

### **Environmental Management for Sustainable Development**

#### **Second Edition**

Environmental management is a wide, expanding, and rapidly evolving field, which concerns all humans, and plays a crucial role in the quest for sustainable development. Environmental management affects everybody from individual citizens, farmers, administrators and lawyers, to businesses, governments, international agencies and non-governmental organisations.

This updated second edition explores the nature and role of environmental management, covering key principles and practice, and offers a comprehensive and understandable introduction, which points readers to further in-depth coverage. This new edition reflects the rapid expansion and evolution of the field and focuses much more strongly on sustainable development. There has also been extensive rearrangement to make the book more accessible to those unfamiliar with environmental management and lacking a science background and there is greater coverage of topics such as key resources under stress, environmental management tools and urban environmental management. Among the key themes covered are:

- sustainable development
- proactive approaches
- the precautionary principle
- the 'polluter-pays' principle
- the need for humans to be less vulnerable and more adaptable.

With rapid expansion and evolution of the subject it is easy for those starting to study it to get disorientated, but *Environmental Management for Sustainable Development* offers a structured coverage and foundation for further, more-focused interest. The book is a much revised, restructured and updated second edition accessible to all readers. It is illustrated throughout with figures, plates and case studies.

**Chris Barrow** is Reader in the School of the Environment and Society at the University of Wales Swansea.

#### **Routledge Introductions to Environment**

## **Environmental Management for Sustainable Development**

**Second Edition** 

C.J. Barrow

First published 1999 by Routledge 2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

Simultaneously published in the USA and Canada by Routledge 270 Madison Ave, New York, NY 10016

Second edition 2006

Routledge is an imprint of the Taylor & Francis Group, an informa business

© 1999, 2006 C.J. Barrow

Typeset in Times and Franklin Gothic by Florence Production Ltd, Stoodleigh, Devon Printed and bound in Great Britain by TJ International Ltd, Padstow, Cornwall

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the
British Library

Library of Congress Cataloging in Publication Data Barrow, Christopher J.

Environmental management for sustainable development / C.J. Barrow. – 2nd ed.

p. cm.

Rev. ed. of: Environmental management and development.

Includes bibliographical references and index.

1. Environmental management. 2. Environmental policy.

Sustainable development. I. Barrow, Christopher J. Environmental management and development. II. Title. GE300.B375 2006

363.7'05-dc22

2005037580

ISBN10: 0-415-36534-1 (hbk) ISBN10: 0-415-36535-X (pbk) ISBN10: 0-203-01667-X (ebk)

ISBN13: 978-0-415-36534-5 (hbk) ISBN13: 978-0-415-36535-2 (pbk) ISBN13: 978-0-203-01667-1 (ebk)

## Contents

List of must	rations	VI
Preface		ix
PART I	THEORY, PRINCIPLES AND KEY CONCEPTS	
Chapter 1	Introduction	3
Chapter 2	Environmental management fundamentals and goals	20
Chapter 3	Environmental management and science	39
Chapter 4	Environmentalism, social sciences, economics and environmental management	77
	-	
Chapter 5	Environmental management, business and law	111
Chapter 6	Participants in environmental management	143
PART II	PRACTICE	
Chapter 7	Environmental management approaches	163
Chapter 8	Standards, monitoring, modelling, auditing and	176
	co-ordination	176
Chapter 9	Proactive assessment, prediction and forecasting	204
Chapter 10	Key resources	235
Chapter 11	Global challenges	269
Chapter 12	Pollution and waste management	289
Chapter 13	Environmental management in sensitive, vulnerable and	
	difficult situations	312
Chapter 14	Tourism and environmental management	333
Chapter 15	Urban environmental management	345

