

# WHAT WORKS

AN ANNOTATED BIBLIOGRAPHY OF CASE STUDIES  
OF SUSTAINABLE DEVELOPMENT

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With a Foreword by Thaddeus C. Trzyna

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# Contents

<b>Foreword</b>	<b>5</b>
<b>Contributions to Future Editions</b>	<b>7</b>
<b>About the Sponsors</b>	<b>7</b>
<b>Introduction</b>	<b>9</b>
<b>Bibliography</b>	<b>11</b>
<b>List of Acronyms</b>	<b>47</b>
<b>List of Publishers</b>	<b>48</b>
<b>Author Index</b>	<b>51</b>
<b>Subject Index</b>	<b>53</b>
<b>Geographic Index</b>	<b>54</b>



# Foreword

One of the privileges of chairing the IUCN Commission on Environmental Strategy and Planning is meeting people from all over the world who are on the front lines of conservation and sustainable development. Invariably, as I talk with them about their work, they express a strongly felt need for models or "success stories." What can they learn from others who are grappling with the same issues elsewhere? How can they avoid making the same mistakes? What works?

Although there is a large and rapidly growing literature on sustainable development, case studies are surprisingly few and often hard to come by. The literature is long on policy proposals, descriptions of projects, and technical guidance, and short on relating practical experience with processes of sustainable development. What case studies do exist are widely dispersed, often in reports and journals that have very limited circulation.

This project had its origins in 1991, when I came across a brief list compiled by Sue Terry, librarian at the World Resources Institute in Washington, entitled "What Works: A Bibliography of Apparent Success Stories in Environmental Management." I asked Scott Slocombe, who chairs the Commission's Working Group on Tools for Sustainability, if he would look into compiling an expanded version of the bibliography. Such a reference was needed, and this seemed to be a good use of the IUCN network. Slocombe, a professor of planning at Wilfrid Laurier University in Canada, consulted with Terry and undertook the project with a small grant from the Commission to cover expenses. Assisted by Lirondel Cheyne and Suzanne den Ouden, he completed a draft manuscript in early 1993. Further research, writing, and the final editing were done by Julie Roelof, my assistant in Sacramento.

Although the original purpose of the project was to gain some bibliographic control over this subject, it has turned out to serve another purpose in identifying a clear need for more and better case studies of efforts toward sustainable development - and more effective ways of communicating them. Much attention is being given to quantitative indicators for measuring progress toward sustainability; much less attention to evaluating activities, sharing experience, and trying to understand what works.

The International Institute for Environment and Development (see, for example, *The Greening of Aid*, entry 31; *The Greening of Africa*, entry 55) and a group of Washington-based non-governmental organizations (*Bankrolling Successes*, entry 107), among others, recognize the need for sharing on-the-ground experience and have taken important steps toward filling it. But much more should be done, and the sustainable develop-

**ment community should experiment with non-print means of communication, including video and computer information technology.**

**My thanks to the authors and all those who helped them put together a very useful reference that I hope will be updated periodically and become a widely used tool for researchers and practitioners alike.**

**THADDEUS C. TRZYNA  
Chairman  
IUCN Commission on Environmental  
Strategy and Planning**

## Contributions to Future Editions

This is the first edition of what is planned to be a continuing publication, revised and expanded every two or three years. Please help us update and improve the bibliography by sending us copies or abstracts of publications that should be included (keeping in mind the criteria given in the introduction). These should be sent to the Editors, *What Works*, care of ICEP, address below. We would greatly appreciate your assistance.

## About the Sponsors

IUCN - The World Conservation Union, formally known as the International Union for Conservation of Nature and Natural Resources, was founded in 1948. IUCN brings together sovereign states, governmental agencies, and a diverse range of non-governmental organizations in a unique world partnership - over 770 members spread across 123 countries. Its mission is to provide leadership and promote a common approach for the world conservation movement in order to safeguard the integrity and diversity of the natural world and to ensure that human use of natural resources is appropriate, sustainable, and equitable. Headquarters: Rue de Mauverney 28, CH-1196 Gland, Switzerland.

The Commission on Environmental Strategy and Planning (CESP) is one of six IUCN commissions that draw together an extensive network of professional volunteers. CESP has some 250 members in 70 countries. It works to improve the formulation, implementation, and evaluation of policies and strategies for environmental protection and sustainable development, and to elaborate and advance a world ethic of living sustainably. Address: P.O. Box 189040, Sacramento, California 95818, USA; or care of IUCN Headquarters.

The International Center for the Environment and Public Policy (ICEP) conducts studies and organizes meetings on environmental and related policy issues; produces publications, including the *World Directory of Environmental Organizations*, a standard reference in the field; and provides staff support to the IUCN Commission on Environmental Strategy and Planning. ICEP is a program of the California Institute of Public Affairs, an affiliate of The Claremont Graduate School, and provides a focus for international activities that the Institute has conducted since 1972. Address: P.O. Box 189040, Sacramento, California 95818, USA.





# Introduction

This is an annotated bibliography of *case studies* of *projects* designed to promote *sustainable development*.

■ By *case studies*, we mean reports that go beyond mere description and include some evaluation or analysis of project results.

■ By *projects*, we mean interventions of all kinds, but particularly those that address problems in a systematic way. There are no minimum size criteria for projects; a small village can offer valuable lessons. There are no maximum size criteria either, although it seems that often the larger the project, the harder it is to assess results.

■ By *sustainable development*, we mean improving the quality of human life while living within the carrying capacity of supporting ecosystems.

This first edition is limited to materials that are wholly or partially devoted to examples from developing countries and developing regions of industrialized countries (this will be reconsidered in preparing the next edition). Whether a project was determined to be a "success" is not a criterion for inclusion; this is usually hard to determine and, in any case, lessons can be learned from failures as well as successes. No project was too old to be included, although almost all the publications listed are from the early 1980s to the present.

Entries are numbered in alphabetical order by principal author. There are indexes of authors, subjects, and places, and a list of acronyms.

The publications described in this bibliography include ephemeral or "gray" material as well as journal articles, books from major publishers, and documents of governments and international agencies. Ease of access to sources is not a factor in selection; the list of publishers preceding the indexes will assist readers in obtaining copies.

The information in this bibliography was gathered from numerous sources. The authors started with Sue Terry's original list. Scott Slocombe, Lironel Cheyne, and Suzanne den Ouden did research in the libraries of the University of Waterloo and Wilfrid Laurier University (Waterloo, Ontario, Canada), searched *Environment Index* and *Geographical Abstracts* for 1970-1991, and examined catalogs of the main publishers active in this field. Slocombe also researched the libraries of IUCN (Gland, Switzerland) and the World Resources Institute (Washington, D.C.).

Julie Roelof searched *International Development Abstracts*, used the library facilities of the University of California at Berkeley and Davis, visited the Center for Development Information and Evaluation of the United States Agency for International Development (Washington, D.C.), and contacted a number of New York-based United Nations agencies. Jeanne X. Kasperson, Research Librarian at the Center for Technology,

Environment, and Development at Clark University (Worcester, Massachusetts), provided extensive information. Richard Sandbrook and his staff at the International Institute for Environment and Development (London) searched among their own numerous publications for titles that fit our criteria, and supplied copies.

An earlier version of the manuscript was reviewed for publication by Sue Terry and two members of the IUCN Commission on Environmental Strategy and Planning: Daniel A. Mazmanian, Director of the Center for Politics and Economics at the Claremont Graduate School in California; and Richard A. Carpenter, then Research Associate at the East-West Center in Hawaii.

Others who assisted included Louis Awanyo, Julie Didion, Maria Kothbauer, Lorrie Krebs, and Jackie McMillan. The authors of this bibliography, of course, bear responsibility for errors and omissions.

A compilation of this kind can never approach completeness, but we hope that by circulating this first edition widely, we will encourage members of the sustainable development community to send us information to make future editions more comprehensive.

We greatly appreciate the help of all those who contributed to this project.

# Bibliography

1. Ade-Oduntola, Kole. 1991. **Success Stories of Women and the Environment: A Preliminary Presentation.** UNEP/WorldWIDE Network, Washington, D.C. 212 pp.

This compilation of one-page descriptions of 212 "success stories" of women and the environment includes a range of projects, resource issues, and countries. Each case study describes the location of the project, the problem it addressed, the solution found, and its impact. A more complete, final compilation is found in volume 2 of Martin-Brown and Ofo-su-Amaah (1992).

2. African Development Foundation. March 1993. **Conservation With Development: The Konta Agro-Forestry Project in Sierra Leone.** ADF Projects In Brief, vol. 2, no. 2. ADF Office of Learning and Dissemination, Washington, D.C.

A project to replace slash-and-burn methods with the intercropping of food staples among trees was conceptualized and initiated by village farmers. In addition to increasing acreage of food crops, some eighty acres of degraded land has been planted with trees. Project membership has increased from the 168 in 1990 to some 400 by early 1993. Despite increased membership, the repayment rate in the credit scheme is still running close to 100 percent. Incomes of participating farmers have risen as has the supply of food in village markets.

3. Altieri, M. A. 1992. **Sustainable Agricultural Development in Latin America: Exploring the Possibilities.** *Agriculture, Ecosystems and Environment* 39(1-2):1-21.

The author concentrates on issues that should be addressed if a productive and sustainable agriculture is to be achieved in Latin America. The attainment of such an agriculture depends

on new technological innovations, policy changes and more socially equitable economic schemes. Using several examples of biological control and integrated pest management programs as case studies, the author explores ways of promoting the transition from chemical-intensive commercial agriculture to low-input management. The paper describes non-governmental efforts using the agroecological approach to help resource-poor farmers, who are mostly confined to marginal soils, hillsides and rainfed areas, to achieve year-round food self-sufficiency, reduce their reliance on scarce and expensive chemical inputs, and develop systems that rebuild the productive capacities of their smallholdings.

4. Ameyaw, S. 1992. **Sustainable Development and the Community: Lessons from the KASHA Project, Botswana.** *Environmentalist* 12(4):267-275.

This paper focuses on the characteristics of sustainable development as manifested in localized contexts and situations. The lessons from the Kang Self Help Association (KASHA) demonstrate how local communities can articulate moral decisions that relate to hunger, famine, drought, poverty, and climatic change while moving toward the goal of sustainable development.

5. Anderson, Anthony B., ed. 1990. **Alternatives to Deforestation: Steps Toward Sustainable Use of the Amazon Rain Forest.** Columbia University Press, New York.

Deforestation in the Amazon is motivated in many cases by short-term gains rather than the long-term productive capacity of the land. As a result, destruction of the region's rain forests usually leaves behind landscapes that are economically as well as ecologically impoverished. This study explores a number of alternatives to the above scenario, many of

which are already practiced by people who live in Amazonia. Main sections cover natural resource management, agroforestry, landscape recovery, and implications for regional development. Chapters are devoted to case studies from Mexico, Peru, Brazil, and Ecuador.

6. Anderson, Dennis. 1987. **The Economics of Afforestation: A Case Study in Africa**. Prepared for the World Bank. Johns Hopkins University Press, Baltimore, Maryland, USA.

Primarily a case study of northern Nigeria, this volume begins with an introductory discussion of the evidence for and policies regarding deforestation in Africa. The case study reviews the current situation and approaches to rural afforestation such as shelterbelts, farm forestry, roadside planting, and the problem of advanced desertification. A cost-benefit analysis is undertaken and the results discussed in terms of the net benefits of afforestation by shelterbelts and farm forestry. Five topics are identified for additional research to strengthen the report's conclusion of net economic benefits from afforestation.

7. Arensberg, W. **Country Environmental Studies: A Framework for Action**. 1992. *Environmental Impact Assessment Review* 12(1-2):155-180.

This paper investigates the state of the art of country environmental studies (CESs). An instrument for fostering improved environment and natural resource management in developing countries, CESs have been used by a growing number of developing country governments, international donors, and non-governmental organizations to identify and analyze environmental issues and define new strategies for sustainable development. The first of three main sections reviews existing information on the number and types of CESs that have been prepared in recent years. The next section offers a preliminary assessment, drawing from existing case studies and informed commentary. A discussion defining

what is generally regarded as good practice in the conduct of these studies is followed by a discussion of future steps to assess their effectiveness.

8. Arledge, Jerome E. 1980. **Soil Conservation at Work: Guatemala's Small Farmer Project**. *Journal of Soil and Water Conservation* 35(4):187-89.

In 1977, the Guatemalan government, with the help of USAID, organized the Small Farmer Conservation Project in two regions of the country's highlands. Unlike previous soil-conservation measures of complex design, this small-scale project lends itself more readily to wide adoption. Initial research identified characteristics of the project area such as extreme slopes, a variety of soil types, and high illiteracy rate among the populace. These findings informed the development of conservation guidelines, educational programs, specific soil conservation methods and evaluation equipment. Contour planting was generally recommended as well as bench terracing for steeper slopes along with the use of mulches. Terracing was particularly well accepted as a conservation practice. Positive visible results have been noted, and the intention of the project is that knowledge of the new methods will spread rapidly by word of mouth.

9. Atthasampunna, Poonsook, and others. 1990. **Cassava Ethanol Pilot Plant: A Demonstration Project for Upgrading of Cassava Wastes and Surpluses by Appropriate Technology**. United Nations Environment Programme, Microbiological Resource Centre (MIRCEN), Bangkok, Thailand.

A recent trade surplus of cassava, one of Thailand's major economic crops, has spurred government measures to promote production of ethanol from cassava. The required production process, however, generates a significant quantity of wastes. The UNEP Microbiological Resource Centre in Bangkok has collaborated with the Thailand Institute of Scientific and Technological Research and the Japanese As-

sociation of Industrial Fermentation in the development of a system for upgrading cassava wastes and surpluses. Successes of this Cassava Ethanol Pilot Plant project include developing a process for anhydrous ethanol from cassava production, developing treatment for wastewater of cassava ethanol production, and finding a market for surplus cassava, cassava pellets, chips and starch by-products.

10. Ayling, R. D. 1988. **International Forestry: Farmers and the Greening of Africa**. *Forestry Chronicle* 64(5):441-3.

Ayling briefly reviews the causes and consequences of tropical deforestation. The traditional response of national governments and international donor agencies has been to invest heavily in large-scale forestry projects, an approach that has often proven ineffective in slowing environmental degradation and/or in bringing benefits to a majority of people affected. The author explores the merits of community-based and controlled programs as an alternative strategy for introducing agroforestry. International Development Research Centre (IDRC) experience with community-based agroforestry in Africa is reviewed.

11. Bannerjee, N. K. 1985. **Women, Participation and Development: A Case Study from West Bengal**. Centre for Women's Development Studies, New Delhi.

This study focuses on a project implemented in a hilly, deforested, and drought-prone district of India. Tribal communities were dependent on seasonal migrant agricultural work. The Gramin Mahila Sramik Unnayan Samiti Project used the landless tribal women's own organization for implementing its employment-generating program. The women responded with collective action which included wasteland development, fodder and fuel cultivation, animal husbandry, and the raising of crops such as medicinal herbs and papaya which could be exchanged for cash. General welfare as well as local environmental conditions improved.

12. Barrett, H. and A. Brown. 1991. **Environmental and Economic Sustainability: Women's Horticultural Production in the Gambia**. *Geography* 76(3):241-248.

Using women's horticultural projects in the Gambia as case studies, this paper contrasts the sustainability of projects with differing approaches to environmental management and technology inputs. An in-depth analysis of one top-down scheme reveals that the associated agricultural practices and irrigation technology make the scheme environmentally and economically unsustainable in the long term. Small-scale projects are found to make better use of women's farming skills but involve greater use of their time and energy. The authors argue that development projects must not undermine the resource base upon which women rely for their livelihoods.

