



CRC Press  
Taylor & Francis Group

# Environmental Sustainability

Practical Global Implications



Edited by

**Fraser Smith**

# Environmental Sustainability

Practical Global Implications

Edited by  
**Fraser Smith**



**CRC Press**

Taylor & Francis Group

Boca Raton London New York

CRC Press is an imprint of the  
Taylor & Francis Group, an **informa** business

CRC Press  
Taylor & Francis Group  
6000 Broken Sound Parkway NW, Suite 300  
Boca Raton, FL 33487-2742

First issued in hardback 2019

© 1997 by Taylor & Francis Group, LLC  
CRC Press is an imprint of Taylor & Francis Group, an Informa business

No claim to original U.S. Government works

ISBN-13: 978-1-57444-077-5 (hbk)

This book contains information obtained from authentic and highly regarded sources. Reasonable efforts have been made to publish reliable data and information, but the author and publisher cannot assume responsibility for the validity of all materials or the consequences of their use. The authors and publishers have attempted to trace the copyright holders of all material reproduced in this publication and apologize to copyright holders if permission to publish in this form has not been obtained. If any copyright material has not been acknowledged please write and let us know so we may rectify in any future reprint.

Except as permitted under U.S. Copyright Law, no part of this book may be reprinted, reproduced, transmitted, or utilized in any form by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying, microfilming, and recording, or in any information storage or retrieval system, without written permission from the publishers.

For permission to photocopy or use material electronically from this work, please access [www.copyright.com](http://www.copyright.com) (<http://www.copyright.com/>) or contact the Copyright Clearance Center, Inc. (CCC), 222 Rosewood Drive, Danvers, MA 01923, 978-750-8400. CCC is a not-for-profit organization that provides licenses and registration for a variety of users. For organizations that have been granted a photocopy license by the CCC, a separate system of payment has been arranged.

**Trademark Notice:** Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

**Visit the Taylor & Francis Web site at**  
**<http://www.taylorandfrancis.com>**

**and the CRC Press Web site at**  
**<http://www.crcpress.com>**

*For Laura, to whom it's all obvious*





# Taylor & Francis

Taylor & Francis Group

<http://taylorandfrancis.com>

---

# Contents

---

Foreword ix

*Tim O’Riordan*

Preface xi

The Authors xv

- 1** A Synthetic Framework and a Heuristic for Integrating Multiple Perspectives on Sustainability ..... 1  
*Fraser Smith*

**Part I. Philosophical Perspectives: Third World and First World Compared**

- 2** Patterns of Sustainability in the Americas: The U.S. and Amerindian Lifestyles ..... 27  
*Clóvis Cavalcanti*

- 3** Ecologically Sustainable Institutions ..... 47  
*Aseem Prakash and Anil K. Gupta*

- 4** Sustainable Development: A Southeast Asian Perspective ..... 67  
*Kiew Bong Heang*

**Part II. Practical Steps Toward Sustainability**

- 5** Economic vs. Financial Pricing of Timber and Its Probable Impact on National Accounts: The Costa Rican Case, 1980–92 ..... 87  
*Juan Antonio Aguirre Gonzalez*

- 6** The Valuation and Pricing of Non-Timber Forest Products: Conceptual Issues and a Case Study from India ..... 107  
*Kanchan Chopra*

<b>7</b>	Poverty Alleviation, Empowerment, and Sustainable Resource Use: Experiments in Inland Fisheries Management in Bangladesh .....	141
	<i>Ana Doris Capistrano, Mokammel Hossain, and Mahfuzuddin Ahmed</i>	
<b>8</b>	Wildlife Use for Economic Gain: The Potential for Wildlife to Contribute to Development in Namibia .....	163
	<i>Caroline Ashley and Jonathan Barnes</i>	
<b>9</b>	Resources Used in Attaining Land Tenure Security: The Case of Peruvian Amazonia .....	193
	<i>Roxana M. Barrantes</i>	
<b>10</b>	Property Rights, Nature Conservation, and Land Reform in South Africa .....	213
	<i>Neil Adger</i>	
<b>11</b>	Sustainable Development at the Village Community Level: A Third World Perspective .....	233
	<i>Victor M. Toledo</i>	
<b>12</b>	Energy, Environment, and Development: Egypt, South Africa, and China .....	251
	<i>Kathleen L. Abdalla</i>	
	Index .....	279

---

# Foreword

---

In the hue and cry over the need to become more sustainable in our brief tenancy on this unique and miraculous planet, it is all too easy to ignore the voices of those who can teach a lot about what it is like to live sustainably. Throughout the globe, there are heartening attempts to create meaningful arrangements in environmental rights and communal obligations that can lead to a more enduring habitation. Why do we not listen to such voices? Mostly because we do not appear to want to learn, but also because there is no forum for their articulation.

Fraser Smith and his colleagues address this second point. What follows is an unusual collection of essays, primarily rooted in Third World experience, where the principles of living ecologically are converted into economic and social experience. It should come as no surprise, but nevertheless it is still worthy of note, that societies that exist to care for their surroundings and for each other appear more healthy, happy, and forgiving. The paradox is that the greater the accumulation of wealth, despite its hugely damaging repercussions, the greater the avarice and the less happy or generous are the accumulators. This is a frightening conclusion. Sustainable development means sharing and caring for a humanity that has to tend for the planet as well as for itself. Yet democratic institutions are built up on patterns of power that only gain their influence because of exploitation of nature and peoples. So how do we shift toward sustainability through a democracy that is dependent on unsustainable practices?

The answer is by reading and responding to the heartening chapters that follow. These are the voice of pain, suffering, yet also the voice of the joyous innocence of the pre-exploited Amerindians to the brave initiatives by non-governmental organizations to retain or return property rights into common ownership and reciprocal obligation. Much of these imaginative schemes are being tried out against the grain of development pressures, international aid, and national government corruption and patronage practices which distort all prices to featherbed the already wealthy.

This is a book ostensibly about ecological economics, an emerging interdisciplinary science that seeks to unite the home of humankind to the home of

nature. Natural systems provide humanity with a vast array of environmental services that we are beginning to understand, codify, and value. The important task of the ecological economist is to ensure that these vital functions are fully recognized before, not after, development has taken place, so that the well-being of natural systems and the quasi-sustainable human communities that maintain them are a source of both admiration and respect, as well as a vital laboratory for the future.