# Illustrations

#### **Figures**

1.1	A typical scheme of practice adopted for environmental management	1
2.1	Time horizon of the World3 model	28
2.2	Major decision-making steps in a typical environmental management	
	process	3
3.1	Cape Disappointment (South Georgia)	40
3.2	Natural system and social system relationship	41
3.3	A glacier calving into the sea, Cumberland Bay (South Georgia)	44
3.4	The relations between ecosystem components	47
3.5	Two approaches to studying ecosystems	50
3.6	Baltic Sea Joint Comprehensive Action Programme	57
	Abrupt boundary between cleared lowland tropical rainforest and	
	young oil palm plantation (Peninsular Malaysia)	64
4.1	The elements of total economic value	94
4.2	A classification of environmental resources	98
5.1	Corporate environmental management: the parties involved	114
5.2	Eco-labelling	123
5.3	The Antarctic	135
6.1	Tucuruí Dam, across the Tocantins River (Amazonian Brazil)	151
6.2	Schematic illustration of the links between the major factors that can	
	have an influence upon, or reinforce, environmental degradation	152
7.1	Linkages of levels in sustainable development tasks	171
8.1	European Union Eco-Management and Audit Scheme (EMAS)	
	eco-audit award logo	192
8.2	Basic environmental management system approach	199
8.3	The basic provisions of the European Union's EMAS	200
9.1	How impact assessment fits into planning	209
9.2	Relationship of environmental impact assessment (EIA), technology	
	assessment, social forecasting and social impact assessment (SIA)	209
9.3	Relationships, possible exchanges of information and methodologies	

10.2	Species-rich tropical montane rainforest clothing the Cameron	
	Highlands (Malaysia)	262
	Landfill refuse disposal site in Belgium	296
12.2	Sungai Besi tin mine, south of Kuala Lumpur (Malaysia)	298
13.1	Alpine resort of Cervinia (Italy)	32
13.2	Overgrazed land and poorly maintained terraces, High Atlas Mountains (Morocco)	322
13.3	Vegetation damage leading to soil degradation. Deforested landscape	
	in the High Atlas Mountains (Morocco)	324
14.1	The development of apartments and hotels in the Cameron Highlands	
	(Malaysia)	334
	Crocodile farm by Lake Tonle Sap (Cambodia)	330
	Yucatán (Mexico)	339
	Typical Southeast Asian shop-house/workshop	349
15.2	Cycles, rickshaws and motorcycles still outnumber cars in most	
	Vietnamese towns and cities (Hanoi)	355
	What the world wants – and how to pay for it	369
	Singapore	37
16.3	Mass rapid transport (Singapore)	372
Tables		
3.1	Classifications of environmental systems	48
	Hierarchical ecosystem classification used in The Netherlands	50
Boxes		
so servindroman	Some definitions of environmental management	
	Some definitions of sustainable development	13
	Approaches to environmental management	2
	Ecological concepts and parameters which are useful for	-
5.1	environmental management	4
3.2	Advantages and disadvantages of the ecosystem approach	5:
	How the ecosystem approach can advise the environmental	
0.0	manager	54
4.1	Common property resource	8
	Some common green characteristics	8:
	Concepts dealing with human—environment relations	8
	Broad groupings of greens	8
	Curitiba City (Brazil)	9
	The positive and negative effects of free trade on environmental	

#### viii • Illustrations

6.2	Why the public should be involved in environmental management	155
8.1	Measuring sustainable development	183
8.2	Types of eco-audit	193
8.3	Eco-audit-environmental management system standards	194
9.1	An overview of EIA	207
9.2	Typical step-wise EIA process	208
9.3	The 1969 US National Environmental Policy Act	212
11.1	Transboundary issues caused or affected by human activity	276
11.2	Transboundary issues caused by natural processes	280
12.1	The polluter-pays principle, NIMBY and NIABY	292

# Preface to the second edition

This book explores the nature, scope and role of environmental management, with a strong focus on sustainable development. It offers a foundation for a series of texts which deal with the application of environmental management, including:

Environmental Risk Management Managing Environmental Pollution Coastal and Estuarine Management Countryside Management Environmental Assessment in Practice

Environmental management is a broad and rapidly evolving discipline. This book explores the subject's core themes and principles, which include:

- a goal of sustainable development;
- · a multidisciplinary, interdisciplinary or holistic approach;
- support for the 'polluter-pays principle';
- concern for limits, hazards and potential;
- an attempt to act beyond the local or project level;
- support for long-term not just short-term planning;
- adherence to the 'precautionary principle';
- translation of theory to effective practice;
- the integration of environmental science, planning and management, policy making and public involvement;
- an awareness of the need to change the ethics of peoples, businesses and governments.

The decision was made to prepare a second edition in 2004, five years after the publication of the original. This was prompted by considerable development of the field marked by: the appearance of many new taught courses; the expansion of media coverage; increasing government, agency and citizen interest. This new edition, as well as being updated, seeks to better address sustainable development, key resource issues,

urban environments, environmental change and tourism. The evolution of environmental management tools and approaches and the expansion of Internet sources also necessitated some updating. Since the late 1990s there has been increased involvement of social scientists, lawyers, business, politicians and economists in environmental management, and its use has spread beyond developed countries.

CJB January 2006