13. Barzetti, Valerie, and Yanina Rovinski, eds. 1992. **Toward a Green Central America**. Kumarian Press, West Hartford, Connecticut, USA. 110 pp. Originally published as **Hacia Una Centroamerica: Seis Casos de Conservacion Integrada**, Stanley Heckadon et al. 1990. Editorial DEI, San Jose, Costa Rica.

This book is based on papers given at the seventeenth IUCN General Assembly, Costa Rica, February 1988. An introductory chapter summarizing the history and current development situation in Central America is followed by six national case studies. The projects described in the case studies are characterized by the fact that they were designed and managed by local organizations. Studies are of the Kuna biosphere reserve in Panama; government and NGO management of the watershed for Tegucigalpa, Honduras; ecotourism in Costa Rica; land reclamation in Nicaragua; the protection and exploitation of El Jocotal Lagoon in El Salvador; and local interaction with the Monterrico Nature Reserve, Guatemala.

14. Bendavid-Val, Avrom. 1987. **More with Less: Managing Energy and Resource Efficient Cities**. United States Agency for In-

ternational Development, Bureau for Science and Technology, Washington, D.C.

In the late 1970s, USAID undertook an action-research and demonstration project concerned with improving energy and resource efficiency in rapidly growing smaller cities. The premise was that smaller cities offered opportunities to build energy and resource efficiency into urban systems that were still in early stages of formation. The Managing Energy and Resource Efficient Cities (MERECE) project began with pilot testing in Tacloban, Philippines, becoming fully operational by mid-1982. During 1983 two more demonstration cities were added: Guarda, Portugal, and Phuket, Thailand. Each city implemented packages of resource-efficiency projects such as biogas digesters, rainwater collection systems, human waste fermentation tanks, master transportation plans, urban agriculture, land use plans, energy auditing, and energy-efficient housing. This document describes experiences from each of the demonstration cities. It concludes by addressing specific questions that might be asked by policy-makers and program managers interested in launching a MERECE-styled program in their own countries.

15. Biswas, Asit K. 1992. **The Aswan High Dam Revisited**. *Ecodecision* (September): 67-69.

At the time of its construction in 1968, the Aswan High Dam in Egypt was widely condemned, eventually becoming a global symbol of the catastrophic environmental and social problems caused by large-scale development projects. Some two decades later, Professor Biswas, an eminent figure in the world development community, believes that the dam is due for a reassessment. According to Biswas, the huge costs of building the dam are estimated to have been recovered within only two years through increases in agricultural production and hydropower generation. The dam also proved its value to the country's economy through years of sustained drought and poten-

tially catastrophic floods. Although there are environmental problems resulting from the dam's construction, many - including riverbed erosion and the effects on fishing - have proved much less severe than at first feared. Others, such as an increase in waterborne diseases, have been shown to be mainly due to lack of sanitation.

16. Borrini, Grazia, ed. April 1991. **Lessons Learned in Community-Based Environmental Management**. Proceedings of the Primary Environmental Care Workshop, Siena, Italy, 29 January - 2 February 1990, International Course for Primary Health Care Managers at District Level in Developing Countries. Istituto Superiore di Sanita, Rome.

These proceedings of the 1990 Primary Environmental Care (PEC) Workshop are divided into four sections. The first includes edited transcripts of the presentations and plenary discussions of the meeting and deals with specific PEC practices in different natural and built environments. The focus is on lessons learned in specific cases, but discussion branches into general conditions for community participation. Section 2 consists of four papers that draw conclusions on the needs and resources of communities in the developing world. Section 3 describes the workshop consensus on a strategy of community-based environmental management. The last section presents a set of conditions for success in PEC, which is based on case studies and experience.

17. Brandon, Katrina, and Michael Wells. 1992. **Planning for People and Parks: Design Dilemmas**. *World Development* 20(4):557-570.

Integrated conservation-development projects (ICDPs) attempt to link biodiversity conservation in protected areas with social and economic development in surrounding communities. The performance of ICDPs thus far has been hampered by numerous difficulties, many of which are strikingly similar to those encountered in rural development ef-

forts. While many of these difficulties can be traced to specific design or implementation flaws, more fundamental conceptual issues pose a challenge for the approach. This paper highlights the evolution and performance of these projects thus far, and the conceptual trade-offs inherent in linking conservation and development.

18. Browder, John O., ed. 1989. **Fragile Lands of Latin America: Strategies for Sustainable Development**. Westview, Boulder, Colorado, USA. 301 pp.

This collection of papers describes experiences with non-conventional strategies for natural resource development and management in regions of Brazil, Colombia, Ecuador, Mexico, and Peru. There are introductory papers on the nature of fragile lands and the role of development and technology transfer. Case study papers cover tropical rainforests, sustainable agriculture in Andean Highlands and desert streambeds, and research in progress.

19. Bryant, Jenny J. 1989. **Environmental Education in the South Pacific: Towards Sustainable Development**. *Environmentalist* 9(1):45-54.

The South Pacific region is characterized by the variety of natural and physical features and, in the author's opinion, by the urgent need for preservation and conservation. There is a regional environmental program and a treaty signed between nine Pacific Island governments and the United States, France, New Zealand and the United Kingdom. However, environmental education has received low financial support. The article describes environmental education as it appears in community education, primary schools, secondary schools, tertiary institutions, and government departments, committees and legislation. An overview of the success of existing programs and their effects on sustainable development concludes the paper.

20. Budowski, Gerardo. 1988. **Is Sustain-**

**able Harvest Possible in the Tropics?** *American Forests* 94(11):34-7, 79-81. ✓

The author contends that the forestry industry has limited knowledge of complex tropical forest ecosystems and has made little effort to regenerate destroyed tropical forests, despite existence of tested methods for sustainable harvesting. Secondary forest management is illustrated in Costa Rica's Florencia Sur Experimental Forest, where valuable species flourish in an area salvaged from a coffee field. In Sarapique, Costa Rica, Dr. Gary Hartshorn has developed a technique of clearcutting in small strips, which allows gaps to close and regenerate fully. In Suriname, silvicultural treatments over a twenty-year period, with the subsequent harvesting of 20 cubic meter areas, allow the natural forest to maintain its essential functions. The Chimanes permanent production forest in Amazonian Bolivia has sustained yield as its goal, while providing a livelihood for the local native Indians. Tropical flooded forests, where only a few species proliferate, can be naturally regenerated with very simple silvicultural techniques. The author calls for incentives for widespread implementation of these methods, which can be financially self-sustaining in the long term.

21. Bunch, Roland. 1990. **Low Input Soil Restoration in Honduras: The Cantarranas Farmer-to-Farmer Extension Programme**. Gatekeeper Series in Sustainable Agriculture, no. 23. IIED Publications, London. 12 pp.

The Cantarranas Integrated Development Program is a sustainable agriculture program in Honduras founded by World Neighbors together with Catholic Relief Services and ACORDE, a Honduran NGO. With soil restoration identified as the most important challenge to agriculture in the region, research emphasis was placed on the use of available organic additives. The innovative extension program provides no subsidies or giveaways, encouraging farmers instead to experiment with new fertilizing methods on small private lots and to adopt methods only if they see a

clear advantage. Local farmers, as opposed to outside specialists, teach classes and share knowledge with their neighbors. After three and a half years, the Cantarranas program has involved over 600 families and has helped farmers to increase their yields by as much as threefold.

22. Butera, F. M. 1989. **Renewable Energy Sources in Developing Countries: Successes and Failures in Technology Transfer and Diffusion.** Consiglio Nazionale delle Ricerche. Progetto Finalizzato Energetica, Rome. 143 pp.

This study focuses on the socio-cultural, economic and environmental impact of renewable energy technologies in developing countries. A case-study approach is used to generate a methodological framework for reducing the failure rate of development projects. Cases include: energy for cook stoves in Guatemala, Nepal, Senegal, India, Kenya, and Indonesia; energy for water pumping in Argentina, India, and the Philippines; and energy to improve production and quality of life, including a solar drier project in Micronesia and a village mini-hydro system in Pakistan. The author concludes that western science and know-how can be implemented in developing countries, but they must be adjusted and made compatible with the receiving system. The model used to implement western technology must be an interpretive one that responds to unpredictable factors and changing circumstances.

23. Carpenter, Richard A., and David E. Harper. 1989. **Towards a Science of Sustainable Upland Management in Developing Countries.** *Environmental Management* 13(1): 43-54.

Sloping uplands and watersheds in many tropical developing countries are increasingly being cultivated, logged, or used as rangeland without adequate understanding of ecological cause-effect relationships. Multinational collaboration between American and Southeast Asian scientists has been initiated to test two different hypotheses for achieving sustainabil-

ity in upland management practices in developing countries. The first hypothesis is that recent results of ecological research could be applied to uplands management and the second is that statistically reliable data can be obtained from experiments in upland situations, although variations in natural conditions are great. Research to study and test the hypotheses is underway in the Philippines, Taiwan and Thailand. It is hoped that by obtaining the necessary quantitative information, policy makers and farmers will be better able to develop and implement upland management practices. Findings by the researchers to date are provided in the article.

24. Carr, Marilyn, ed. 1988. **Sustainable Industrial Development: Seven Case Studies.** Intermediate Technology Publications, London.

Despite the size and importance of the small-scale industry sector in developing countries, relatively little attention has been given to creating the sort of economic environment in which it can flourish. Five of the seven case studies in this book deal with this relatively neglected sector. One relates to the production of a consumer durable good (ceramic jiko stoves in Kenya), and four relate to the production of capital goods aimed primarily at small-scale food production and crop- or food-processing units (fishing boats in south India, sorghum mills in Botswana, water mills in Nepal, and light engineering in Ghana). Of the two case studies which look at medium- and large-scale industry, one deals with the production of an essential commodity (cement in India) and the other with the local processing of a raw material for export (wood pulp in Swaziland). In both cases, adaptation of technology to local circumstances has led to increased social and economic benefits.

25. Centre for Environmental Management and Planning. January 1985. **Strategies for Environmentally Sound Development in the Mining and Energy Industries: Crete Seminar Recommendations,** University of Aberdeen, Old Aberdeen, Scotland. 41 pp.



This is the report of a workshop that drew almost 50 papers, most of them involving case studies or describing environmental assessment practices in seven broad themes. The seminar worked with seven discussion groups which ultimately produced recommendations for the framework within which environmental management should operate; the environmental assessment phase of the pre-planning of projects; and ongoing environmental management associated with the life of the project.

26. Center for International Development and Environment. 1993. **Farmer Innovation in Natural Resource Management: Water Management in Msanzi, Tanzania**. World Resources Institute, Washington, D.C. 34 pp.

Msanzi village is located in the Rukwa Region in southwest Tanzania. Lacking traditional export crops as well as economic and social infrastructure, this region is one of the least developed in the country. This case study chronicles how Msanzi villagers have successfully managed their water supply and irrigation system to maximize agricultural potential despite a variety of serious, long-term ecological problems. It discusses the implications of the Msanzi experience for the development of other small-scale irrigation projects and recommends strategies for assisting rural communities in the sustainable management of their natural resources.

27. Chew, Siew Tuan. April 1990. **Natural Resource Management: Issues and Lessons from Rwanda**. Occasional Paper vol. 35. United States Agency for International Development, Washington, D.C. 22 pp.

USAID is working with other donors and the government of Rwanda to identify and resolve problems associated with natural resource management in that country. USAID/Rwanda, a small mission with a direct-hire professional staff of seven people, relates its experience with small-scale resource management projects that promote agricultural development and protection of remaining forests.

28. Chew, Siew Tuan. October 1990. **Natural Resource Management: A.I.D.'s Experience in Nepal**. Occasional Paper vol. 41. United States Agency for International Development, Washington, D.C. 17 pp.

Since 1980, USAID has invested seventy-seven million dollars in seven projects that deal with environmental aspects of agricultural production and watershed management in the hilly regions of Nepal. This paper reviews USAID/Nepal's efforts to deal with issues that emerged during the implementation of the two largest projects in the mission, the Rapti Development Project and the Resource Conservation and Development Project. The paper also describes USAID/Nepal's participation in multidonor strategies to address forestry issues that cannot be adequately resolved by a single donor or by the host country alone.

29. Clark University Program for International Development. 1988. **Resources Management, Population, and Local Institutions in Katheka: A Case Study of Effective Natural Resources Management in Machakos, Kenya**. Clark University, Worcester, Massachusetts, USA.

This document summarizes research carried out jointly by the Kenyan Ministry of Environment and Natural Resources, the Kenyan National Environmental Secretariat, and the Clark University International Development Program. The experience of this case study suggests that there is untapped potential in local communities and that increasing attention to village institutions for managing natural resources will yield sustainable results. The study in Katheka illustrates how the village can be an effective organizational unit, fostering participation in project planning and implementation. Villagers understand the relationship between improved natural resource management and sustainable food production; organizational structures are already in place, methodologies are known and costs are low. The case study supports information dissemination through a sequence of village

visitations and demonstrates what can be accomplished with small amounts of external inputs. The research also describes methodologies and procedures available in the Kenyan example for village-based natural resources management programs, including funding, technologies and technical assistance.

30. Cook, Cynthia C., and Mikael Grut. 1989. **Agroforestry in Sub-Saharan Africa: A Farmer's Perspective**. World Bank Technical Paper no. 112. World Bank, Washington, D.C. 94 pp.

Agroforestry is not new to Africa, for many traditional farming systems include elements of agroforestry. At the same time, research programs are yielding new technologies that can make such systems considerably more productive. This study was carried out jointly by the Environment and Agriculture Divisions of the Technical Department, Africa Region of the World Bank. Its objective was to contribute to the integration of new knowledge with that already possessed by farmers as a means of improving present welfare and future prospects for sustainable economic growth. During the first phase of the study, a literature search and interviews were conducted to identify available information on factors affecting farmer adoption, as well as on cases of reported success. The sample of cases to be covered in depth were selected on the basis of (1) representation from both East and West Africa; (2) examples of indigenous agroforestry systems and of instances where new systems were introduced from the outside; and (3) representation from three different ecological zones (the humid lowlands, the semi-arid lowlands, and the cool highlands). The seven case studies that appear in this report are the CARE/Kenya Agroforestry Extension project; Chagga homegardens, Tanzania; the Agro-Pastoral Project, Rwanda; alley farming in western Nigeria; *Acacia al-bida* in southeast Niger; and Majjia Valley windbreaks. Concluding chapters identify technical, economic, social, institutional, and research priority issues.

31. Conroy, Czech, and Miles Litvinoff, eds. 1988. **The Greening of Aid: Sustainable Livelihoods in Practice**. International Institute for Environment and Development, Earthscan Publications, London. 302 pp.