Yet the “pain” of damage lies rooted in so many hostile political, economic, and social arrangements the world over. We cannot begin to put the global house in order before we turn to these hugely damaging arrangements and, with the persistent voice of eco-sanity, begin to dismantle them. This book helps us all to see how it can be done and that the task is so desperately important for us all.

**Timothy O’Riordan**

School of Environmental Sciences  
University of East Anglia  
Norwich, U.K.

---

# Preface

---

*However much you study you cannot know without action.*

Thirteenth-century Sufi author Saadi of Shiraz

While sustainable development has become an increasingly important issue in academia, government, and business, the vast majority of discussions on the subject that reach a wide audience emanate from the rich, industrialized nations. These discussions have mostly ignored the important contribution from developing countries, whose authors often have distinct and revealing ways of approaching the subject. This book aims to redress this imbalance in the literature by presenting the state of the art on sustainable development from outside the countries of the Organization for Economic Co-operation and Development (OECD). Most of the chapters in the book discuss practical approaches that can be, or are already being, taken to implement environmentally sustainable economies. This emphasis is the rationale for the book, based on the old adage that actions speak louder than words, and therefore broadcasting the actions rather than the words will add the greatest value. However, as this book reveals, there are important philosophical differences between the “Northern” and “Southern” notions of sustainable development, and therefore an equally important task here is to set the basis for a more complete vision combining the two perspectives.

The idea for the book originally came out of the second biennial meeting of the International Society for Ecological Economics in Stockholm in 1992. That meeting itself lacked significant input from developing countries. Many participants, myself included, felt that improving the ISEE’s representation from outside the OECD would be a valuable exercise. The subsequent meeting in Costa Rica in 1994 generated a profusion of ideas among an extremely diverse mixture of delegates from all over the developing world, and the chapters herein are largely derived from papers presented at that meeting. The contributors are drawn from universities, research institutes, governmental organizations, and non-governmental organizations. They are mostly nationals of developing coun-

tries plus a few nationals of OECD countries who have spent substantial amounts of time working in the developing world.

The perspectives presented here are drawn from Central and South America, sub-Saharan Africa, and South and Southeast Asia. They cover an extremely broad range of topics, including the philosophy of sustainable development, institutions, ethics, belief systems, “indigenous” cultures, resource use, energy use, economic modeling, econometric analysis, international trade, financial aid, forestry, wildlife, land rights, fisheries, and more. Whatever the interest of the reader on sustainable development, this book is likely to contain something useful.

The breadth of the book was an explicit aim from the beginning, for two reasons. First, none of the chapters that follow is intended as an exhaustive in-depth analyses of its topic; nonetheless, analytical rigor is still the first priority. The chapters present familiar topics in a new light, suggesting ways to improve current theory and practice and proposing avenues for further work. The second reason for a broad scope is that the book is intended for a wide audience. Catering to a diverse readership will, it is hoped, give the “Southern” perspective the prominent voice it deserves. In preparing this book, and at the conference that spawned it, I was surprised by how strongly colleagues from developing countries felt about increasing the profile of the Southern view in the international arena. To this end, the book should be readable by academics and interested lay parties alike; both can probe further into particular areas as their interest takes them. Technicalities—equations, acronyms, and jargon—are confined as far as possible to footnotes.

The value of this volume may be measured not only in terms of the ideas that it contains but also as a reference guide. Students in natural and social sciences may find material for writing papers, development professionals may find ideas for improving their operations, entrepreneurs may find opportunities for ecologically sustainable businesses, and academics may make contact with colleagues they would not normally have found. It is hoped that, as a source of contacts especially, the book will not only bring workers from rich and poor countries into collaboration but will also bring workers together from different parts of the developing world, which is often a difficult task.

The book is divided into two major sections which address the dual aims of the book described above. The first discusses philosophical and conceptual aspects of sustainable development from the point of view of people in developing countries. One of the more prominent themes in this section is the need to change attitudes in the wider world to be more closely aligned with those people who live in relatively sustainable harmony with their natural surroundings. Clóvis Cavalcanti draws contrasts between the attitudes and lifestyles in the United

States and those of the Amerindians in Brazil and argues that while the Amerindian lifestyle is “not a panacea,” it serves as an example of a set of guiding principles to bring the rich countries closer to ecological sustainability. At the same time, it might bring greater fulfillment to the people of the rich countries, whose social dislocation is clearly evident. The authors of these preliminary chapters universally agree that global environmental sustainability is possible only if people in rich countries change the way they live, and the authors offer some guides on how to do this.

The second section contains detailed case studies from around the developing world that are used to support new arguments about sustainable development or test existing ones. Many of these case studies highlight the challenges and successes of specific efforts to make economic activities more ecologically sustainable. Many of these chapters tackle head-on the linkages among social and ecological processes operating at a variety of levels. Local ecological conditions and economic practices in developing and industrialized regions influence each other via a variety of large-scale natural and economic forces. In many cases, social and ecological problems arise from distributional inequities between rich and poor and in the geographical discounting of environmental and social degradation. The authors present a diverse array of approaches—institutional, political, and market based—to improve the way these linkages operate.

At the Costa Rica meeting from which this book is drawn, there was much talk of “visioning” how the world should be in fifty, a hundred, or a thousand years. Not surprisingly, people’s visions converged on a world in which humanity lives in peace and comfort within natural limits. This volume presents in its first part a collective vision that attempts to distill how the world’s poor would like things to turn out and in its second part a vision on how to get there. These visions are perhaps most valuable for environmental sustainability because the usual emphasis on material well-being is counterbalanced by spiritual and social well-being, which cannot be valued monetarily.

The appeal of the book is, it is hoped, as much in the details as in the broader messages. The wealth of field data collected in the following pages may stimulate the reader to concoct new avenues of investigation into sustainable development or to design novel practical applications. While the overriding message is that the South has much of importance to say about sustainable development which could or should be acted upon, the underlying message is that developing countries also harbor much of the necessary knowledge and expertise, until now barely tapped. Readers in rich and poor countries alike will, I hope, be stimulated enough by the results from others’ backyards to try it in their own. At any rate, whether as a source of reference or as a philosophical statement, I hope the



reader will find the book as much of an eye-opener as I have in the course of its preparation.

