of the largest academic publishers in the world, is an honour.

And finally, we thank you, the reader, for picking up this book and using it to expanding the horizon of impact assessment by popularising the innovative thoughts and perspectives that we have tried sharing through this book. I hope you find something in here useful!

Abbreviations

BAP	Biodiversity Action Plan
CBA	Cost–Benefit Analysis
CBD	Convention on Biological Diversity
CEAA	Canadian Environmental Assessment Agency
CEQ	Council on Environmental Quality
CIDA	Canadian International Development Agency
CoP	Conference of Parties (governing body of an international convention)
CSIR	Council for Scientific and Industrial Research (South Africa)
CVM	Contingent Valuation Method
DFID	Department of International Development (UK)
DSS	Decision Support System
E&P Forum	Oil Industry International Exploration and Production Forum
EBI	Energy and Biodiversity Initiative
EC	European Commission (implementing body of the European Union)
EC	European Council (main decision-making body of the European Union)
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
ESIA	Environmental and Social Impact Assessment
EU	European Union
EVRI	Environmental Valuation Reference Inventory
GIS	Geographic Information System
HIA	Health Impact Assessment
IA	Impact Assessment

IAIA	International Association of Impact Assessment
ICMM	International Council on Mining and Minerals
IEEM	Institute of Ecology and Environmental Management
IFC	International Finance Corporation
IIED	International Institute for Environment and Development
IPCC	Intergovernmental Panel on Climate Change
IPIECA	International Petroleum Industry Environmental Conservation Association
IPTRID	International Programme for Technology and Research in Irrigation and Drainage (at the UN Food and Agricultural Organisation)
IUCN	International Union for the Conservation of Nature/ The World Conservation Union
NBSAP	National Biodiversity Strategy and Action Plan
MA	Millennium Ecosystem Assessment
MCA	Multi-Criteria Analysis
MDGs	Millennium Development Goals
MMSD	Mining, Minerals and Sustainable Development project
NEN	National Ecological Network
NEPA	USA National Environmental Policy Act
NGOs	Non-Governmental Organisations
NSW	New South Wales (Australia)
OECD	Organisation for Economic Cooperation and Development
OECD-DAC	OECD Development Assistance Committee
PES	Payment for Ecosystem Services
RSPB	Royal Society for the Protection of Birds (Birdlife UK)
SAIEA	Southern African Institute for Environmental Assessment
SAP	Species Action Plan
SEA	Strategic Environmental Assessment
SEAN	Strategic Environmental Analysis
SIA	Social Impact Assessment
SIDA	Swedish International Development Cooperation Agency
PPP	People, Planet, Profit (triple bottom line of sustainability, used in the corporate sector)

	Plans, Polices, and Programmes (decision-making levels where SEA applies)
TEV	Total Economic Value (of an ecosystem)
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
VROM	Netherlands Ministry of Housing, Spatial Planning and Environment
WCED	World Commission on Environment and Development
WII	Wildlife Institute of India
WTP	Willingness to Pay