The thirty-four case studies in this collection are grouped by subject area, including sustainable rural livelihoods, appropriate technology and industry, planning techniques for sustainable development, human and institutional development, and human settlements. Thematic and analytical essays precede each main section. The case studies are:

- Philip von Mehren and John Seo, "Lampang Applied Nutrition Program, Thailand"
- P. R. Mishra and Madhu Sarin, "Social Security through Social Fencing, Sukhomajri and Nada, North India"
- Tom Arens and Gopal Nakarmi, "Baudha-Bahunipati Family Welfare Project, Nepal"
- Stephan Morrissey, "Tin Aicha, Mali"
- Roland Bunch, "Guinope Integrated Development Program, Honduras"
- Jan Wind and Effendy A. Sumardja, "World Bank Irrigation and Water-Catchment Protection Project, Dumoga, Indonesia"
- Norman Hudson, "Soil Conservation Programme, Kenya"
- Robert Cottingham, "Dry-Season Gardening Projects, Haiti"
- Chris Reij, "Soil and Water Conservation in Yatenga, Burkina Faso"
- Frederick J. Conway, "Agroforestry Outreach Project, Haiti"
- John Kurien, "Kerala Fishing-Boat Project, India"
- Drummond Hislop, "Micro-Hydro Systems Manufacture and Use"
- Monica Opole, "Improved Charcoal Stoves Programme"
- Julian Evans and David Wright, "Usutu Forest Pulp Mill, Swaziland"
- O. G. Schmidt, "Sorghum Processing, Botswana"
- Ian Smillie, "Transfer of Sustainable Appropriate Technology, Ghana"
- Sanjay Sinha, "Small Versus Large in the Indian Cement Industry"
- Richard Saunier, "Integrated Regional Development Planning, Santiago and Mira River Basins, Ecuador"

- Joseph A. Tosi Jr., "Land Capability Classification Based on the World Life Zone System, Bolivia"
- Dennis McCaffrey, "Country Environmental Profile, Paraguay"
- Gordon R. Conway, Tariq Husain, Zahur Alam, and M. Alim Mian, "Rapid Rural Appraisal for Sustainable Development, the Northern Areas of Pakistan"
- Stephan M. J. Bass, "National Conservation Strategy, Zambia"
- International Fund for Agricultural Development, "Grameen Bank, Bangladesh, and Small Farmer Development Project, Nepal"
- Horacio Ornes, "Community Training Centres for Organic Agriculture and Appropriate Technology, Dominican Republic"
- Thomas W. Dichter, "Business Advisory Services to Small Enterprises and Local NGOs, Kenya and Ghana"
- D. R. Mellors, "Integrated Rural Development Programme, Serenje, Mpika, and Chinsali, Zambia"
- Arthur Hanson, "Environmental Management Development, Indonesia"
- Robin Bidwell, John Horberry, and David Gettman, "Implementing Environmental Programmes - Why It Is Difficult and How to Make It Easier"
- Arif Hasan, "Orangi Pilot Project, Karachi, Pakistan"
- Centro Cooperativista Uruguayo, "Mutual Aid Co-operative Movement, Uruguay"
- Rocio Lombera, "Union de Palo Alto Co-operative, Mexico"
- Harrington E. Jere, "Chawama Upgrading, Lusaka, Zambia"
- Petter Myhren, "Integrated Community Development Project, Addis Ababa, Ethiopia"

32. Cowan, Margaret E., and William B. Stapp, eds. October 1982. **International Case Studies in Environmental Education**. Environmental Education in Action, no. 5. ERIC Clearinghouse for Science, Mathematics, and Environmental Education, Columbus, Ohio, USA. 308 pp.

Provided in this document are case studies of representative and exemplary innovative environmental education programs from various regions of the world (North America, Latin

America, Western Europe, Eastern Europe, Africa, Asia, and Australia/Oceania). The case studies provide information on the environmental problems and concerns of various countries, insights into that country's attitude toward the environment and education, and models of programs created for that country's situation. Many of the studies incorporated international cooperation or a global perspective. The opening section provides a philosophical overview of the topic. Major sections which follow address multinational, national, community, and single-institution programs. Case studies are also categorized in a matrix found in the introduction to the document. Programs are arranged by world region, target audience, environmental/education emphasis, and sponsor.

33. Critchley, Will. 1991. **Looking After Our Land: Soil and Water Conservation in Dryland Africa**. Arid Lands Information Network/Drylands Programme, International Institute for Environment and Development. Oxfam Publications, Oxford. 84 pp.

In late 1989, the Arid Lands Information Network based at Oxfam and the Drylands programme at IIED began collaboration on the production of a video to address the unmet need for resource material on soil and water conservation by and for development workers at the project level. This book stems from the accompanying notes from that ninety-minute video. Intended for use in workshops or discussion groups as well as for the general reader concerned with environmental issues, the analysis contains main lessons to be learned from new approaches to soil and water conservation in sub-Saharan Africa. It presents six case studies, two each from Burkina Faso, Kenya, and Mali, where conservation projects based on the participation of the local people have resulted in some success.

34. Dankelman, Irene, and Joan Davidson. 1988. **Women and Environment in the Third World: Alliance for the Future**. Earthscan Publications, London. 210 pp.

The first part of this book explores the relationships between women, environment and natural resources with emphases on food, water, forest, energy, and human settlements. The second part looks at women and environmental conservation: those working for it, those training them, family planning, women organizing themselves, and the international response. A majority of each chapter consists of case studies from Africa, Latin America, India and Pakistan.

35. Dorm-Adzobu, Clement, Okyeame Ampadu-Agyei, and Peter G. Veit. July 1991. **Religious Beliefs and Environmental Protection: The Malshegu Sacred Grove in Northern Ghana.** World Resources Institute, Washington, D.C. and African Centre for Technology Studies, Nairobi. 35 pp.

This case study describes the nearly three centuries-long history of protection of a small forest grove near the Malshegu community in Ghana. The grove is believed to house a local spirit and has been protected by the community's traditional beliefs, embodied in a religious priest charged with protecting the god's abode. Three elements stand out as central to Malshegu's success in protecting the forest: resolute belief that the grove provides sanctuary to the local god; degradation of sacred groves in surrounding areas which has increased the importance of the grove in question; and local people's adherence to centuries-old regulations for using and protecting the grove. Specific policy recommendations to promote government decentralization and local protection of ecosystems are provided in a concluding section.

36. Dorm-Adzobu, Clement, Okyeame Ampadu-Agyei, and Peter G. Veit. April 1991. **Community Institutions in Resource Management: Agroforestry by Mobisquads in Ghana.** World Resources Institute, Washington, D.C. and African Centre for Technology Studies, Nairobi. 36 pp.

This report describes a local self-development

cooperative initiated by the government in Goviefe-Agodome, Volta Region, Ghana, which has turned land once considered infertile into productive farmland through various agroforestry practices. Some of the proceeds from the communally run farms are used for community development activities; the rest is divided equally among members. The report attributes the success of this effort to four elements: actions were designed, implemented, and managed by a local organization acceptable to the community, with the support of local leaders and institutions; agroforestry yielded immediate financial and other benefits to cooperative members and their households; the resource management activities were locally sustainable and involved practices and techniques familiar to the members; and the community has benefitted from access to major urban areas and assistance in its development activities. General policy and programming recommendations are presented.

37. Dyasi, Hubert M. 1985. **Culture and the Environment in Ghana.** *Environmental Management* 9(2):97-104.

Dyasi discusses and contrasts environmental management in Ghana under traditional cultural norms and under modern western practices. Acceptable environmental management resulted from traditional strictures and taboos. Western industrial practices and population growth led to the transformation of production methods and subsequent environmental damage. Ghana's recent environmental policies seek to integrate traditional knowledge with science and technology. However, even with extensive research efforts and a viable policy framework, it seems that pressing economic problems will take precedence over wise environmental practices.

38. Erskine, J. M. 1991. **Agroforestry: Its Development as a Sustainable, Productive Land-use System for Low-resource Farmers in Southern Africa.** *Forest Ecology and Management* 45(1-4):281-291.

Focusing on Southern Africa, this article identifies constraints and policy issues that must be addressed before the potential contribution of agroforestry to sustainable development can be realized. Based on a review of past successful and unsuccessful experiences in agroforestry, the discussion focuses on the importance of government policies, including land tenure; incentives for tree-planting; the training and staffing of extension services; communication and coordination among personnel; and site-specific research needed to adapt agroforestry principles to the wide range of social and ecological conditions encountered in developing areas.

39. Evan, Harry Zvi. 1977. **Environmental Management in a Mediterranean Port City: Haifa**. *Ambio* 6(6):346-9.

The highly polluted metropolitan Haifa area in Israel was selected for a three-year experimental project co-sponsored by the UNEP Environmental Fund, the national Environmental Protection Service, and the Haifa municipality. The objective was to improve environmental quality and to test ecosystem management methods with possible applicability to other Mediterranean port cities. Strategies involved a multi-disciplinary staff and an integrated-systems approach to the urban environment, taking into account development needs as well as environmental goals. Tasks are discussed under the headings of air-quality management, basin management, the industrial program, solid waste disposal, beach pollution, urban planning, and information and legislation. At the end of the second year, direct impact on the physical environment was still quite limited. The main achievement thus far was a decentralized management unit for environmental protection, a first for an Israeli city. On an international level, the project could provide insights into complex ecological and social systems and achieving environmental goals without hampering economic development.

40. Fals-Borda, Orlando and M. Anisur

Rahman, eds. 1991. **Action and Knowledge: Breaking the Monopoly with Participatory Action-Research**. Apex Horizons, New York.

The authors describe the philosophy and techniques of Participatory Action Research (PAR), drawing on their own field experience over twenty years. The approach involves actively engaging people in generating knowledge about their own condition and how it may be changed. Goals include providing liberating knowledge and political empowerment. Parts 1 and 2 of the booklet are theoretical discussions pertinent to scholars. Part 2 of the document is a collection of process studies from selected countries illustrating viable approaches.

41. Ford, Richard, and Francis Lelo. 1991. **Evaluating Participatory Rural Appraisal: Listening to Village Leaders in Kakuyuni Location**. *Papers in International Development and Social Change*, no. 2. Clark University, Worcester, Massachusetts, USA.

In June 1990 a three-day workshop was convened in Kakuyuni Location, Kenya, to carry out an "in the field" evaluation of the Participatory Rural Appraisal (PRA) approach. It was attended by community leaders, technical extension officers, and staff members of NGOs. The discussions centered around the experiences of two years of PRA activity in Kakuyuni. The main conclusions from this workshop are presented here. The strengths and weaknesses of PRA are outlined and the future areas of work to improve this approach are presented.

42. van de Flert, Elske, and Yunita T. Winarto. July 1993. **From Technological Packages to Ecological Principles**. *ILEIA Newsletter* 9(2):16-18.

One of the most-cited programs on Integrated Pest Management was implemented with support from the Food and Agriculture Organization of the United Nations in Indonesia. While successes in terms of numbers of farmers

trained are well-documented, the authors have gone beyond earlier evaluations and studied the impact of this activity at field and village level. Important changes are taking place as a result of the program, but many other factors and interests also influence farmers. Good "after-the-training" programs are therefore recommended.

43. Freeman, Peter H. and Tomas B. Fricke. 1983. **Traditional Agriculture in Sahella: A Successful Way to Live.** *Ecologist* 13(6):208-12.

Two case studies are extracted from the authors' report to the World Bank on ecological soundness and adaptability of traditional agricultural practices. The rotation of *Acacia senegal* with pearl millet in the Sudan and of *Acacia dalbida* with pearl millet in Senegal were studied. Each case highlights reasons for the success of the traditional strategy.

44. Garcia-Zamor, Jean-Claude, ed. 1985. **Public Participation in Development Planning and Management: Cases from Africa and Asia.** Westview Press, Boulder, Colorado, USA. 264 pp.

General papers introduce participative planning and management, the rationale for and problems of reorienting bureaucratic performance, and methods for institutionalizing participative planning and management in developing countries. There is a select bibliography on participative planning and management. Most of the book is comprised of overviews and case studies illustrating experience in Asia and Africa. Case studies are of rural development, agriculture and food, irrigation, village services, and water management in the Sahel, West Africa, Egypt, Sri Lanka, the Philippines, Bangladesh, and Yemen.

45. Gerden, C. A., and S. Mtallo. 1990. **Traditional Forest Reserves in Babati District, Tanzania: A Study in Human Ecology.** International Rural Development Centre, Working Paper no. 128. Swedish University of Agricul-

tural Sciences, Uppsala, Sweden.

One of the new strategies of the Tanzanian National Community Forestry Programme is to encourage improved management of natural woodlands as an alternative to treeplanting activities. During the initial phase of Forests, Trees and People (a daughter project under FAO auspices) a base-line study was undertaken in the project villages. To the surprise of the extension workers, forest areas protected for generations by cultural beliefs existed in three of the four villages. This study reports findings on the cultural beliefs and practices concerning Traditional Forest Reserves (TFR). Many of the areas studied are used by (sometimes secret) groups for traditional ceremonies. The fact that many of the TFR are on slopes and hills and surround natural springs in an indication of their ecological importance. Researchers experienced a few examples where the government forester had used the TFR institution in the course of implementing the Community Forestry Programme. The report gives suggestions on how such a cooperation can be undertaken in the future - at least to liaise with the "traditional foresters" in the local societies.

46. Ghai, Dharam. June 1988. **Participatory Development: Some Perspectives from Grassroots Experiences.** United Nations Research Institute for Social Development Discussion Paper vol. 5. UNRISD, Geneva. 32 pp.

The purpose of this paper is to explore the differing notions of participation and development as conceived of by a variety of organizations and specialists. It examines different levels of participatory development and identifies characteristics of a participatory approach based on empowerment of excluded social groups. A study of nine selected grassroots initiatives in Asian and African countries illustrates perspectives on development characterized by a self-reliant, egalitarian, and participatory approach.

47. Gibson, David C., and Eva U. Miller.

August 1987. **Diagnostic Surveys and Management Information Systems in Agroforestry Project Implementation: A Case Study from Rwanda.** International Council for Research in Agroforestry (ICRAF), Nairobi, Kenya. 81 pp.

This working paper describes the use of a diagnostically based Information Management System (IMS) in the CARE Gituza Forestry Project in Rwanda. A microcomputer-based IMS can facilitate the diagnostic and design process, comprising part of a project's "internal guidance system." In this case, an IMS was developed to monitor and supply information about an agricultural extension service. Of specific interest was the service's ability to respond in a sustainable way to farmer-identified needs. Findings were incorporated directly into day-to-day management decisions as well as into the agroforestry extension training curriculum. One year's use suggests a significant positive impact on farming practices. Ongoing participation from project beneficiaries has also been facilitated. Future papers in the series will review examples of other Information Management Systems in practice.

48. Gischler, Christian, and C. F. Jauregui. 1984. **Low-Cost Techniques for Water Conservation and Management in Latin America.** *Nature and Resources* 20(3):11-18.

This paper describes UNESCO's activities to improve living conditions in rural communities of Latin America. The authors describe and discuss several of the twenty-one pilot projects in a number of different countries. The projects are based on the La Paz Model of integrated development conceptualized during the Sixth Meeting of the Standing Conference on National Science and Technology Policy-Making Bodies in Latin America and the Caribbean convened by UNESCO in La Paz, Bolivia, in October 1981. This methodology integrates traditional materials and knowledge with modern technology to solve local problems.

49. Gomez-Pompa, A., T. C. Whitmore, and M. Hadley, eds. 1991. **Rain Forest Regeneration and Management.** Parthenon Publishing, Park Ridge, New Jersey, USA. 457 pp.

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This is a comprehensive work with eight general chapters on varied aspects of the management and ecology of natural tropical forests and twenty-four case studies of forest ecology, research, traditional knowledge, management and regeneration. Countries included among the case studies are the Andaman Islands (India), Australia, Borneo, Brazil, Colombia, Cote d'Ivoire, Cuba, French Guiana, India, Indonesia, Malaysia, Mexico, Nigeria, Papua New Guinea, Sri Lanka, Suriname, and Venezuela.

50. Gradwohl, Judith and Russell Greenberg. 1988. **Saving the Tropical Forests.** Earthscan, London. 207 pp.

A short introduction explaining the extent, causes, and consequences of tropical deforestation is followed by almost forty case studies of successful efforts to halt, slow, or recover from tropical deforestation. The case studies are grouped under headings of forest reserves, sustainable agriculture, natural forest management, and tropical forest restoration. Case studies come from Belize, Brazil, Cameroon, China, Colombia, Costa Rica, Ecuador, Haiti, Indonesia, Mexico, Papua New Guinea, Panama, Peru, the Philippines, Suriname, Thailand, and Uganda.

51. de Groot, Peter, Alison Field-Juma, and David O. Hall. 1992. **Taking Root: Revegetation in Semi-Arid Kenya.** African Centre for Technical Studies (ACTS)/Biomass Users Network. ACTS Press, Nairobi, Kenya.

This book describes the importance of increasing biomass production, from the global need for carbon dioxide fixing to the local needs for fuel, fodder, and soil conservation. Its case study of the Baringo Fuel and Fodder project (BFFP) illustrates the challenges of revegetation and points out possible solutions

to the complex questions of community development and changing resource use patterns. The authors believe that the BFFP's experience demonstrates how increasing biomass production provides the basis for sound economic development of a semi-arid area.