Finally, grateful acknowledgments go to Ed DeBellevue for his valuable help and advice in the early stages of this project and to Sandra Koskoff for facilitating the partnership with St. Lucie Press. Special thanks go also to all the contributors, whose commitment to the project and diligent communication across great distances went far beyond my expectations.

**Fraser Smith**  
San Francisco

---

# The Authors

---

**Kathleen L. Abdalla** is First Economic Affairs Officer at the United Nations Economic and Social Commission for Western Asia (Amman, Jordan), P.O. Box 5749, New York, New York, 10163–5749, USA. E-mail: kathleen@nets.com.jo.

**Neil Adger** is a Senior Research Fellow at the Centre for Social and Economic Research on the Global Environment, University of East Anglia, Norwich NR4 7TJ, and University College, London, UK. E-mail: n.adger@uea.ac.uk.

**Juan Antonio Aguirre Gonzalez** is a Graduate Teaching and Research Professor in Agriculture and Environmental Economics and Head of Graduate Studies at the Centro Agronómico Tropical para Investigaciones y Enseñanza (CATIE), Apartado 52-7170, Turrialba, Costa Rica. E-mail: jaguirre@catie.ac.cr.

**Mahfuzuddin Ahmed** is a Social Scientist at the International Center for Living Aquatic Resources Management (ICLARM), MC P.O. Box 2631, 0718 Makati City, Philippines. Fax: 63 2 816 3183.

**Caroline Ashley** is a Resource Economist at the Directorate of Environmental Affairs, Ministry of Environment and Tourism, P.O. Box 13306, Windhoek, Namibia. E-mail: ca@deal.dea.met.gov.na.

**Jonathan Barnes** is a Resource Economist with the World Wildlife Fund (U.S.) LIFE Programme, Directorate of Environmental Affairs, Ministry of Environment and Tourism, P.O. Box 13306, Windhoek, Namibia. E-mail: jb@deal.dea.met.gov.na.

**Roxana M. Barrantes** is a National Consultant for the Organismo Supervisor de la Inversion Privada en Telecomunicaciones, Centro Comercial Camino Real, Torre El Pilar, Lima 27, Perú, and an Assistant Professor at the Department of Economics, Pontificia Universidad Católica del Perú. E-mail: rbarrant@pnud12.pnudreg.org.pe.

**Ana Doris Capistrano** is a Program Officer at the Ford Foundation (India Office), 55 Lodi Estate, New Delhi 110003. E-mail: d.capistrano@fordfound.org.

**Clóvis Cavalcanti** is a Senior Researcher at the Fundação Joaquim Nabuco, INPSO, R. Dois Irmaos, 52071-440 Recife, PE, Brazil. E-mail: clovati@fundaj.gov.br.

**Kanchan Chopra** is a Professor at the Institute of Economic Growth, University Enclave, Delhi 110007, India. E-mail: kc@ieg.ernet.in.

**Anil K. Gupta** is a Professor at the Centre for Management in Agriculture, Indian Institute of Management, Ahmedabad 380015, India. He is also the Coordinator of SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions) and Editor of *Honey Bee*, a magazine on sustainable development. E-mail: anilg@iimahd.ernet.in.

**Kiew Bong Heang** is a Lecturer at the Department of Zoology, Faculty of Science, University of Malaya, 59100 Kuala Lumpur, Malaysia. E-mail: kiew@zoology.um.edu.my.

**Mokammel Hossain** is Project Director of the Community-Based Fisheries Management Project, Department of Fisheries, Government of Bangladesh Ministry of Fisheries and Livestock, Park Avenue, Ramna, Dhaka, Bangladesh.

**Aseem Prakash** is an Assistant Professor at the Department of Strategic Management and Public Policy, School of Business and Public Management, The George Washington University, Washington, D.C., USA.

**Fraser Smith** is an Infoware Manager at Datafusion, Inc., 3220 Sacramento Street, San Francisco, CA 94115, USA. E-mail: fraser@datafusion.net.

**Victor M. Toledo** is a Researcher at the Centro de Ecología, Universidad Nacional Autónoma de México, Apartado 41-H Santa Maria Guido, Morelia, Michoacán 58090, Mexico.

---

# A Synthetic Framework and a Heuristic for Integrating Multiple Perspectives on Sustainability

---

**Fraser Smith\***

*Datafusion, Inc., San Francisco, California*

## Abstract

Because the challenge of sustainability is heterogeneous in time and space, it will require heterogeneous solutions. This introductory chapter draws together the findings of the other chapters in the present volume to draft a synthetic framework to guide this heterogeneous challenge. The inspiration for this approach comes from the synthetic theory of biological evolution, which emerged from two divergent evolutionary disciplines in the 1930s and 1940s.

The framework integrates the heterogeneous “Southern” perspectives presented in subsequent chapters with the predominating “Northern” perspective characterized here. The Southern views contain a number of common themes, elaborated in this chapter, which differ substantially from the Northern perspective. The present chapter makes a critical analysis of both sets of views and integrates them for a more complete vision, establishing broad criteria for sustainability and enumerating a suite of metrics. Under the framework, different criteria and different metrics will apply in different circumstances. As an illustrative example, the framework is applied to the problem of harvesting fish for ecological stability and economic return.

---

\* The views expressed in this chapter are those of the author and not necessarily those of Datafusion, Inc.

One of the recurring themes in this book is the emphasis on economic growth as a *prerequisite* of sustainability in developing countries. Using a simple heuristic to model economic activity in relation to resource throughput, population, and technology, it is shown that sustainability would allow economic growth as long as certain conditions were satisfied concerning technology; in fact, certain technologies may be beneficial for sustainability. It is intended that the use of heuristics, such as the one presented here, may, within a synthetic framework for sustainability, help to identify the important drivers for formulating integrated, heterogeneous solutions to the problem.

Dominion of the world from end to end  
Is worth less than a drip of blood upon the earth.