52. Gupta, Avijit. 1988. **Ecology and Development in the Third World**. Routledge, London. 88 pp.

An introduction to ecology and development that highlights the links between environmental degradation, population pressure, and global economic development. Chapters focus on development and natural vegetation, impacts of land development, development of water resources, development and air quality, urban development, and development and environmental protection. There are short case studies from the Amazon Basin, Egypt, El Salvador, India, Jamaica, and Thailand.

53. Hanrahan, Michael, and others. September 1990. **Strategic Environmental and Natural Resources Planning: Hypotheses, Case Studies, and Policy Conclusions from Latin America and the Caribbean**. Development Strategies for Fragile Lands (DESFIL), United States Agency for International Development, Washington, D.C. 36 pp.

Development Strategies for Fragile Lands (DESFIL) is a project funded by USAID's Bureau for Science and Technology and Latin America and Caribbean Branch. The report is a synthesis of three long-term DESFIL strategic projects in environment and natural resources planning. The authors define a strategic plan and then go on to outline a general strategic plan for the sites. The authors argue that strategic plans can only bring about actions and influence policies if they are used to shape public debate, set priorities, coordinate actions of diverse agencies, set common agendas and provide coordinated and concerted action.

54. Hansen, Michael. 1986. **Escape from**

**the Pesticide Treadmill: Alternatives to Pesticides in Developing Countries**. Consumer's Union, Institute for Consumer Policy Research, Mount Vernon, New York, USA. 185 pp.

Hansen targets the danger of over-reliance on pesticides and presents case studies of farmers who have successfully reduced or abandoned chemical pesticide use. Information on pest control alternatives is provided. A common theme in the case studies is the integrated pest management approach, which views the agrosystem as an interrelated whole and aims to maximize natural mortality of pests while minimizing pesticide use. The author devotes a chapter each to examples of integrated pest management in protecting South Pacific coconut palms from the rhinoceros beetle, Philippine rice from the brown plant hopper, African cassava plants from the cassava mealybug, and Costa Rican bananas and Nicaraguan cotton from scores of pest species.

55. Harrison, Paul. 1987. **The Greening of Africa: Breaking through in the Battle for Land and Food**. Paladin Grafton Books, London. 380 pp.

Commissioned by the International Institute for Environment and Development, this report focuses on success stories that belie the pessimism surrounding modern-day Africa. Implications for the aid process are explored. The core of the book describes initiatives for boosting food production, conserving soil and water, reclaiming land, managing forests, livestock, and human resources, and mobilizing for change. Final chapters summarize the secrets of success and the prospects for the future. Lessons learned point to the importance of participation, empiricism, and flexibility in project design; low-risk enterprise; the spreading of information; and sensitivity to the political context. A two-page checklist of best practice is provided.

56. Harrison, Paul. 1987. **Trees for Africa**. *New Scientist* 114(1560):54-7.



Two new strategies, local management of natural forests and agroforestry, offer hope for Africa's rapidly disappearing forests. International development agencies have had some success through involving local people in the management of small-scale regeneration projects from which they may also reap the benefits of forest products. Agroforestry can more effectively counteract the gradual clearance of natural forests for cropland. Projects in agroforestry have proven effective both in increasing crop yields and in providing the benefits of forest products. The International Commission for Research in Agroforestry (ICRAF) has been active in developing research methods and information exchange, however, there is still a great need for more research in agroforestry.

57. Hartshorn, Gary S. 1989. **Application of Gap Theory to Tropical Forest Management: Natural Regeneration on Strip Clear-cuts in the Peruvian Amazon.** *Ecology* 70(3):567-569.

Hartshorn gives a concise review of the failings of traditional tropical forest management and explores the potential for sustained timber yields from heterogenous tropical forests using narrow, strip clear-cuts. This method is intended to promote natural revegetation of native tree species. The article summarizes results from a forest management project in the Palcazu valley of eastern Peru designed to test the strip clear-cut method. The abundance and diversity of tree regeneration on two test strips demonstrate the excellent regenerative capacity of tropical forests when artificial openings simulate openings produced by natural processes.

58. Heckman, Joanne. 1985. **Culture and the Environment on the Cape Verde Islands.** *Environmental Management* 9(2):141-50. An island ecology of limited flora and fauna existed in Cape Verde prior to the Portuguese arrival in 1460. Widespread deforestation and overfarming in the centuries since have led to erosion and barrenness. Nearly one million

people reside on the islands and are largely dependent on foreign aid. The long-term survival of human inhabitants on the archipelago will depend on the artificial introduction of an ecosystem more diversified, stable, and productive than ever existed in the past. Current initiatives include improving agricultural methods, introducing new crops and livestock, and promoting water and soil conservation. Under the best of conditions, the island could still only produce forty per cent of the population's food needs. Diversifying the economic base with enterprises such as tourism, light industry, and services could be encouraged. The islands' future will depend on the success of ameliorating environmental problems, improving farming, and diversifying the economic base.

59. Hough, John L. 1989. **Bottom-up versus Basic Needs: Integrating Conservation and Development in the Annapurna and Michiru Mountain Conservation Areas of Nepal and Malawi.** *Ambio* 18(8):434-441.

The Annapurna Conservation Area in Nepal and the Michiri Mountain Conservation Area in Malawi exemplify contrasting approaches to involving local people in conservation and development activities. The Annapurna project encourages community participation in a decentralized decision-making process, while the Michiri project allows for local representation in a centralized process. Project outcomes are compared in the framework of the bottom-up versus basic needs debate. The former approach, exemplified by the Annapurna project, succeeds in fostering local self-determination and self-reliance but can compromise conservation goals. The basic needs approach, represented by the Michiri project, is found to ensure the best technical solution but ignores the development of local capacity and incentives for long-term participation and stability.

60. Hyman, Eric L. 1987. **The Strategy of Production and Distribution of Improved Charcoal Stoves in Kenya.** *World Development* 15(3):375-386.

The article describes a program which disseminated over 125,000 fuel-efficient, ceramic-lined charcoal stoves for household cooking in Kenya. The program is thought to have been relatively successful for several reasons. First, the stove was fashioned after the traditional stove and incorporated improved features from experience in another developing country. Second, extensive field testing informed a series of modifications and created an evolution in the stove's design. Finally, the private and informal sectors were involved in the production and distribution process. Conclusions note recent innovations and the need to improve consumer acceptance, quality control and worker productivity.

61. International Council for Local Environmental Initiatives (ICLEI). 1992. **Instructions for a Sustainable Future: Final Report of the UNCED Local Government Honours Programme**. ICLEI, Toronto, Ontario. 44 pp.

Projects in twelve countries in both developed and developing countries are profiled in 2-3 page vignettes. A "Why it Worked" section concludes each chapter. The report is in English but includes Spanish and French summaries of each profile.

62. International Development Research Centre and Swedish Agency for Research Cooperation with Developing Countries. 1991. **Research: Knowledge in the Pursuit of Change**. IDRC, Ottawa. 79 pp.

An illustrated, popular review of achievements in development research supported by Canada's IDRC and Sweden's SAREC. Twenty-eight short case studies are given on improving health, increasing the food supply, rural development and the environment, putting technology to work, and the human side of science.

63. Ishwaran, Natarajan, and W. Erdelen. 1990. **Conserving Sinharaja: An Experiment in Sustainable Development in Sri Lanka**. *Ambio* 19(5):237-44.

This article reviews the ecosystem characteristics and management history of the Sinharaja Reserve, and Sri Lanka's wet forest zone in general. In 1988 Sinharaja became Sri Lanka's first Natural Wilderness Heritage Area. It is the country's least disturbed and most extensive patch of lowland rain forest, and a Biosphere Reserve and World Heritage Site. The primary objective of the current conservation strategy is sustainable development of buffer and peripheral zones around the reserve which are essential to the long-term success of the Sinharaja project. Financial assistance from NORAD and technical assistance from IUCN are assisting implementation of extension schemes, environmental education programs and co-ordination of a decentralized decision-making process.

64. Jasanoff, Sheila. 1986. **Managing India's Environment**. *Environment* 28(8):12-16, 31-38.

Jasanoff reports on Indian environmental management in the post-Bhopal era. Topics covered include the present condition of that country's environment; the legal and institutional framework for environmental management; new legislation and the existing barriers to implementation; and the unique strengths that characterizes the Indian population. These strengths include an abundance of expertise, a strong environmental consciousness, high government commitment, and a multitude of citizen groups. A range of examples of NGO activities and successes are described.

65. Jeffers, J. N. R. 1992. **Pastoralism in Transition**. Parthenon Publishing, Park Ridge, New Jersey, USA.

This is a summary of the results of a fifteen-year study of the interlocked aspects of pastoralism in arid and semi-arid regions in northern Kenya. Pastoralism, the history of attempts to improve conditions for pastoralists, and social, economic and ecological conditions are reviewed and discussed. Jeffers describes the implementation of solutions to the prob-

lems faced by nomadic shepherds and goatherds. Solutions fall under the rubrics of modelling and conflict resolution; infrastructure; planning and conduct of scientific research, training, and education; and evaluation of the roles of various groups including government, missionaries, and aid agencies.

66. Jodha, N. S., M. Banskota, and Tej Partap, eds. 1992. **Sustainable Mountain Agriculture: Perspectives and Issues**. 2 vols. International Centre for Integrated Mountain Development, Kathmandu. Oxford and IBH Publishing, New Delhi.

The papers in this book cover various dimensions of mountain agriculture in the overall context of development strategies, experiences, problems, and prospects, with special focus on the Hindu Kush-Himalayan region. The full collection of papers is divided into two volumes, published simultaneously. Volume 1 contains thematic papers on perspectives and approaches, issues in long-term sustainability of mountain agriculture, and agro-ecological zonation approaches to mountain development. Volume 2 covers operational dimensions of the subject, reporting and analyzing micro-level or project-level realities, experiences, and implications. "Transformation of Mountain Areas: Some Innovative Approaches" is the heading for the second part of volume 2. It contains the following program-based case studies:

- Gao Hongbin and Ye Xingqing, "Anti-poverty Focussed Programmes in the Mountains: Experiences in China"
- L. R. Verma and T. Partap, "The Experiences of an Area-based Development Strategy in Himachal Pradesh, India"
- Liu Zhaoguang and Wu Ning, "A Local Resource-Centred Approach to Rural Transformation: Agro-based Cottage Industries in Western Sichuan, China"
- K. S. Sharma, "The Small Farmers' Development Programme in Nepal: Institutional Initiative in Poverty Alleviation"
- T. Husain, "The Aga Khan Rural Support Programme: An Approach to Village Management Systems in Northern Pakistan"
- B. Pound, K. Budathoki, and B. R. Joshi, "Mountain Agricultural Technology Develop-

ment and Diffusion: The Lumle Model, Nepal"  
■ S. P. Chand and B. Thapa, "Mountain Agricultural Technology Development and Diffusion: The Pakhribas Model, Nepal"

67. Jordan, William R., III. 1987. **Restorationists: Making a User-friendly National Park for Costa Rica: A Visit with Daniel Janzen**. *Restoration and Management Notes* 5(2):72-75.

This article is based on an interview with Daniel Janzen, the ecologist from the University of Pennsylvania responsible for initiating the Guanacaste National Park project. The project involves restoring an immense tract of dry tropical forest along the Pacific coast of Costa Rica. Guanacaste offers a model of environmental restoration that is sensitive to both the natural ecology of the area and its cultural context. Cultural restoration is a key approach and involves raising social consciousness, using the park as an educational center for local citizens, and generating income for locals from visiting researchers and students.

68. Kabutha, Charity, Barbara P. Thomas-Slayter, and Richard Ford. 1991. **Assessing Mbusyani: Using Participatory Rural Appraisal for Sustainable Resources Management**. *Papers in International Development and Social Change*, no. 1. Clark University, Worcester, Massachusetts, USA.

The narrative portion of this case study describes how a team consisting of staff from the Kenyan government, Clark University's Program for International Development, and field-based technical officers engaged local leaders to assess problems and develop a village plan of action. The methodology used - Participatory Rural Appraisal - builds on earlier approaches such as Rapid Rural Appraisal. Since the adoption of the Village Resource Management Plan in Mbusyani, local groups, in association with government extension officers and NGOs, have rehabilitated wells, terraced hillslopes, constructed cutoff drains, obtained handtools, installed a grain grinding

mill, and rehabilitated and fenced one reservoir catchment area. Working in association with an NGO, village groups have raised funds to hire heavy equipment to desilt two reservoirs. Three years after the original PRA, energy and activity for improved resources production continue.

69. Kabuye, Christine. 1993. **The Indigenous Food Plants Program of Kenya**. International Institute of Rural Reconstruction, Silang, Cavite, Philippines.

The Indigenous Food Plants Program (IFPP), part of two complementary centers at the National Museums of Kenya, aims to improve diets as well as preserve cultural practices and biodiversity. Since its inception, it has involved rural communities, first as sources of information on food plants, and later, as promoters of the same foods on a larger scale in their communities. So far, several local species of vegetables and fruit trees have been found to be marketable. Promotional activities involve setting up demonstration gardens at museums; providing educational materials on focal species; supplying seeds to schools and communities; encouraging projects on wild food plants; holding training and promotional workshops; disseminating the latest research findings; and participating in agricultural and world food days.

70. Katz, Andrea. 1987. **The Role of Aquaculture in Nepal: Towards Sustainable Development**. *Ambio* 16(4):222-4.

Aquaculture holds promise as an environmentally viable means of intensifying food production. Aquaculture experiments are being conducted in Nepal, where population-induced strain on available cropland and natural fisheries has led to protein deficiency among inhabitants. Nepal has learned much from Chinese polyculture and, with assistance from the FAO/UNDP Aquaculture Development and Coordination Program for Asia, a system of Fisheries Development Centres has been established. The project has its drawbacks - no-

tably, the introduction of exotic species, a lack of infrastructure development, and a tendency to encourage export production rather than self-sufficiency.

71. Kemf, Elizabeth. 1988. **The Re-greening of Vietnam**. *New Scientist* 118(1618):53-7.

Vietnam's environment was left devastated after thirty years of war. A large percentage of the tropical forest was destroyed and the new government is faced with the task of rehabilitating this vital ecosystem. After twelve years of experimentation, the replanting of tropical forests is succeeding. It is the first successful tropical reforestation effort conducted anywhere in the world, and it has succeeded on a very small budget. Exotic species were first planted to provide shelter for the dipterocarp seedlings. After more than a decade of trial and error, several species have been found to survive. This project offers hope for other countries but also demonstrates how difficult rehabilitation can be. The mangrove forests which were most seriously affected in the war have also been the most difficult to restore. Currently, Vietnamese scientists have drafted a national plan that emphasizes two immediate measures: a massive reforestation program and a large-scale family planning program.

72. Kerkhof, Paul. 1990. **Agroforestry in Africa: a Survey of Project Experience**. Panos Institute, London. 216 pp.

Agroforestry is still a new discipline and this book offers a mechanism for disseminating project techniques, approaches and success stories. A survey of the experiences from twenty-one projects in eleven countries throughout Africa covers a range of ecological conditions and agroforestry approaches. Kerkhof focuses whenever possible on the people most directly involved in design and implementation. Part 1 of the publication summarizes overall lessons that have emerged from experience to date. Part 2 presents profiles of individual projects from Burkina Faso,

Cameroon, Ethiopia, Kenya, Mali, Niger, Rwanda, Senegal, Tanzania, Zambia, and Zimbabwe. Part 3 provides information on different approaches to project design and implementation including technical packages, extension techniques, production and distribution of seedlings, and measuring project success and failure.