*Saadi of Shiraz*

## Introduction

In the last few years, much has been written about the concept of “sustainable development,” to the point where whole books are devoted to defining it (e.g., van den Bergh and van der Straaten, 1994; Reid, 1995). The term is, in fact, so vague that it has been used not only by advocates of precaution to refer to the environmental sustainability of economic activity but also by advocates of growth to refer to the sustainability of economic expansion—two concepts that appear at first glance to be diametrically opposed. In 1987, the World Commission on Environment and Development (WCED) attempted to provide a definition of environmentally sustainable development which has, almost ten years hence, passed into common parlance: “sustainable development is development that meets the needs of the current generation without compromising the needs of future generations” (WCED, 1987). Unfortunately, this definition is conceptually flawed because it is impossible to know what the preferences of future generations will be. Logically, then, precaution would dictate the preservation of the natural environment in its unaltered state, and we thus arrive at the so-called “strong” definition of sustainability, which is economic development that does not compromise environmental integrity.\* This form of sustainability is probably the most appropriate long-term policy goal (see Smith, 1996a).

---

\* The WCED definition is sometimes referred to as the “weak” definition of sustainable development. This is distinct from the “weak sustainability” criterion of neoclassical–classical economics that permits natural and financial capital to be substitutable, on the assumption that the price of the natural capital reflects its true environmental value (which is rarely the case). The weak definition of sustainable development is more stringent than weak sustainability but may allow it if the price assumption is satisfied. See Gowdy and O’Hara (1995).

In fact, the strong definition of sustainable development can be justified in a second way, more related to current economic conditions. Contrary to prevailing assumptions, the strong definition need not exclude economic growth, as long as that growth is directed toward conserving environmental integrity. Put another way, the “expansionist” interpretation of sustainable development is essentially containable within the strong definition of sustainability, subject to constraints on exactly what is expanded. This interpretation of sustainability has plenty of empirical evidence to support it, but until now very little such evidence has been presented in one place. Much of it comes from developing countries, where economic growth is less universally regarded as the enemy of environmental integrity than in industrialized countries. The present volume describes practical applications toward sustainability emanating from developing countries, informing the concept in ways that are unfamiliar in the industrialized world. It also presents the philosophical underpinnings of sustainability from a developing country point of view and highlights the differences between this view and the “Northern”\* one. Because substantial differences exist between these two points of view, the aim of the present chapter is to use the findings in the rest of the book and elsewhere to begin a synthesis of “Northern” and “Southern” perspectives into a more all-encompassing conception of sustainable development. Of course, if sustainability were achieved, we would probably not be talking about “North” and “South” anyway, but the fact is that pronounced distributional inequities exist between the higher income and lower income countries, as well as significant differences in resource intensity, attitudes toward the environment, and so on. These differences are what motivate the present discussion, but it is hoped that the exercise of an integrated conception of sustainability will eventually eliminate such labels as “North” and “South.” The motivation for the present synthesis is that it might make the operation of international development projects more successful at improving the lives of the people they are supposed to help and that it might address fundamentally why the North has been so slow to become environmentally efficient.

The inspiration for this synthesis comes from evolutionary theory. In the early part of the 20th century, biologists were deeply split over the importance of natural selection as a driving force for evolution. The “naturalists” believed that natural selection was the only important evolutionary force and argued that it did not require a genetic basis. The “geneticists,” by contrast, believed that the only significant force for evolution was genetic mutation: if a mutation had a large enough effect, it would bypass the incremental changes hypothesized by Darwin. In the 1930s and 1940s, a new view emerged that reformulated the

---

\* “Northern” is defined here as countries belonging to the Organization for Economic Co-operation and Development (OECD) and “Southern” as non-OECD countries.

theory of natural selection with a strictly genetic basis. Certain other types of evolution were also hypothesized and later supported by empirical evidence (see Mayr, 1982). Known as the “synthetic” theory of evolution, this formulation has persisted largely intact to the present. That the synthetic theory took 20 years to reach maturity and broad scientific acceptance should make it quite clear that the present synthesis is strictly preliminary. The intention here is to focus attention on the important questions in sustainable development in different places, at different times, and under a variety of circumstances—just as the synthetic theory of evolution provides a broad framework for testing and interpreting biological phenomena. The real value of a synthetic conception of sustainability is its ability to shed light on how to make the best use of all available opportunities. Making sustainability operational is really a matter of predicting and measuring it, far more than just defining it (Costanza and Patten, 1995).

In addition to a synthetic framework, this chapter also presents a simple heuristic to explore from basic principles the conditions required for environmentally sustainable economic development. The main insight of the heuristic is in accord with the synthetic framework: sustainable development may encompass a variety of processes, in different places at different times, including some not usually associated with the conservation of environmental integrity. In particular, economic growth may in fact be not only compatible with sustainability but actually beneficial for it, and the main driving force for sustainability relates to the universe of human technologies.

It is hoped that these two complementary results will provide a powerful impetus for identifying the range of opportunities and constraints for sustainable development on a practical basis as well as a conceptual one. It is also hoped that the *diversity* of theoretical and practical approaches contained herein will make clear the *necessity* of heterogeneous progress toward sustainability. As Kaufmann and Cleveland (1995) correctly point out, “ecological economists need to graduate to a less aggregated, more interdisciplinary and more sophisticated notion of sustainability.”

The present chapter is organized into five subsequent sections. First, the “Northern” perspective on sustainable development is briefly characterized and its main conceptual and practical deficiencies presented. A few brief points are made about why the Northern perspective has dominated efforts to institute sustainability and why it may be incomplete. Second, the main components of a range of contrasting Southern perspectives are presented, drawing on the work in subsequent chapters. These perspectives are critiqued from two Northern standpoints: one expansionist, one precautionist. These two sections then lead into a third, which synthesizes the foregoing perspectives into a conceptual framework and a set of practical prescriptions that address the problem of sustainable development. Fourth, the heuristic for identifying allowable conditions

for sustainability is presented, and its insights are placed within the synthetic formulation. Finally, a set of generalized “signposts” is developed for decision making in a sustainable economy.