73. Kleymeyer, Charles D. 1992. **Cultural Energy and Grassroots Development**. *Grassroots Development* 16(1):22-31.

Kleymeyer uses case material reported in more than a decade of *Grassroots Development* and draws on the broader Inter-American Foundation (IAF) experience in its analysis of cultural energy, seen to be a key to the kind of social mobilization that drives successful grassroots projects. The author finds cultural energy to be a powerful force in the creation and reinforcement of group solidarity, organizational efficacy, and participative and volunteer spirit. The article focuses, in particular, on the experience of two IAF-funded development projects among the Aymara and Mapuche people in Chile. Strategies for tapping cultural energy and encouraging cultural expression are also discussed.

74. Kwapena, Navu. 1984. **Traditional Conservation and Utilization of Wildlife in Papua New Guinea**. *Environmentalist* 4(Supplement 7): 22-6.

The article reviews several traditional methods of wildlife harvesting and conservation, the present situation, new wildlife resource problems such as habitat loss, and potential ways to encourage and regulate traditional conservation practices using existing legislation. Wildlife Management Areas initiated at landowner request are given particular attention as having potential to retain traditional wildlife conservation practices while preventing further habitat destruction.

75. Lal, Rattan, and F. J. Pierce, eds. 1991. **Soil Management for Sustainability**. Soil

and Water Conservation Society, Ankeny, Iowa, USA.

These papers from a workshop at the Soil and Water Conservation Society's 1989 Conference in Edmonton, Alberta, Canada provide a comprehensive review of the roles of soil science, farming practices, input management, and agricultural research and policy in the search for sustainability. Examples are drawn from many countries. A final chapter summarizes and synthesizes management needs and possibilities.

76. Leach, Gerald, and Robin Mearns. 1989. **Beyond the Woodfuel Crisis: People, Land and Trees in Africa**. Earthscan Publications, London. 320 pp.

Farmers scratching a living from parched land, women walking miles for firewood are familiar images of Africa. But in many places, people, with the help of governments and aid agencies, are rehabilitating the land, growing more food, and recreating a healthy cover of trees. Leach and Mearns look at these advances from the viewpoint of the energy crisis of the poor. The case studies in this book illustrate gains that have come about through programs that focus on local needs and capacities to manage fuel resources sustainably.

77. Lee, Kai N. 1989. **The Columbia River Basin: Experimenting with Sustainability**. *Environment* 31(6):6-11, 30-33. ✓

The challenge of institutionalizing sustainable development is the main focus of this article. The primary governing principle of past development along the Columbia River was the maximization of economic return from energy generation, with fish and wildlife protection and interaction with native groups a secondary concern. In 1986 the Northwest Power Act was passed in an attempt to mitigate the effects of industrial development on fish and wildlife habitats. Ongoing projects include both the enhancement of fish populations by artificial means and improving natural spawn-

ing habitats, as well as monitoring the migration of fish and prohibiting any new hydro development. The act is seen as a step toward sustainable development, but a complex bureaucracy involving eleven state and federal agencies, thirteen native groups and eight utilities makes the implementation of mandates difficult. The Columbia River case illustrates two problems challenging sustainability: moral viability in terms of affordability for the poor and institutional complexity. The article highlights two critical elements in the quest for sustainability in the Colombia River Basin: adaptive management, which entails a comprehensive ecosystem perspective, and negotiation to address institutional complexity and include extensive social interaction in open political settings.

78. Lele, Uma. 1975. **The Design of Rural Development: Lessons from Africa**. Johns Hopkins University Press, Baltimore, Maryland, USA. 246 pp.

This book begins with an overview of the nature and magnitude of rural development problems in Africa. Following chapters document the nature of production systems; agricultural extension and user participation, agricultural credit, marketing output, and social services; forms of rural development administration (autonomous and nationally planned projects); and training for rural development. A final chapter reviews these topics and provides concise recommendations for designing rural development projects. Specific case-studies from Cameroon, Ethiopia, Malawi, Mali, Nigeria, and Tanzania are reported in seven brief appendices.

79. Lowe, R. G. 1977. **Experience with the Tropical Shelterwood System of Regeneration in National Forests in Nigeria**. *Forest Ecology and Management* 1(3):193-212.

The Nigerian Tropical Shelterwood System was implemented in western and mid-western Nigeria in the 1950s, ultimately involving about 200,000 hectares of forest. It was in-

tended to generate sustained or improved yields of the primary economic species which were earmarked for the export market. Earnings from forest exploitation would finance improved regeneration practices which involved creating canopy openings to encourage natural regeneration. The system was abandoned primarily because it did not make sufficiently intensive use of the land to compete with other forms of exploitation. This case holds lessons for the current situation in Nigeria, as people turn to intensive forestry to meet home-building requirements. Currently desired levels of forest production will require planting and considerable capital investment to avoid running down the productive capacity.

80. Lucas, P. H. C. 1992. **Protected Landscapes: A Guide for Policy-Makers and Planners**. Chapman and Hall, London. 297 pp.

This book introduces the concept of "protected landscapes" and how they work as a tool for environmental conservation. Landscapes represent interfaces between culture and nature, as they entail the whole ecology of an area and the history of its occupation and use by people. Topics include: protected landscapes' contributions to sustainability and international cooperation; the selection and valuation of protected landscapes; legal, administrative, and management principles; and the benefits of protection gained by local residents. A special section provides case studies of existing protected areas in Australia, China, France, Japan, Martinique, Nepal, New Zealand, Poland, Tanzania, the UK, and the USA.

81. Martin-Brown, Joan and Waafas Ofo-su-Amaah, eds. 1992. **Proceedings of the Global Assembly of Women and the Environment "Partners in Life"**, 2 vols. UN Environment Programme/WorldWIDE, Washington, D.C.

Volume 1 includes the history of the Assembly, keynote speeches, global overview presentations, a list of the final 218 "success stories" presented at the meeting, closing presentations, and summary findings and recommen-

dations. Volume 2 presents the "success story" case studies in full.

82. McNeely, Jeffrey A. 1988. **Economics and Biological Diversity: Developing and Using Economic Incentives to Conserve Biological Resources**. IUCN-The World Conservation Union, Gland, Switzerland. 236 pp.

According to McNeely, human decision-making is inevitably based on economic thinking, irrespective of whether it is labeled as such. This document aims to demonstrate the benefits of linking economics more explicitly with the conservation of biological diversity. The thematic portion of the book covers the values and benefits of biological diversity, the nature of economic incentives, international aspects, and funding mechanisms. A set of guidelines provide advice on how incentives packages can be designed and implemented by resource management agencies and how specific projects interventions can be most effective. The final chapter consists of twenty-five one- and two-page summaries of case studies from countries in Africa, East Asia, the Americas, Australia, and the Arctic. Three introductory studies demonstrate results of perverse economic incentives, while the remainder are illustrative of successful use of incentives at either community, national, or international levels.

83. Mehra, Rekha, Margaret Alcott, and Nilda S. Baling. 1993. **Women's Participation in the Cogtong Bay Mangrove Management Project: A Case Study**. International Center for Research on Women (ICRW), Washington, D.C.

This study, a collaborative effort of ICRW and the World Wildlife Fund (WWF), focuses on women's roles and involvement in the Cogtong Bay Project in the Philippines. The project sought to improve management of coastal resources in a resource-depleted area by forming community associations whose members would assume collective responsibility for preventing illegal fishing, for reforestation of mangroves,

and for building of artificial reefs. Technical assistance for commercial oyster and mussel cultivation and land tenure awards over mangrove areas were also provided. The research team found that although women had been largely overlooked in the design of the project, they attended meetings, became officers, made decisions, and undertook project activities. Women were effectively excluded, however, from project benefits, such as tenure over mangrove areas, formal membership in associations, and credit. The report summarizes lessons learned and includes interview questionnaires and materials from a gender training workshop based on the case study.

84. Meier, P., and M. Munasinghe. 1987. **Implementing a Practical Fuelwood Conservation Policy: The Case of Sri Lanka**. *Energy Policy* 15(2):125-34.

High demand for fuelwood in Sri Lanka threatens devastating long-term economic, environmental and social consequences. In 1983 the Sri Lankan government initiated National Fuelwood Conservation Programme (NFCP), components of which included promoting fuelwood-efficient cookstoves and conducting research to evaluate existing programs, policies, and inputs. The analysis justified continuation of the cookstove project and also for accelerated plantation efforts, a conclusion likely to extend to other countries. It is still early to judge the success of the NFCP; what can be observed at this point are the institutional reforms set in place and a policy consensus in favor of the program found throughout the levels of government.

85. Mishra, Hemanta R. 1982. **Balancing Human Needs and Conservation in Nepal's Royal Chitwan Park**. *Ambio* 11(5):246-51. Article traces the history of interactions between Royal Chitwan National Park authorities and surrounding villagers. While the park is touted for its success in restoring depleted rhino and tiger populations, expected benefits from tourism have not materialized, and local resentment has grown. Specific complaints in-

clude denial of access to natural resources found in the park and loss of livestock and crops to the preserve's wild animals. Since 1977, park authorities in Chitwan have assembled villagers, teachers, and community leaders once a year to discuss the problems of the local people and the needs of the park. Results of this effort have been improved relations among the parties and the granting of permits allowing villagers to enter the park each year to collect grass for building materials.

86. Moldenhauer, W. C. and N. W. Hudson, eds. 1988. **Conservation Farming on Steep Lands**. Soil and Water Conservation Society, Ankeny, Iowa, USA.

The proceedings of a 1987 workshop in San Juan, Puerto Rico offer a wide-ranging review of principles and programs, social and economic issues, and practices and prospects related to conservation and farming. There are case studies throughout and in a special section with articles focused on Cape Verde, Dominican Republic, Honduras, Indonesia, Jamaica, Kenya, Malawi, Peru, and Taiwan. The range of issues covered includes the technical, economic, social, and educational aspects of conservation farming.

87. National Research Council, Commission on Life Sciences, Committee on Applications of Ecological Theory to Environmental Problems. 1986. **Ecological Knowledge and Environmental Problem Solving: Concepts and Case Studies**. National Academy Press, Washington, D.C.

Ecological knowledge, as defined by the author, is comprised of theory, facts, observations, research results, syntheses, models and methods of investigation. Ecological knowledge is important in developing approaches to a wide range of environmental problems. This report applies the concept to prediction and management of environmental impacts, management of renewable resources, protection and restoration of species and ecosystems, control of agricultural and silvicultural pests,

and use of generic ecological studies to promote understanding. Thirteen selected case studies illustrate successful applications of the ecological knowledge concept and its value when used appropriately.

88. Nations, James D., Bruce B. Burwell, and Gary R. Burniske. 1987. **We Did This Ourselves: A Case Study of the INAFOR/CARE/Peace Corps Soil Conservation and Forest Management Program, Republic of Guatemala**. Produced under the USAID/Peace Corps Forest Resources Management Project. 63 pp.

This case study is based on a 1987 field team visit of the INAFOR/CARE/Peace Corps Soil Conservation and Management Program. The program focuses on improving subsistence farming using two methods: farm tree-planting and intra-soil conservation techniques that increase and sustain yields. These techniques have achieved visible success due to the adaptability of the conservation systems, extension efforts, and a cooperative effort on the part of the three complementary organizations. Positive impacts on communities and on personnel of the institutions involved are also described.

89. Newmark, William D., ed. 1991. **The Conservation of Mount Kilimanjaro**. IUCN Forest Conservation Programme, Gland, Switzerland. 136 pp.

These are the proceedings of a symposium that explored the status, threats and conservation of the Mount Kilimanjaro ecosystem in Tanzania and Kenya. Topics covered include demographic growth, tourism trends and impacts to agricultural changes, and integrated research, monitoring and management systems. Successful local initiatives such as social forestry and anti-poaching movements are described. Priorities and recommendations are developed throughout and summarized in a final chapter.

90. Nijkamp, P., C. J. M. Van den Bergh



and F. J. Soeteman. 1991. **Regional Sustainable Development and Natural Resource Use**. In: *Proceedings of the World Bank Annual Conference on Development Economics, 1990*, edited by S. Fischer and others. World Bank, Washington, D.C. pp 153-188.

Regional Sustainable Development (RSD) is the notion of making sustainable development planning operational on a regional scale. Implicit in RSD is that it should always be compatible with global sustainability; and RSD of all regions of a spatial system implies sustainable development for the system as a whole. Topics covered include the process for identifying critical success factors and the notion of sustainable resource use. The paper critically evaluates RSD models with regard to their design, specification, and use. In addition, three case studies demonstrate application of the concepts of regional sustainable development, critical success factors, and sustainable resource use. Case studies are taken from the Peel area in the Netherlands, the Sporades Islands in Greece, and rural land in Botswana.

91. Novikoff, Georges and Mohamed Skouri. 1981. **Balancing Development and Conservation in Pre-Saharan Tunisia**. *Ambio* 10(2-3):135-41.

Tunisian Ministry of Agriculture efforts to restore ecological balance and combat desertification have resulted in two projects: a Research and Development Project for Rangelands in South Central Tunisia (a joint project of UNDP/FAO/UNESCO) and a Desert Biome Project under the International Biological Programme. Project goals are to improve knowledge of desert fringe ecosystems and to formulate management methods to ensure rational multiple-use of land. Both studies have been incorporated into the UNESCO Man and Biosphere program and are an example of MAB's efforts to apply research to critical environment and development problems. Research results are summarized under main themes: primary productivity as a basis for range management planning, studies of effects

of grazing practices on vegetation and soil desertification and ways to combat it, and preparation of management proposals, taking into account ecological and socio-economic factors. The implementation of objectives began in 1976 and it is hoped that, in the final analysis, projects will provide guidance for a comprehensive land-use policy.

92. Oakley, Peter. 1991. **Projects with People: the Practice of Participation in Rural Development**. International Labour Organisation (ILO), Geneva.

This study was carried out with the financial support of four member agencies of the Panel on People's Participation, an inter-agency body of the United Nations Task Force on Rural Development. The book builds on an earlier publication entitled *Approaches to Participation in Rural Development*, by Peter Oakley and David Marsden (Geneva, ILO, 1984), and various workshops and meetings organized around this issue. The author presents a selection of case studies drawn from the three developing regions of the world, highlighting the methodological approach applied in promoting participation within a variety of sectoral, institutional, and policy settings.

93. Okafor, J. C. 1977. **Development of Forest Tree Crops for Food Supplies in Nigeria**. *Forest Ecology and Management* 1(3):235-47.

Okafor reviews the history and experience of a pioneer project on the edible forest trees of Nigeria. Their economic importance, socioeconomic value, distribution in natural forests and in farming systems, and propagation were studied. Problems besetting their development are enumerated. Needs for interdisciplinary collaboration, conservation of genetic resources, and development of mechanical methods for harvesting, processing, preservation, and storage are highlighted.

94. Oldfield, Margery L. and Janis B. Al-

corn, eds. 1991. **Biodiversity: Culture, Conservation, and Ecodevelopment**. Westview Press, Boulder, Colorado, USA. 349 pp.

This collection of papers is devoted to the field dimension of biodiversity. An introductory paper by Raymond F. Dasmann outlines the importance of cultural and biological diversity. Other papers recount field experience in assessing and preserving biodiversity under the broad headings of genetic resources and culture, traditional conservation and use of biodiversity, and biodiversity conservation and eco-development. Countries covered include Colombia, Czech Republic, Ecuador, Mexico, Namibia, Panama, Slovakia, and Sudan.

95. Oram, Peter A. 1988. **Moving Toward Sustainability: Building the Agro-ecological Framework**. *Environment* 30(9):14-17, 30-35.

Environmental problems are multi-faceted and require collaboration from a variety of disciplines. The agroecological framework combines the disciplines of ecology, population dynamics, and socio-economics for the purpose of tailoring agricultural technology and management to specific environments. The Food and Agriculture Organization (FAO) of the United Nations launched a pioneering Agricultural Zones Project in 1978, and the Centro Internacional de Agricultura Tropical (CIAT) undertook a similar project. The FAO project in particular has been adopted and modified by a number of national and international agencies. The project uses a wide range of characterization techniques, requiring a large amount of data and the use of complex databases and GIS systems. The framework can be a valuable and flexible tool for sustainable agriculture, through its assessment of the nature and potential of croplands.