## **Sustainable Development as Envisioned in the North**

Martinez-Alier, writing ten years ago, expressed surprise that there are “almost no ecological social movements with roots in the Third World.” In almost the same breath, he expresses puzzlement that “left-wing ecologism has grown...not so much in the Third World as among part of the youth of some of the most over-developed countries” (Martinez-Alier, 1987, pp. 237, 238). The ecological critique of neoclassical economics was already under way in the industrialized countries almost 30 years ago (Boulding, 1966; Daly, 1968; Georgescu-Roegen, 1971), yet only more recently, and especially in the last 10 years, has a strong “ecopopulism” (Martinez-Alier’s term) emerged outside the OECD countries (e.g., Cavalcanti, Chapter 2).

The notion of environmentally sustainable development was promoted in the 1970s most prominently by Herman Daly (1972), who argued that economies should not grow but exist in a dynamically steady state within environmental limits. This is essentially the strong definition of sustainability given previously. To move the debate from the academic to the political arena has, however, required a more politically expedient interpretation of the goal, which is encapsulated in the WCED definition. Many ecological economists maintain that this intergenerational form of sustainability should be treated as really no more than a stepping-stone toward the stricter biophysical form (e.g., Smith, 1996a). However, the fact remains that “sustainable development” as a concept is a product of the North, and this fact prompts two important questions:

1. Why did a similar concept not appear in the South?
2. Is the notion of sustainable development applicable to the South?

Before answering these questions, it is necessary to identify what constitutes sustainable development as seen through Northern eyes. Many of the requirements of sustainability in the Northern vision are replicated in the Southern perspective, as we shall see below, but the emphasis is different. Not all people in the North who believe in sustainable development would necessarily subscribe to the all of following criteria, but by definition they should subscribe to at least one:

1. The intergenerational requirement should be satisfied and, in addition, the more stringent requirement of not breaching biophysical limits should be achieved as soon as possible, regionally, globally, and continuously.



2. The economy should not grow in size, or at most should grow only by a very small amount, over the long term.
3. Discount rates should be abolished in the economy so that a long-term perspective is fostered.
4. Distributional equity should be encouraged, as should a conservationist ethic.
5. Industries and products should be environmentally non-damaging or beneficial, and individuals should choose their professions likewise.
6. Institutional and political changes should be enacted that foster changes in individual attitudes and behaviors toward environmental sustainability.
7. Economic instruments (taxes, quotas, etc.) should be used to regulate economic activity toward the sustainable goal.

Of these criteria, the one that has most pervaded the popular consciousness relates to the environmental soundness of products and the industrial processes that generate them. The label “environmentally friendly” is often financially lucrative for Northern manufacturers, even if a product does not live up to the billing. Conservationist concerns are now widely voiced among the populations of the rich countries, and in some (e.g., the Netherlands), sustainability is beginning to appear in lawmaking. However, most people do not think very much about intergenerational or broader biophysical criteria for sustainability as they relate to everyday life—even though these criteria alone could guide all the others—and attempts by administrations to foster distributional equity have had only limited success, at great fiscal cost. There is no sign of an imminent abolition of discount rates, nor have lawmakers had the courage to alter tax structures so that only environmental “bads” are taxed, and not income or other goods. As for the criterion on economic non-growth, it will be discussed later.

In answer to Martinez-Alier’s question about why a concept of sustainable development did not appear in the South, the answer is probably that this is due to differences in living standards between South and North. Martinez-Alier himself notes in relation to his own “German” political ecologism that “there is some inconsistency about caring for the conservation of world resources while enjoying the average standard of living of prosperous Frankfurt, Amsterdam, or Berlin” (Martinez-Alier, 1987, p. 237). From a simple biological standpoint, once the immediate, internal needs of the individual are assured (i.e., at the most basic level, food and shelter), attention turns to external, more long-term issues (at the basic level, reproduction). In the countries with high average standards of living, it is hardly surprising that some people, after a generation of relative peace since 1945, would become motivated about the poor state of the natural environment and the economic structures that produced it. In the poor countries, by contrast, many people during this period had little time to worry about the

global environment in the face of the struggle to subsist. This explanation, above all others, accounts for most of the differences between the Northern and Southern perspectives on sustainable development, as the next section documents. More interestingly, however, the Southern perspective on sustainable development may in the future *guide* developing economies along new paths toward prosperity which the North has not taken. From the evidence in this book and elsewhere (e.g., Munasinghe, 1993; Munasinghe and McNeely, 1994; Nagpal and Foltz, 1995), there is no reason to suppose that developing countries will follow the traditional development model of heavy industrialization leading to a post-industrial consumer society.

Is the notion of sustainable development applicable to the South? Paradoxically, it is currently being *applied* to the South by the international development banks (e.g., through the Global Environment Facility of the World Bank), but not much in the North, at least in proportion to the use of energy and materials. There are many possible reasons for this. One rather cynical reason might be a fear in the North of industrial competition from the South, which would necessitate maintaining agrarian economies in the South through the influence of appropriate development projects. That there is an *intention* on the part of the international development community to do this, or that that community is heavily influenced by political groups with this intent, is implausible. Another, and contrasting, reason might be the same optimism trap that the expansionists fall into with regard to the North's technical ability to become sustainable. This is the rather arrogant belief that the North could become environmentally sustainable within the time it would take to teach the South how to do it. That the international development community is occasionally capable of blithe faith in the North's technological capacities, as well as its own expertise in fostering sustainable economic development around the world, is entirely plausible. Whatever the reason, however, the imposition of the "new paradigm" of sustainable development has led, in part, to charges of economic colonialism and a partial or complete rejection of the concept in the South (see Chapters 2 and 4). In short, the Northern view of sustainable development is certainly informing the Southern view, but not always in ways the North would like.

The Northern perspective has dominated efforts to institute sustainability mainly because these efforts have focused on industrialized economies (most notably in the Netherlands) and on international projects in developing countries. Southern perspectives have not dominated efforts to institute sustainability because (1) the Southern voice is not heard as often as the Northern one; (2) most people in the South use natural resources at a relatively low intensity, and so are closer to sustainability in some sense anyway; and (3) developing country governments often do not see fit to constrain the improvement of their people's

living standards—by whatever means necessary—while the North fails to enact curbs on its own profligacy.

If the Northern perspective on sustainable development is not easily applicable to the South, is it applicable to the North itself? The answer from the present analysis is a qualified yes, but the Northern perspective is incomplete, and a better job could be done if the North took a few hints from the South. Sustainability is not a homogeneous state, nor is there a single path toward it. The requirements for sustainability vary by developmental state, and the best way to meet these requirements is to share information among regions.

## **Southern Perspectives on Sustainable Development**

### ***Playing “Devil’s Advocate” from Two Northern Standpoints***

The most striking difference between the Southern and Northern perspectives on sustainable development emerging from this book is that the rampant self-interest which has historically characterized economic development in rich countries must be balanced with a stronger sense of community in order for global environmental sustainability to have a chance. A number of authors, especially Cavalcanti (Chapter 2), point to the lifestyles of indigenous peoples as models of environmental sustainability, subservience of individual to community interests, and non-material well-being. The implication of their arguments is that people in industrialized societies cannot achieve all of these things at once—equally because of the environment in which they live and because they have neither the will nor desire for it. Cavalcanti goes further by emphasizing that “not only is sustainability a requirement of the new concept of development, it is also a general prerequisite of life.” On an evolutionary time scale, this is always true because life persists. The logical interpretation is, then, that under a business-as-usual scenario, with no interference, an indigenous lifestyle should outlast a 20th century industrialized one. The tragedy is that if the currently dominant, industrialized model fails as a result of overshooting natural limits for too long, it may take the indigenous one with it.

The Northern response might be: “What can we do?” Kiew (Chapter 4) is disparaging of such words because, to date, they have not been matched by actions. He states that “under the current accounting system, environmental sustainability is meaningless without profit in the financial world which governs the world’s economy.” The expansionist reply might be that financial profit is in our collective interest anyway because greater wealth buys greater environmental protection. This point is not as clear-cut as it seems because of the per-capita costs of that protection, but such an issue is beyond the present scope. At least, according to the expansionist argument, any international imbalance be-

tween the distribution of environmental harm and the costs borne for that harm should even out in the long term as the rest of the world approaches a Northern standard of living through economic growth.

Kiew's comment also alludes to the earlier point about lifestyles: the current accounting system values only profit and nothing else. The Northern expansionist might respond by arguing that a financial measure is preferred because the challenge for development essentially reduces to a valuation question on commodities. The Northern precautionist might invoke a scheme rather like the "biodiversity constraint" of Perrings (1991) or Smith (1996a), but one is still left wondering what form of development the "Southern" perspective desires.

There are, of course, many "Southern" perspectives. Perhaps the greatest misconception that people from industrialized nations could have is that people from poor countries speak with one voice. The multifarious views of the "South" are evident in many contexts in this book, but perhaps most strikingly in relation to the concept of "development" itself. Cavalcanti essentially advocates that communities not be required to "develop" as such, especially when they already live in relative harmony with nature. If environmental sustainability is the goal, then indigenous people are in fact the *most* fully developed along that path. In a sense, Cavalcanti's position can be envisaged as lying at one end of a spectrum of opinion regarding the value of "development," however defined. Other authors in the book sit at different points along this spectrum. Prakash and Gupta (Chapter 3) argue that however human activities change over time, they should be governed by institutional arrangements that are ecologically sustainable. Further, Chopra (Chapter 6) and Toledo (Chapter 11) each show how small-scale harvesting can link to the cash economy and be environmentally sustainable. Many of the other authors address "development" as a supposedly well-defined concept and analyze ways to make it sustainable. Ashley and Barnes (Chapter 8) encapsulate the opposite end of the spectrum from Cavalcanti by stating that "the development process has an important objective: improved livelihoods and opportunities for the historically marginalized poor." There is no right or wrong here—just a set of options whose relative potentials will depend on the specific circumstances.

Are these concepts of development what the people of developing countries want? According to Kiew (personal communication):

The concept of being "developed" is a point of view. The people in the South and the poorer countries are given the impression by the media and their governments that the North is more developed. I personally do not subscribe to this. Otherwise I would have emigrated overseas to some country in the North.

"Develop in what?" is the question to ask. The Penan in Borneo are developed in their life in a rain forest environment. They are

considered undeveloped for city life, a life of industries, trade, and commerce. Judging them in relation to an alien environment makes them *appear* undeveloped.

The North is considered developed due to the aspirations of the people in the South who have not attained these aspirations in terms of material products, technology, and energy use. It is also perceived that the living standards in the North are higher than in the South. People in the North, with their cars and other modern transport facilities, have more and better options in many things they do in life. The poorer people in the South can walk, cycle, or take a boat as their transport option. However, they would love to be able to drive, fly, and surf the Internet.

Kiew asserts in Chapter 9 that economic *growth* is what people in poor countries want: not so much an increase in their country's gross domestic product as an improvement in lifestyle, of which greater buying power is an important part. Moreover, many authors in this book argue that people in poor countries want, for the most part, to increase their well-being sustainably and that the North, by economic and environmental "colonialism," is preventing them from doing so. Moreover, people in the North are enjoying a high standard of living in an environmentally *unsustainable* way.

The potential for economic colonialism may exist not only in the agenda of the international development organizations, as already discussed, but is actually manifested in the international support of economic incentives denying people in poor countries equal competition in international markets. A common side effect is, of course, the degradation of the natural environment (e.g., Southgate, 1995). Yet people and organizations from the North routinely admonish developing countries for not conserving their natural resources, and some even take actions to obstruct the exploitation of those resources. The Northern environmentalist might argue that this so-called "environmental colonialism" is in *everyone's* best interests because poor countries could and should learn from the North's past mistakes. The Northern argument goes further: since the opinion in poor countries is that the North should clean up *its* act before telling others to clean up theirs, then, by the same token, developing countries should clean up their internal institutional and political organizations, because those changes alone would remove many of the economic perversities that obstruct sustainable development.

### ***Issues of Concern***

How do rich and poor regions differ with regard to the perceived issues of concern for individuals? In the rich countries, when the news media cover en-

vironmental issues, they tend to focus on dramatic natural events such as hurricanes, toxic algal blooms, and heat waves. The loss of biodiversity is featured occasionally, but poverty, or the inequitable distribution of wealth among people in different parts of the world, hardly ever appears in the media, except when a region is hit by famine.