96. Overholt, Catherine, and others, eds. 1985. **Gender Roles in Development Projects: A Case Book**. Kumarian Press, Westport, Connecticut, USA. 326 pp.

This volume presents materials from the first

phase of a training project of the Harvard Institute for International Development. The case studies stem from a collaboration with the Women in Development Office of USAID. The report is divided into two sections. The first consists of technical papers: *Women in Development: A Framework for Project Analysis*, *Women's Productivity in Agricultural Systems: Considerations for Project Design*, *Technology Transfer: Implications for Women*, and *Small-Scale Enterprise for Women*. The second section of the document provides case studies based on actual country projects which received USAID funds. The cases are designed as learning tools for practitioners and are intended for use as vehicles for group discussion.

97. Paaby, D., and others. 1991. **Training Rural Residents as Naturalist Guides: Evaluation of a Pilot Project in Costa Rica**. *Conservation Biology* 5(4):542-546.

The majority of guides working in the international tourism industry in this country are either bilingual Costa Rican urbanites or foreigners. In either case, the money earned from these relatively well-paid jobs remains in the cities. This article describes a pilot project to increase the economic returns of natural history tourism in rural areas by training local residents as naturalist guides. The object was not to replace the current guide system, but rather to create local specialists who could work in concert with the existing bilingual guides. An additional goal of this project was to develop a local body of conservation advocates. Thus, the course design included basic issues in natural resource management, as well as local history, ecology, and field-guiding techniques. One criticism of the program was a missed opportunity to focus training on birdlife and the English language, since many ecotourists are birdwatchers from English-speaking countries.

98. Palm, Ola, and Klas Sandell. 1989. **Sustainable Agriculture and Nitrogen Supply in Sri Lanka: Farmers' and Scientists' Per-**

spective. *Ambio* 18(8):442-448.

The sustainability of agricultural development has long been neglected due to short-term perspectives and the striking productivity achieved during the green revolution. This is the case even concerning the supply of nutrients. Heavy usage of chemical fertilizers involves large amounts of non-renewable energy resources for production, as well as for the operation of distribution systems. This paper presents findings of a joint Sri Lankan-Swedish research project on low-resource agriculture. Specifically, the team investigated paddy-rice cultivation in five villages in the dry zone of Sri Lanka. The team used an interdisciplinary approach that involved documenting local farmers' practices and perceptions of various forms of nutrient inputs. Results pointed in favor of an integration of industrial and biofertilizers.

99. Panos Institute. 1991. **Whose Trees? A People's View of Forestry Aid.** Panos Publications, London. 143 pp.

To what extent did three different forestry projects in Sudan, Nepal, and Tanzania succeed in involving and meeting the needs of the local people? This book, funded by the Finnish aid agency FINNIDA, tries to answer this question, describes past errors, and provides the villagers' perspectives on sustainable forestry. Lessons on balancing environmental, social, and economic stability are drawn.

100. Paskett, Curtis J., and C. E. Philoctete. 1990. **Soil Conservation in Haiti.** *Journal of Soil and Water Conservation* 45(4):457-60.

Five centuries of land degradation pose a serious threat to the Haitian agricultural economy. The Targeted Watershed Management Project is a soil conservation strategy involving 198,000 acres south and west of Pic Macaya. Sponsored by USAID, the project aims to increase soil organic matter, implement contour tillage, and improve soil coverage. The program operates through four Haitian NGOs and

a U.S. university. An initial soil inventory showed that while in a few sites soil had reached the point of no return, a large proportion of the area could be saved. The technologies currently being introduced are not ideal in terms of fulfilling all the requirements for sustainability, but they will gain time until a more appropriate approach is developed. The authors argue that continuing support for the program is essential not only for the sake of Haiti, but for other developing nations that find themselves in a similar predicament.

101. Paul, Anne-Marie Fati. 1989. **Women, Environment and Development: Case Studies from Ghana.** *Development, Journal of the Society for International Development* (2-3): 84-87.

Women's traditional roles in Ghana have been undermined due to diminishing natural resources. This paper argues the importance of including women in the design phase of projects aimed at promoting education, modern and appropriate technology, and sustainable development. The achievements of three multipurpose women's groups are reviewed. A farm project for women in war-ravaged Nakpayili was expanded to include primary health care and food processing programs. In Achubunyu village, an Oxfam loan to a group of women farmers resulted in high profits which were reinvested in the village economy and helped fund new wells for clean drinking water. The third case study involves the installation and training of village women in the use of a sheanut grinding machine in Buglung. While still in the implementation phase, the project is intended to increase yield, decrease waste, and improve the quality of life for women who previously were required to walk 10 km to the nearest facilities.

102. Pierce, Thomas H. October 1988. **Watershed Management in Haiti: The STAB Experience.** *Development Strategies for Fragile Lands (DESFIL).* Prepared for United States Agency for International Development, Washington, D.C. 35 pp.

This case study summarizes two years of experience in setting up and operating the Technical Secretariat for Watershed Management (STAB), funded by USAID, in Haiti. The program was designed to develop and implement a co-ordinated national watershed and natural resource program whose main objective was to reverse soil erosion. STAB was responsible for overall strategy development, policy analysis, information collection and dissemination, training, research, and the planning, design and evaluation of individual projects. This document reviews both the technological and institutional factors involved and highlights major accomplishments and lessons learned. Points of interest are the idea of a secretariat, the project information data base, program versus project management, and the establishment of independent channels of communication.

103. Poffenberger, Mark, ed. 1990. **Keepers of the Forest: Land Management Alternatives in Southeast Asia**. Kumarian Press, West Hartford, Connecticut, USA.

In response to failing custodial and production management systems during the last twenty years, small groups of foresters, scientists, and community development specialists in Southeast Asia began developing methods to empower forest families and villages with the rights to manage public lands. Such work has been supported by the Ford Foundation, and the results and experience have been collected in this book. Main sections are historical perspectives, tools and techniques for participatory management, and empowering communities through social forestry. Stories come from Indonesia, the Philippines, and Thailand.

104. Pradervand, Pierre. 1989. **Listening to Africa: Developing Africa from the Grassroots**. Praeger, New York.

The author argues that cultural, social and spiritual dimensions deserve as much, or more, attention as material considerations in any de-

velopment effort. Development is defined as "a process intended to enlarge and support the confidence, capacity and the creativity of human beings and thus to enrich their lives and improve their futures." The central focus of the book is realizing the effectiveness of peasant movements, and numerous success stories are illustrated throughout. Case studies are based on visits by the author to five countries: Burkina Faso, Kenya, Mali, Senegal, and Zimbabwe.

105. Prosterman, Roy L., et al. 1990. **Agrarian Reform and Grassroots Development: Ten Case Studies**. Lynne Rienner, Boulder, Colorado, USA.

This study by the Curry Foundation of U.S. policies toward agricultural development focuses on development aid "success stories." The common subject of the ten case studies is the relationship of the producer to the land. The study highlights the importance of land tenure issues in each of the countries, underlining the multifarious elements and issues involved. The goal of this research is to contribute to a greater understanding of land reform, landlessness and land tenure issues in order to further effective solutions.

106. Reid, Walter V. 1989. **Sustainable Development: Lessons from Success**. *Environment* 31(4):7-9, 28-35.

Reid first discusses the failures of large-scale western approaches, usually backed by multilateral development banks, bilateral aid agencies, and national governments. He goes on to attest that there can be viable solutions to environmental problems, as demonstrated by a number of projects, many of them grassroots efforts. The examples cited in this article are drawn largely from an earlier compilation entitled *Bankrolling Successes* (Reid, et al., Washington, D.C., 1988). Some specific and general strategies that have led to successful development projects are discussed. General strategies include maximizing efficiency in the use of natural resources, using appropriate

technologies, preserving options for the future by maintaining biodiversity, changing incentive structures, encouraging public participation, flexible implementation schemes, and dissemination of technology throughout communities.

107. Reid, Walter V., James N. Barnes, and Brent Blackwelder. 1988. **Bankrolling Successes: a Portfolio of Sustainable Development Projects.** Environmental Policy Institute/National Wildlife Federation, Washington, D.C. 48 pp.

In their campaign to increase multilateral development banks' commitment to environmentally sensitive lending practices, conservation organizations have often earned the reputation for being excessively negative. This booklet responds by providing positive examples and creative ideas for development that are both field-tested and supported by environmentalists. Twenty one-page summaries of successful projects from around the developing world comprise half the publication. A bibliography of primary information sources is provided.

The accompanying text describes general components of successful projects such as methods that raise productivity, increase efficiency, encourage public participation, and provide effective extension. Featured programs are:

- Majjia Valley windbreaks, Niger
- Sukhomajri watershed restoration, India
- Plan Sierra, rural development project, Dominican Republic
- Cassava Integrated Pest Management, Africa
- The Kuna Biosphere, Comarca, Panama
- Sian Ka'an Biosphere Reserve, Mexico
- Brazil's extractive reserves
- Guanacaste National Park, Costa Rica
- The Kenyan Jiko Charcoal Stove
- Rural development in the Ladakh desert, India
- Guinope rural development, Honduras
- The WWF Wildland and Human Needs Program
- Central Visayas Regional Project, Philippines
- Family Planning in Zimbabwe
- Fish Culture in Zaire
- Agroforestry Outreach in Haiti

- Java Social Forestry Program, Indonesia
- The Central Selva Area Development Project, Peru
- Small-scale organic farming in Chile

108. Reij, Chris. 1993. **Improving Indigenous Soil and Water Conservation Techniques: Does It Work?** *Indigenous Knowledge and Development Monitor* 1(1):11-13.

In the last few years, many experts have come to believe that soil and water conservation projects in Africa have largely failed. In response, the UN International Fund for Agricultural Development (IFAD) has been exploring new approaches by designing programs that begin with indigenous techniques. This article summarizes results from the IFAD's program in Niger, giving a case study of improving traditional planting pits in the Ader Douchi Maggia. The digging of planting pits (*tassa*) is a traditional method of land rehabilitation. The IFAD program shows farmers how to improve these *tassa* by increasing their size, by putting excavated earth downslope to allow runoff water to concentrate in the pits, and by applying manure. Between 1989 and 1992 farmers had treated some 700 hectares with *tassa*. This activity has been a catalyst for development in the Illela district.

109. Rodda, Annabel. 1991. **Women and the Environment.** Women and World Development Series, the Joint UN-NGO Group on Women and Development. Zed Books, London.

Rodda begins by presenting salient environmental issues, information on women's roles as users, producers, and managers, and the link between environmental degradation and women's lives. Later chapters highlight positive action taken by women despite limiting constraints. Essays include Wanjiru Kamau's "The Work of the Green Belt Movement," Jenny Pryke's "Women Take the Lead in Rural Development Projects," and an IFAD report on "The Production Credit for Rural Women in Nepal." The book also presents case studies intended to provide information and serve as models. The cases relevant to project imple-

mentation are:

■ Melissa Leach, "Women's Use of Forest Resources in Sierra Leone"

■ PROWESS/UNDP, "People, Pumps and Agencies: The South Coast Handpump Project"

■ IUCN-The World Conservation Union, "The Guarari Community Development Project"

■ International Labour Office, "The Samitis of Bankura"

■ Corinne Wacker, "Participatory Development Planning for Sustainable Development with Women's Groups in Kenya"

■ Mary Hopley, "Gender, Class and Use of Forest Resources"

110. Sarin, Madhu. 1993. **Wasteland Development and the Empowerment of Women: The SARTHI Experience**. SEEDS no. 16. The Population Council, Washington, D.C.

Under the traditional gender division of labor in India, the gathering of biomass (firewood, fodder, medicinal roots) is women's work. This issue of SEEDS describes an innovative approach to rehabilitating lands developed by SARTHI (Social Action for Rural and Tribal Inhabitants, a non-governmental organization based in western India). By assisting rural women to organize themselves around the patches of degraded common land, SARTHI has been able to help them meet their needs for biomass in a more efficient and ecologically sound manner and to empower them to assert themselves in dealing with a broader set of problems.

111. Sayer, Jeffrey. 1991. **Rainforest Buffer Zones: Guidelines for Protected Area Management**. Forest Conservation Programme, IUCN-The World Conservation Union, Gland, Switzerland. 94 pp.

In conservation terminology, a buffer zone is an area of restricted resource use or development peripheral to a national park or similar reserve. This document contains a series of short discussions and associated case studies for various topics related to buffer zones in tropical closed broad-leaved forests. Topics covered include: legal and institutional consid-

erations; rural development, including tree crops and agroforestry; forest peoples and forest management; non-wood forest products; and research, education, and tourism. Thirty-four short case studies from Africa, Latin America, Southeast Asia, and China are included.

112. J. Schelhas. 1991. **A Methodology for Assessment of External Issues Facing National Parks, with an Application in Costa Rica**. *Environmental Conservation* 18(4):323-330.

Effective implementation of conservation and development strategies depends on accurate assessment of the situation on the ground. Land use issues and the concerns of local people in and around national parks can be assessed systematically using a multidisciplinary, rapid-appraisal technique that was originally developed for farming systems research. Application of the methodology to the Braulio Carrillo National Park in Costa Rica supports the author's conclusion that a relatively short period of fieldwork (6-10 days) is sufficient for acquiring an accurate overview of a park's external situation. Appraisal techniques are designed to summarize key biological conservation issues related to the park and adjacent land; describe the most important aspects of the relationship between the national park and local people; and describe the most important existing patterns of landuse and natural resource use adjacent to the park.

113. Schmidheiny, Stephan, with the Business Council for Sustainable Development. 1992. **Changing Course: A Global Business Perspective on Development and the Environment**. MIT Press, Cambridge, Massachusetts, USA. 374 pp.

This contribution to the 1992 United Nations Conference on Environment and Development (UNCED) aims to dispel the myth that industry and the environment are incompatible. Analyses and case studies show how companies and governments can make ecological imperatives a part of the market forces that govern

production, investment, and trade. Stephan Schmidheiny is a Swiss industrialist, Chairman of the Business Council for Sustainable Development, and was the Principal Advisor for Business and Industry to the UNCED. Analytical chapters explore aspects of the business-environment relationship, e.g., pricing, energy, capital markets, trade, management and leadership, innovation, technology, and renewable resources. The book's second half consists of 38 case studies of businesses that exemplify the movement toward eco-efficiency. Multinationals such as Dow Chemical and Proctor and Gamble are featured, as are smaller, locally-based companies, such as a sugar producer in Zimbabwe which has begun to convert surplus biomass into energy and animal feed.

114. Scurlock, Jonathon, Alastair Rosen-schein, and David O. Hall. 1991. **Fuelling the Future: Power Alcohol in Zimbabwe**. African Centre for Technical Studies (ACTS)/Biomass Users Network. Acts Press, Nairobi, Kenya.

The ethanol plant at Triangle in southeast Zimbabwe is an example of a locally planned, locally controlled biomass-to-energy system. The authors qualify the project as a success based on the following features: (1) skills transfer and adaptation to a still-developing technological skill base; (2) recognition of the importance of energy independence for developing countries; (3) spanning of a political party transition (bearing in mind that many projects fail when governments change); (4) good integration with existing agricultural practice; (5) minimal perturbation of the environment. Main topics in the case study include operating experience, integration of plant and management, human resource development, future plans, and analysis of options to improve energy efficiency and bagasse use.

115. Sattaur, Omar. 1987. **Trees for the People**. *New Scientist* 115(1577):58-62.

Currently there are not enough trained Nepali foresters, rangers, and forest guards to manage existing forests and oversee new plantations.

The author sees community forestry and the local management that entails as key in guaranteeing survival of the forests. The history of community forestry in Nepal since 1977 is reviewed, as is current experience with the Integrated Hill Development Project, which seeks to remedy problems encountered in earlier efforts.

116. Savenije, H., and A. Huijsman, eds. 1991. **Making Haste Slowly: Strengthening Local Environmental Management in Agricultural Development**. Royal Tropical Institute, Amsterdam. 239 pp.

This book is the product of a workshop on "Environmental Management in Agricultural Development" organized by the Netherlands' Royal Tropical Institute. The focus is on small-scale agriculture in marginal areas, with the premise that sustainable land use critically depends on the way management of natural resources is organized, shaped, and institutionalized at the local level. Six chapter-long case studies illustrate an underlying message that incorporating local information into policy, planning and implementation is a prerequisite for long-term success. In Burkina Faso, the LUCODEB program aimed to halt desertification through stabling animals, shrub-planting, and soil and conservation measures. Southern Mali is the site of an erosion-control and land management project. Two different approaches to irrigation projects are demonstrated by the Kenyan case study. Community forestry projects in Peru and Indonesia are evaluated, as is an integrated development program in Sri Lanka.

117. Shaikh, Asif, and others. October 1988. **Opportunities for Sustained Development: Successful Natural Resource Management in the Sahel**. 4 vols. Office of Technical Resources, Sahel Office, Bureau for Africa. United States Agency for International Development, Washington, D.C.

This report focuses on a host of on-farm agricultural production practices that show

promise for sustainable agricultural growth in the four Sahelian countries studied (the Gambia, Mali, Niger, and Senegal). Report recommendations include designing site-specific conservation areas as integrated parts of a much wider landscape and linking fragmented habitat zones while buffering each area. Volume 1 contains the main report; volume 2 provides an in-depth description and analysis of each of the seventy initiatives studies. The Financial Analysis Annex (volume 3) provides a menu of potential interventions and a cost and benefit analysis. The Biological Diversity Annex (volume 4) reports on how interventions affected biological diversity of an area and the potential for integrating biodiversity concerns into future programs.

118. Sharma, P. N. 1992. **Community Participation for Forest Watershed Management in Laos.** *Journal of Soil and Water Conservation* 47(6):499-504.

During recent decades, land degradation and destruction of forest cover has progressed rapidly in Laos. To reverse this trend, the main phase of an FAO/UNDP project on forest development and watershed management was launched in late 1985 to train, demonstrate, and assist in implementation of various watershed management and community forestry techniques for upland conservation. The objective of this paper is to show that with support from the government and the local community, suitable watershed management could be achieved by large-scale training of various levels of personnel under the guidance of extension officers. Full participation of the rural people in planning and demonstrations resulted in development of more than 1930 hectares of upland conservation works during 1985-1989.

119. Shingi, Prakash M., ed. 1990. **Studies on Social Forestry in India.** Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Pacific, Bangkok, Thailand. 240 pp.

Made up of eighteen papers, this collection takes a variety of approaches in its analysis of social forestry in India. Contents include a literature review, trend analyses, case studies, field inquiries, and discussions of empirical databases, modelling, strategy formulation, and ideology. Papers are grouped into the following subject areas: issues relating to project formulation, management, and impact; special issues; and concerns relating to social forestry as a peoples' program.

120. Southgate, Douglas D., and John F. Disinger, eds. 1987. **Sustainable Resource Development in the Third World.** Westview Press, Boulder, Colorado, USA. 177 pp.

This collection of papers covers renewable resource management in the context of watershed management. It is argued that development efforts' success depends on support for integrated evaluation of the technical, social, and organizational dimensions of problems as well as on clear communication and flexibility. General papers address social forestry, soil erosion, reforestation, renewable energy projects, economic analysis of renewable resource conservation and biodiversity, and the social dimensions of natural resource management. There are case studies of conservation project planning and implementation and environmental management education in the Dominican Republic and Barbados, implementing the World Conservation Strategy in Central America and Colombia, and projects involving charcoal stoves in Kenya.

121. Stiles, Daniel. 1990. **Lakes of Grass: Regenerating Bourgou in the Inner Delta of the Niger River.** Sudano-Sahelian Office (UNSO), United Nations Development Programme Technical Publications Series, vol. 2. UNDP, New York. 15 pp.

In 1982 the United Nations Sudano-Sahelian Office (UNSO) began a project Mali under the government's Agro-Sylvo-Pastoral Integrated Development program to help regenerate and manage Severa Bourgoutieres in the Niafun



Ke-Goundam-Dire triangle. The project also aimed to improve the health of cattle through the provision of veterinary inputs, to rehabilitate selected areas by reforestation, and to introduce improved small-scale farming practices. This publication describes the historical setting, objectives, methods, results and impact of the project. The UNESCO project has accomplished many of its objectives and has become a catalyst for similar projects by national, bilateral, and non-governmental bodies in the inner delta region.

122. Stone, Roger D. 1991. **Wildlands and Human Needs: Reports from the Field**. World Wildlife Fund/Conservation Foundation, Washington, D.C.

Stone focuses on ecological decline and human poverty in some of the world's poorest communities. The World Wildlife Fund advocates solving these problems through increasing local people's knowledge, self-reliance, and quality of life. Working in this vein, the organization initiated the Wildlands and Human Needs Program, one of the most comprehensive efforts yet by a conservation group to unite community development with resource conservation. Roger Stone visited seven of the projects under the program, noting linkages between environmental deterioration and poverty and between traditional and people-centered approaches to conservation and development. Local institutions are the primary means of implementation for a majority of the projects.

123. Stone, Roger D. 1992. **The Nature of Development: A Report from the Rural Tropics on the Quest for Sustainable Economic Growth**. Knopf, New York. 286 pp.

Stone assesses the effectiveness of economic development plans in improving the quality of people's lives. The author visited and reports on representative villages in the rural tropics of Latin America, Asia, and Africa. The focus is on recounting examples and extracting lessons that can aid conservation groups, economic development agencies, and governments

in developing and industrialized countries in working together to improve human life and conserve biological diversity and natural habitats. The first chapter provides examples of "good" and "bad" sustainable rural development for the sake of comparison. Three chapters are devoted to consideration of selected villages. Conclusions include a review of some of the arguments put forward in the 1980 Brandt Commission Report, *North-South: A Program for Survival*.

124. Tangle, Laura. 1993. **Marketing Biodiversity Products: The Tagua Initiative**. Lessons from the Field Series, no. 2. Conservation International, Washington, D.C. 32 pp.

The Tagua Initiative links rural harvesters of the ivory-like nut of the tagua palm - which grows in South American rain forests - with makers of buttons, jewelry, and arts and crafts. The initiative is a project of Seed Ventures, a Conservation International program that creates incentives for conservation by developing international markets for products such as tree oils, plant fibers, fruits, nuts, and latexes. After three years, Conservation International and its local partners, CIDESA and Fundacion Inguede, have found that both in marketing and community development the project shows many signs of success. This publication documents both positive and negative experiences with the project thus far.

125. Thomas-Slayter, Barbara, Charity Kabutha and Richard Ford. 1991. **Traditional Village Institutions in Environmental Management: Erosion Control in Katheka, Kenya**. World Resources Institute, Washington, D.C. and African Centre for Technology Studies, Nairobi. 34 pp.

The authors assess almost twenty years of construction of bench terraces and check dams intended to control erosion and stabilize productivity in the Katheka Sublocation, Machakos District, Kenya. Fifteen traditional Mwethya groups have been revitalized, and they have constructed over 20 kilometers of

terraces and nearly one hundred check dams. Three reasons for these local soil management successes are given: the initiative was born of the need to meet local needs in the absence of any foreseeable external assistance; the bench terracing technique depends primarily on local resources and is well-known for its effectiveness; and the effort is housed within revitalized village-based institutions, thus functioning within an acceptable social context. Specific recommendations for the government of Kenya and the development assistance community are presented.

126. Thompson, John. February 1991. **Combining Local Knowledge and Expert Assistance in Natural Resource Management: Small-scale Irrigation in Kenya.** World Resources Institute, Washington, D.C. and African Centre for Technology Studies, Nairobi. 34 pp.

The communities of Njoguini, Gitero, and Kabati were founded in the early 1970s by cooperatives of landless peasant farmers from different regions and ethnic backgrounds of Kenya. A decade later each community formed a self-help organization to address the common problem of water shortage. By the late 1980s they had joined forces to design a common gravity-fed water supply and irrigation system, attract external support, and construct the system. The communities' success can be attributed in part to the fact that the cooperatives provided farmers with land titles and legal access to productive resources. The farmers framed their actions in response to increased risks associated with rainfed agriculture on semiarid lands and took advantage of the self-help groups' effective organization of water users. External agencies provided necessary financial and technical assistance without impinging on local institutional autonomy. Policy and program recommendations based on this experience are also provided.

127. Timberlake, Lloyd. 1987. **Only One Earth: Living for the Future.** BBC Books/Earthscan Publications, London. 168 pp.

Based on the television series of the same name, this book presents a series of profusely illustrated case studies of development seen through the eyes of the people making it happen. The case studies are of forests in Panama, regional development in Sri Lanka, pastoralism in Kenya, fisheries in the Solomon Islands, shantytown improvement projects in Peru, rural development in China, British organic farming, water management in California, and family planning in Zimbabwe.

128. Timberlake, Lloyd, ed. 1987. **Towards Sustainable Development: Fourteen Case-Study Reports.** Prepared for the Nordic Conference on Environment and Development, Panos Institute, London.

Most evaluations of development projects are written by foreign "experts." These fourteen reports, commissioned for the 1987 Nordic Conference on Environment and Development, were prepared by independent Asian and African journalists. The Nordic governments selected the projects to be reported on; authors were selected by the Panos Institute. Donor agencies comments are included, and there is an introductory chapter by Swedish prime minister Ingvar Carlsson.

129. Trzyna, Thaddeus C., and Ilze M. Gotelli. 1990. **The Power of Convening: Collaborative Policy Forums for Sustainable Development.** California Institute of Public Affairs, Claremont [Sacramento], California, USA. 112 pp.

These are the proceedings of a workshop, sponsored by IUCN, the Institute, and the Claremont Graduate School, that examined non-adversarial "collaborative policy forums" or "facilitated policy dialogues" as a tool for sustainable development. The book includes case studies of Sweden's Dag Hammarskjold Foundation, the Kativik Environmental Quality Commission in northern Canada, and traditional policy forums in Sri Lanka.

130. Tukahirwa, Eldad and Peter G. Veit. 1992. **Public Policy and Legislation in Envi-**

**ronmental Management: Terracing in Nyarurembo, Uganda.** World Resources Institute, Washington, D.C.

This report presents the findings and policy implications of a case study in effective community-based initiatives in resource management and socio-economic development. It is intended for government policy makers and members of the development assistance community concerned with sustainable grassroots development. An international research team collected demographic, socio-economic and environmental data in the study area, focusing on the efforts to protect soil and stabilize agricultural productivity through terracing activities over the last fifty years.

131. Tull, Kenneth. 1987. **Experiences in Success: Case Studies in Growing Enough Food through Regenerative Agriculture.** Rodale, Emmaus, Pennsylvania, USA. 52 pp.

Regenerative agriculture is the practice of improving the resource base of a farm while improving productivity through increased use of abundant and renewable internal resources and while reducing external inputs. This book presents five case studies: agroforestry in Nepal, hillside soil conservation on farms in Ecuador, bio-intensive gardening in the Philippines, integrated soil regeneration in Rwanda and small-plot organic farming in Chile.

132. United Nations Environment Programme. INFOTERRA. 1990. **Coastal Management, Desert Afforestation, and Ecological Farming: Striving for Sustainable Development.** INFOTERRA Exchange of Environmental Experience Series, vol. 3. UNEP, Nairobi.

The INFOTERRA Program has been mandated by UNEP to exchange experience on environmental issues. This volume provides examples of environmentally sound management of coastal areas, afforestation in arid and desert regions, a farming system that is ecologically sound, and decision-support informa-

tion system that is designed to be issue-oriented.

133. United Nations. Food and Agriculture Organization. 1985. **The Keita Integrated Rural Development Project.** Food and Agriculture Organization, Statistics Division, Rome.

The Keita integrated development project in Niger illustrates the dramatic achievements that can result when human energy and innovation are applied to the challenges of rural development. The publication gives a brief overview of the central components of the FAO project including land and water conservation, community participation, infrastructure development, crop production, women's work relating to nutrition and childcare, appropriate technology, educational programs, and animal production.

134. United Nations. Food and Agriculture Organization. 1985. **Tropical Forests: A Call for Action: Volume 2, Case Studies.** World Resources Institute, Washington, D.C.

This report by an international task force convened by the World Resources Institute, the World Bank, and UNDP is an effort to raise political awareness of the action needed to combat tropical deforestation. The FAO's Tropical Forest Action Programme provided the framework for this effort and identified five priority areas for action: fuelwood, forestry's role in land use, forest industrial development, conservation of tropical forest ecosystems and institution strengthening and research training. This report provides examples of successful projects, illustrating a range of solutions and prioritizing areas for investment and action. The task force concentrates on translating known solutions and strategies into a five-year program that would lay the groundwork for longer term investment. Five-year investment profiles are developed for a fifty-six country program.

135. Uphoff, Norman. 1986. **Local Institu-**

**tional Development: An Analytical Sourcebook with Cases.** Prepared for the Rural Development Committee, Cornell University. Kumarian Press, West Hartford, Connecticut, USA. 421 pp.

Uphoff consolidates the efforts of a working group on Local Institutional Development sponsored by the Rural Development Committee in the Center for International Studies, Cornell University. The first part is analytical and integrative, addressing local institutional development from the standpoints of natural resource management, rural infrastructure, primary health care, agriculture, and nonagricultural enterprise. The case studies which formed the basis for the analysis appear in a 100-page annex on local institutional development experience. Cases come from all parts of the developing world and are grouped under the same sectoral and general headings as found in the first part of the book.

136. Veit, Peter G., Adolfo Mascarenhas, and Okyeame Ampadu-Agyei. 1993. **Local-Level Natural Resource Management: Lessons Learned from the Ground Up.** Center for International Development and Environment. World Resources Institute, Washington, D.C.

There is ample evidence that sub-Saharan Africa's natural resource base is deteriorating. While the causes of this degradation are many and well-known, appropriate policy responses are less clear-cut. This report makes the case for policies and programs that promote local-level natural resource management. Synthesizing the findings of the From the Ground Up Case Study Series and other analyses of community resource management, the authors identify key determinants to successful local self-help initiatives. They recommend policy options for African governments and the development assistance community for fostering sustainable development at the local level.

137. Vietmeyer, Noel. 1988. **Animal Farming Saves Forests.** *American Forests* 94(11-12):46-8.

The farming of tropical forest wildlife has proven to be a profitable venture for small farmers while, at the same time, preserving tropical forests and endangered species. In Papua New Guinea, butterflies and crocodiles are a growing small venture that utilizes the natural forest. Two reports on these industries have been published by the U.S. National Academy of Sciences. In Panama, the Smithsonian Institute has been active in setting up iguana and paca farming. Numerous other species native to tropical forests are now being farmed on a small scale and there is considerable potential in the farming of forest animals yet to be investigated.

138. Wali, Alaka. 1990. **Living with the Land: Ethnicity and Development in Chile.** *Grassroots Development*. 14(2):12-20.

Wali argues that ethnicity is the social foundation for lasting development. This claim is based on the author's fieldwork among the Aymara and Mapuche Indians in the hills of southern Chile. Development efforts of the past have erred because they visualized local cultures as obstacles to overcome rather than as opportunities to capitalize upon. The two groups discussed, both living in the Andes, exemplify how tapping local systems of knowledge can result in effective resource management. The Aymara and Mapuche peoples are quite different from one another and, as a result, very different sorts of grassroots programs were administered. Nonetheless, three common factors for success could be identified: reinforcing group identity, enhancing self-esteem, and empowering project participants.