This pattern is an example of geographical discounting (Hannon, 1994). The news media naturally cover stories that for the most part affect the people they serve. Global warming is an issue with many facets because it is a phenomenon with multifarious consequences, some of which impinge on the lives of people in industrialized regions. People in the North tend to be concerned about systemic problems in the natural environment because those are the problems that are perceived as threatening. Poverty is not a threat; it is mostly out of sight and therefore out of mind. By contrast, the clear message from this book is that people in poor countries care comparatively little about global warming and other systemic problems because they perceive the improvement of their lifestyles as a more pressing need. This is *temporal* discounting. Recall the earlier biological argument explaining why ecopopulism emerged in wealthy countries rather than poor ones.

The chapters in this volume find specifically that the greatest concerns of people in poor countries are food security, water security, health, education, land tenure, access to markets for their goods, and access to consumer goods, in approximately that order. By contrast, people in the industrialized world are mostly concerned about maintaining their standard of living, which is perceived as coming under attack from competition with emerging economies as well as unpredictable changes in global climate, the depletion of the ozone layer, and, increasingly in the 1990s, the spread of disease. Most indigenous people are, not surprisingly, concerned about preserving their way of life, which does not naturally produce the impacts that the rest of us worry about.

It is no shock to discover that some of the authors in this book argue for the North to do more to help the South develop economically, not by providing aid or loans but by removing barriers to trade and technology. The chapters in this book contain many creative ideas for building wealth without wrecking the natural environment. The problem that the South sees is that the North does not have the motivation to facilitate the successful application of those ideas. As Aguirre (Chapter 5) and others note, many sustainable practices that would generate wealth in the South require economies of scale that current institutional structures would not facilitate. For example, tropical forests valued economically rather than financially would appear a good investment in their intact state because they offer more than just timber (see Chapter 5), but could the sustainable extraction of that timber in one place compete with unsustainable practices elsewhere? Perhaps it could, if demand were managed appropriately, but the

bodies that control international trade are slow to appreciate the potential in the link between trading patterns and sustainable resource use. If the World Trade Organization or other international organizations were ever to initiate a General Agreement on Trade and the Environment (as envisioned by DeBellevue et al. [1995] and Smith [1996a]), or an economic equivalent of CITES\* to regulate the harvesting, production, and pricing of timber (Kiew, personal communication), then such initiatives would require the commitment of the rich countries from the start if they were to have a hope of succeeding worldwide.

Another perceived market distortion from the precautionist point of view is the existence of positive discount rates. Chopra, in Chapter 6, raises the well-known point that markets often do not account for the difference between individuals and society in their valuation of preserving resources for the future. The most widely cited culprit for this market imperfection is the social discount rate, which, it is argued, must be lowered or dispensed with altogether. However, Chopra points out that this type of action would “result in distortions in other investment decisions as well.” She argues that “allowing for a cost of present use is a better method of adjustment” and supports this argument with an analysis of the harvest of non-timber forest products. Chopra’s argument, which echoes Markyanda and Pearce (1991), is that altering discount rates is precisely the kind of crude policy that will fail to provide the right incentives for environmentally sustainable development in any part of the world.

### ***Lessons for the North***

Notwithstanding these international distortions, the prevailing impression from this book is that people in developing countries are pressing ahead with the sustainable creation of wealth with or without external assistance. Chapters 5 to 8 cover financial-economic issues, mainly focused around new ways to value and use natural resources. In addition to the work of Aguirre and Chopra previously discussed, Capistrano et al. (Chapter 7) analyze the prospects for sustainable fisheries in Bangladesh, and Ashley and Barnes (Chapter 8) show in a Namibian study that wildlife tourism is the most profitable and equitable use of land, provided all groups have a stake in the industry.

Chapters 9 to 12 deal with institutional, political, and grass-roots issues. Barrantes (Chapter 9) and Adger (Chapter 10) each show the importance of establishing rights to land, because these rights tie the long-term interests of the landholders to the long-term stability of the land’s natural resources. Toledo (Chapter 11) gives an interesting account of how indigenous and peasant communities in Mexico can and are taking their long-established sustainable practices to the market, thus subverting the traditional process of agricultural mod-

---

\* Convention on International Trade in Endangered Species.

ernization which has, at best, a mixed track record. Finally, Abdalla (Chapter 12) tackles the thorny problem of encouraging economic growth through increased energy use while promoting environmental sustainability. Note that economic *growth* is viewed as desirable, in contrast with the entreaties of Northern precautionists.

Many of the authors in this book strongly encourage community-empowered development as the most effective way to achieve economic and environmental goals. The international development programs of the post-war period are viewed for the most part as how not to encourage development. In Kiew's words (personal communication):

Community-empowered development tends to be more sensitive to the needs of the environment [and] the people. Often in the case of development, the process is initiated from a remote area by a party with no appreciation of the environment to be altered. Colonialism, neo-colonialism or urban-colonialism are all the same in that they lack sensitivity and often are unable to respond to changes in the plan they have initiated. Such management processes lack the ability for appropriate, timely responses to ensure the best of a development project.

In summary, the mix of Southern perspectives on sustainable development de-emphasizes "development" as a centrally planned process and emphasizes community empowerment. Sustainability is seen as a natural adjunct to this empowerment, because the users of resources are responsible for their maintenance. However, remote powers still have a responsibility to provide institutional and political arrangements that facilitate the creation of wealth from intact natural systems rather than from the liquidation of those systems to meet short-term needs. This view is quite distinct from the technocratic "control" mentality that has dominated the international development agencies during the post-war period (see Norgaard, 1994). The message from the South is to let communities develop by themselves but provide them with a level playing field in the international marketplace.

One consequence of this view of sustainable development is that economic growth is often desirable. In fact, the liquidation of some natural capital in order to provide seed financial capital for other projects may also be desirable. The important difference between this process and the elimination of local ecosystems for single industries (e.g., felling rain forest for cattle ranching) is that it takes a long-term view. The ultimate goal under this scheme is, in Cavalcanti's words, to live "within the limits of the possible." One of the first requirements of this goal is the elimination of poverty, a process that usually necessitates economic growth. Cavalcanti (Chapter 2) examines these points in more detail.



Where the Southern and Northern perspectives meet is on distributional equity and the conservationist ethic. The former is seen as a necessary prerequisite for poverty alleviation and the latter is argued to be an attitude whose prevalence in the South is underappreciated in the North. In light of these comparisons, there may be value in a two-way transfer of “technology” between North and South. This would entail not only the transfer of “manipulative” technologies (scientific methods, machines, expertise, etc.) from the North to the South but also the transfer of “intellectual” technologies from South to North. Intellectual technologies would facilitate *thinking* about development in new ways (e.g., placing less emphasis on technocratic “quick fixes” and more emphasis on the power of communities to instigate sustainable practices).

## **A Synthetic Framework for Sustainable Development**

It is clear from the foregoing discussion that the conception of sustainable development that grew out of the challenge to the neoclassical program in the North is not universally applicable, nor is the rather more heterogeneous set of ideas emanating from the South. The synthesis proposed here uses these somewhat differing perspectives to build a more complete vision of the requirements for the transition to, and maintenance of, sustainable economies. A synthetic framework for sustainability would necessarily be an evolving entity since the challenges and opportunities of sustainable development in the future will almost certainly be different from those today. It should be broad enough to frame a wide variety of prescriptions, just as the synthetic theory of natural selection frames a wide range of hypotheses in ecology and evolution.

In fact, the field of ecology itself provides a model for making sustainability operational. Ecology is an empirical discipline: almost all theoretical advancements have come from empirical research and, as a result, the field is composed of a heterogeneous collection of theories that apply to different phenomena at different scales. Unlike economics, where field research is not the main tradition, ecology does not possess a central theoretical core. This is in some ways its strength; like the disaggregated webs of interactions that ecologists study, ecological theory itself forms a web, albeit an incomplete one. The lesson for sustainable development and for ecological economists is twofold. First, we must use field research to guide policy recommendations; sustainability will not be made operational from inside an office. Second, do not be afraid of a disaggregated theory; there is no reason to suppose the existence of a “unifying theory,” and searching for one is probably a waste of time. The research of the authors in this book demonstrates this lesson admirably.

If ecological economics, as the science of sustainability, should be a disag-

gregated theory, what would a synthetic framework for sustainability look like? Given that the goal is biophysical sustainability, any research directed toward that goal should first identify the relevant biophysical constraints and their values and then find ways to maximize social welfare (i.e., financial and non-financial wealth, distributional equity) within these biophysical constraints. In the language of neoclassical economics, this is roughly equivalent to maximizing social welfare subject to constraints, where the primary and overriding constraint is biophysical (i.e., this constraint must be satisfied before all others).

Just as the neo-Darwinian synthesis informs studies of ecology and evolution in almost all contexts, a synthetic framework for sustainability should inform the attainment of the sustainable goal in almost all circumstances. The difference between pure science and ecological economics is that research in ecological economics is issue driven, and therefore the components of a synthetic framework will be prescriptive rather than descriptive or explanatory. However, the essential structure is the same: Given a set of empirical observations, what explanations or prescriptions may be possible? For example, an ecologist might observe apparently altruistic behavior by an individual of one species toward an individual of another. The synthetic theory of evolution would view this as a paradox, which would motivate the researcher to investigate the system further for evidence that the “altruistic” individual is actually benefiting from its actions in terms of increased fitness. In the same way, a development economist might observe that institutional arrangements in a particular region to foster environmental conservation do not have the desired effect, and the people making direct use of environmental services are in fact causing environmental degradation, contravening the goal of environmental sustainability. This paradox should motivate further investigation to discover the source of this disconnect, which might, for example, lie in a lack of communication of the institutional arrangements or their conflict with local customs.

Following the parallel with the neo-Darwinian synthesis further, we can ask what criteria may be important for forming sustainable prescriptions. In ecology and evolution, the criteria that frame a question and permit the formulation of explanatory hypotheses include spatiotemporal scale, biological fitness, genetic polymorphism, primary productivity, social structure, trophic level, and so on. For sustainability, a synthetic framework may make use of:

- Spatiotemporal scale of investigation
- Ecological integrity (as measured by nutrient fluxes, biodiversity, or population sizes)
- Resource intensity of the human system and “balance of accounts” with the natural system
- Perceptions of the natural system by people at the primary level of interaction with it

- Perceptions of people far removed from the natural system
- Cultural norms and customs
- Governmental policies and attitudes within administrations
- Institutional structures
- Economic policies and operation of economic instruments
- Efficacy of communication among sectors of society about policies, institutions, and economic instruments, in terms of both dissipation of information to the populace and feedback to administrations
- Degree of centralization of power (level of community empowerment)
- Degree of corruption in society
- Distribution of wealth and welfare
- Desires of people with regard to wealth and welfare
- People's visions of sustainability

This list is really only a sample of a larger list. The idea is not to produce a complete list but rather to give a sense of the kinds of criteria a synthetic framework might contain. Two important principles emerge. First, this or any other list covers criteria for predicting and prescribing sustainability in both the "Northern" and "Southern" conceptions, and thus is integrative. Second, it is not necessary that every criterion in this synthetic framework be quantifiable. Ecologists, for example, have good reason to be suspicious of attempts by environmental economists to place financial values on species, and anthropologists, ethnographers, and social psychologists have every right to turn up their noses at attempts to quantify the criteria they study. The important task is to identify a set of rules of thumb which when applied consistently should produce approximately consistent outcomes. The interdisciplinary requirements of predicting and measuring sustainability are clear from the breadth of these criteria. As in the employment of the neo-Darwinian synthesis in biology, though, the fundamental concept is very simple: if we characterize the state of a system, what does the synthetic framework, itself derived from a broad empirical base, tell us about that state?

The conception of sustainability offered here integrates the full range of perspectives described earlier. Sustainability would:

- Be biophysically based
- Permit economic growth, in extreme cases through the sacrifice of some natural capital
- Foster distributional equity
- Measure wealth multidimensionally, not just in terms of money
- Promote conservationist ethics
- Empower communities
- Increase efficiency of resource throughput