139. Walker, Brian W. 1985. **Authentic Development in Africa.** *Headline Series*, vol. 274. Foreign Policy Association, New York. 70 pp. This study of the current crisis in Africa stresses that long-term solutions must be found by Africans themselves. Outside funds and assistance must only be used to build upon authentic African cultures and institutions, focusing on traditional technologies and

the central role played by women and the small farm sector, while shifting support from short- to long-term strategies. Walker provides examples of "people-focused" approaches that have proved successful in alleviating poverty, including a water harvesting and agroforestry project funded by Oxfam in Burkina Faso, an American Friends Service Committee development project in Guinea-Bissau, and a family planning project initiated by USAID in Zimbabwe.

140. Wells, Michael and Katrina Brandon. 1992. **People and Parks: Linking Protected Area Management with Local Communities.** World Bank/World Wildlife Fund/United States Agency for International Development, Washington, D.C. 99 pp.

The report presents a set of initiatives for mitigating the growing crisis found in protected areas around the world. The initiatives are based on integrated conservation and development projects (ICDPs), which aim to reconcile the management of protected areas with the meeting of local people's social and economic needs. The authors examine recent experiences of twenty-three projects funded by the World Bank, WWF, and USAID in Africa, Asia, and Latin America. They explore social, ecological, technical, and institutional issues encountered in the case studies. The report assesses effectiveness of field operations, identifies vital elements in the design of ICDPs, and elaborates on lessons for future programs.

141. Western, S. 1988. **Carrying Capacity, Population Growth and Sustainable Development: A Case Study from the Philippines.** *Journal of Environmental Management* 27(4): 347-67.

This case study, funded by the European Community, investigated environmental degradation, population growth, and land tenure problems on the island of Palawan. The island was divided into six ecological zones and twenty subzones to allow identification of areas where rural carrying capacity was being

exceeded enough to threaten sustainable development. Three overall strategies - Extended Development, Optimum Development, and Maximum Conservation - were compared to an extrapolation of current trends. Of those options, Optimum Development was found to be most useful in meeting local needs, in redirecting population and agriculture away from higher slopes, and in achieving sustainable development.

142. Whelan, T., ed. 1991. **Nature Tourism: Managing for the Environment.** Island Press, Washington, DC. 223 pp.

The premise of nature tourism is that it provides a mechanism for linking the promotion of natural resource conservation with local economic development. When properly managed, nature tourism represents one form of ecologically-sustainable development. The first part of this book describes visits to key nature tourism destinations, reporting on both success stories and failures. A variety of programs currently operating is covered. Case studies are taken from Kenya, Costa Rica, and the western portion of the United States. The latter half of the book sets forth practical guidelines for developing a successful nature tourism scheme. Topics include conducting cost-benefit analysis of potential sites, planning local participation in projects, and relating the concept of sustainability to tourism development.

143. Wilken, Gene C. 1977. **Integrating Forest and Small-Scale Farm Systems in Middle America.** *Forest Ecology and Management* 1(3):23-34.

This study of forest and forest/field ecosystem dynamics in Mexico and Guatemala belies the common assumption that forest and farm are incompatible, for there are some crop plants that grow better in species-diverse, structurally complex communities. Some small-scale farmers in Central America partially recreate forest conditions in their fields to improve edaphic and microclimate conditions. Farmers

may either physically transfer forest products or simulate forest structures and nutrient cycles in cultivated fields. Examples of these approaches and their benefits are provided.

144. Winterbottom, Robert, and P. T. Hazlewood. 1987. **Agroforestry and Sustainable Development: Making the Connection**. *Ambio* 16(2):100-10.

Different forms of agroforestry are described. Agroforestry's potential contributions to sustainable rural development include controlling deforestation, increasing productivity, meeting the needs of low-resource farmers, and generating employment and income. The authors conclude that this set of benefits can only be realized if local communities are fully involved in development and implementation. Case studies of successful agroforestry projects are from Burkina Faso, Haiti, and Nepal.

145. Wood, Geoffrey D., and Richard Palmer-Jones. 1990. **The Water Sellers: A Co-operative Venture by the Rural Poor**. Kumarian Press, West Hartford, Connecticut, USA.

Waterselling by the landless is a concept that aims to empower the poor through facilitating their access to a crucial rural resource. Thus it is not merely an income-generating activity but also an attempt at agrarian reform. This book presents the experience of an experimental program in which over 150 small groups of landless water sellers worked in association with Proshika, a Bangladeshi non-governmental organization, to establish an irrigation service.

146. Wright, R. Michael. 1980. **Resolving Conflicts in Natural Resource Priorities: Some Experiences from Developing Countries**. In: *Forty-Fifth North America Wildlife and Natural Resources Conference*.

Establishing a protected area may exacerbate, rather than reduce, conflicts over the use of natural resources. This document reviews experience with resolving conflicts associated

with protected areas in Costa Rica, Dominica, Grenada, and Panama. Observations on conflict resolution come under the following headings: the conservationist as mediator, the power of the environment, conflict settlement or conflict avoidance, and the benefits of conservation.

# List of Acronyms

- AES, Applied Energy Service**  
**CARE, Cooperative for American Relief Everywhere**  
**CEMP, Centre for Environmental Management and Planning**  
**CIAT, Centro Internacional de Agricultura Tropical**  
**DESFIL, Development Strategies for Fragile Lands (USAID)**  
**ERIC-CSMEE, Educational Resources Information Center - Clearinghouse  
for Science, Mathematics, and Environmental Education**  
**FAO, Food and Agriculture Organization of the United Nations**  
**FINNIDA, Finnish International Development Agency**  
**GIS, geographic information system**  
**IAF, Inter-American Foundation**  
**ICLEI, International Council for Local Environmental Initiatives**  
**ICRAF, International Council for Research in Agroforestry**  
**ICRISAT, International Crops Research Institute for the Semi-Arid Trop-  
ics**  
**IDRC, International Development Research Centre**  
**IFAD, International Fund for Agricultural Development (UN)**  
**IIED, International Institute for Environment and Development**  
**ILEIA, Information Centre for Low-External-Input and Sustainable  
Agriculture**  
**ILO, International Labour Organisation (UN)**  
**INFOTERRA, International Register for Sources of Environmental Infor-  
mation (part of UNEP)**  
**IUCN, International Union for Conservation of Nature and Natural Re-  
sources**  
**MAB, Man and the Biosphere Programme (of Unesco)**  
**MIRCEN, Microbiological Resource Centre (under UNEP)**  
**NGO, non-governmental organization**  
**NORAD, Norwegian Agency for International Development**  
**NWF, National Wildlife Federation, USA**  
**SAREC, Swedish Agency for Research Cooperation with Developing  
Countries**  
**T, telephone**  
**UN, United Nations**  
**UNCED, United Nations Conference on Environment and Development**  
**UNDP, United Nations Development Programme**  
**UNEP, United Nations Environment Programme**  
**UNESCO, United Nations Educational, Scientific and Cultural Organiza-  
tion**  
**UNRISD, United Nations Research Institute for Social Development**  
**UNSO, United Nations Sudano-Sahelian Office (UNDP/UNEP)**  
**USAID, United States Agency for International Development**  
**WRI, World Resources Institute**  
**WWF, World Wild Fund for Nature (or World Wildlife Fund)**  
**WorldWIDE, Women in Development and Environment**

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*Forest Ecology and Management*, Elsevier Science Publishers B.V., P.O. Box 211, 1000 AE Amsterdam, Netherlands. T: (31 20) 5803911

*Forestry Chronicle*, Canadian Institute of Forestry, 1005-151 Slater Street, Ottawa, Ontario K1P 5H3, Canada. T: (1 613) 234-2242

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# Author Index

- Ade-Oduntola, K., 1  
African Development Foundation, 2  
Alam, Z., 31  
Alcorn, J. B., 94  
Alcott, M., 83  
Altieri, M. A., 3  
Ameyaw, S., 4  
Ampadu-Agyei, O., 35,36,136  
Anderson, A. B., 5  
Anderson, D., 6  
Arens, T., 31  
Arensberg, W., 7  
Arledge, J. E., 8  
Atthasampunna, P., 9  
Ayling, R. D., 10
- Bayling, N. S., 83  
Bannerjee, N. K., 11  
Banskota, M., 66  
Barnes, J. N., 107  
Barrett, H., 12  
Barzetti, V., 13  
Bass, S. M. J., 31  
Bendavid-Val, A., 14  
Bidwell, R., 31  
Biswas, A. K., 15  
Blackwelder, B., 107  
Borrini, G., 16  
Brandon, K. E., 17,140  
Browder, J. O., 18  
Brown, A., 12  
Bryant, J. J., 17  
Budathoki, K., 66  
Budowski, G., 20  
Bunch, R., 21,31  
Burniske, G. R., 88  
Burwell, B. B., 88  
Business Council for Sustainable Development, 113  
Butera, F. M., 22
- Carpenter, R. A., 23  
Carr, M., 24  
Center for International Development and Environment, 26  
Centre for Environmental Management and Planning, 25
- Centro Cooperativista Uruguayo, 31  
Chand, S. P., 66  
Chew, S. T., 27,28  
Clark University Program for International Development, 29  
Conroy, C., 31  
Conway, F. J., 31  
Conway, G. R., 31  
Cook, C. C., 30  
Cottingham, R., 31  
Cowan, M. E., 32  
Critchley, W., 33
- Dankelman, I., 34  
Davidson, J., 34  
Dichter, T. W., 31  
Disinger, J. F., 120  
Dorm-Adzobu, C., 35,36  
Dyasi, H. M., 37
- Erdelen, W., 63  
Erskine, J. M., 38  
Evan, H. Z., 39  
Evans, J., 31
- Fals-Borda, O., 40  
Field-Juma, A., 51  
van de Flert, E., 42  
Ford, R., 41,68,125  
Freeman, P. H., 43  
Fricke, T. B., 43
- Gao H. B., 66  
Garcia-Zamor, J., 44  
Gerden, C. A., 45  
Gettman, D., 31  
Ghai, D., 46  
Gibson, D. C., 47  
Gischler, C., 48  
Gomez-Pompa, A., 49  
Gotelli, I. M., 129  
Gradwohl, J., 50  
Greenberg, R., 50  
de Groot, P., 51  
Grut, M., 30  
Gupta, A., 52
- Hadley, M., 49  
Hall, D. O., 5,114  
Hanrahan, M., 53  
Hansen, M., 54  
Hanson, A., 31  
Harper, D. E., 23  
Harrison, P., 55,56  
Hartshorn, G. S., 57  
Hasan, A., 31  
Hazlewood, P. T., 144  
Heckadon, S., 13  
Heckman, J., 58  
Hislop, D., 31  
Hobley, M., 109  
Horberry, J., 31  
Hough, J. L., 59  
Hudson, N., 31,88  
Huijsman, A., 116  
Husain, T., 31,66  
Hyman, E. L., 60
- IUCN-The World Conservation Union, 109  
International Council for Local Environmental Initiatives (ICLEI), 61  
International Development Research Centre, 62  
International Fund for Agricultural Development, 31, 109  
International Labour Office, 109  
Ishwaran, N., 63
- Janzen, D., 70  
Jasanoff, S., 64  
Jauregui, C. F., 48  
Jeffers, J. N. R., 65  
Jere, H. E., 31  
Jodha, N. S., 66  
Jordan, W. R., 67  
Joshi, B. R., 66
- Kabutha, C., 68, 125  
Kabuye, C., 69  
Kamau, W., 109  
Katz, A., 70  
Kemf, E., 71

- Kerkhof, P., 72  
 Kleymeyer, C. D., 73  
 Kurien, J., 31  
 Kwapena, N., 74
- Lal, R., 75  
 Leach, G., 76  
 Leach, M., 109  
 Lee, K. N., 77  
 Lele, U., 78  
 Lelo, F., 41  
 Litvinoff, M., 31  
 Liu, Z. G., 66  
 Lombera, R., 31  
 Lowe, R. G., 79  
 Lucas, P. H. C., 80
- Martin-Brown, J., 81  
 Mascarenhas, A., 136  
 McCaffrey, D., 31  
 McNeely, Jeffrey A., 82  
 Mearns, R., 76  
 Mehra, R., 83  
 von Mehren, P., 31  
 Meier, P., 84  
 Mellors, D. R., 31  
 Mian, M. A., 31  
 Miller, E. U., 47  
 Mishra, H. R., 31  
 Mishra, P. R., 85  
 Moldenhauer, W. C., 86  
 Morrissey, S., 31  
 Mtallo, S., 45  
 Munasinghe, M., 84  
 Myhren, P., 31
- Nakarmi, G., 31  
 National Research Council,  
 Commission on Life Sci-  
 ences, 87  
 Nations, J. D., 88  
 Newmark, W. D., 89  
 Nijkamp, P., 90  
 Novikoff, G., 91
- Oakley, P., 92  
 Ofosu-Amaah, W., 81  
 Okafor, J. C., 93  
 Oldfield, M. L., 94  
 Opole, M., 31  
 Oram, P. A., 95  
 Ornes, H., 31  
 Overholt, C., 96
- PROWESS/UNDP, 109  
 Paaby, D., 97  
 Palm, O., 98  
 Palmer-Jones, R., 145  
 Panos Institute, 99  
 Partap, T., 66  
 Paskett, C. J., 100  
 Paul, A. F., 101  
 Philoctete, C. E., 100  
 Pierce, F. J., 75  
 Pierce, T. H., 102  
 Poffenberger, M., 103  
 Pound, B., 66  
 Pradervand, P., 104  
 Prosterman, R. L., 105  
 Pryke, J., 109
- Rahman, M. A., 40  
 Reid, W. V., 106,107  
 Reij, C., 31,108  
 Rodda, A., 109  
 Rosenschein, A., 114  
 Rovinski, Y., 13
- Sandell, K., 98  
 Sarin, M., 31,110  
 Sattaur, O., 115  
 Saunier, R., 31  
 Savenije, H., 116  
 Sayer, J., 111  
 Schelhas, J., 112  
 Schmidheiny, S., 113  
 Schmidt, O. G., 31  
 Scurlock, J., 114  
 Seo, J., 31  
 Shaikh, A., 117  
 Sharma, K. S., 66  
 Sharma, P. N., 118  
 Shingi, P. M., 119  
 Sinha, S., 31  
 Skouri, M., 91  
 Smillie, I., 31  
 Soeteman, F. J., 90  
 Southgate, D. D., 120  
 Stapp, W. B., 32  
 Stiles, D., 121  
 Stone, R. D., 122,123  
 Sumardja, E. A., 31  
 Swedish Agency for Research  
 Cooperation with Develop-  
 ing Countries, 62
- Tangle, L., 124  
 Thapa, B., 66
- Thomas-Slayter, B. P., 67,125  
 Thompson, J., 126  
 Timberlake, L., 127,128  
 Tosi, J. A., 31  
 Trzyna, T. C., 129  
 Tukahirwa, E., 130  
 Tull, K., 131
- United Nations Environment  
 Programme, INFOTERRA,  
 132  
 United Nations. Food and  
 Agriculture Organization,  
 133,134  
 Uphoff, N., 135
- Van den Bergh, C. J. M., 90  
 Veit, P. G., 35,36,130,136  
 Verma, L. R., 66  
 Vietmeyer, N., 137
- Wacker, C., 109  
 Wali, A., 138  
 Walker, B. W., 139  
 Wells, M., 17, 140  
 Western, S., 141  
 Whelan, T., 142  
 Whitmore, T. C., 49  
 Wilken, G. C., 143  
 Winarto, Y. T., 42  
 Wind, J., 31  
 Winterbottom, R., 144  
 Wood, G. D., 145  
 Wright, D., 31  
 Wright, R. M., 146  
 Wu, N., 66
- Ye, X. Q., 66

# Subject Index

*Note: This index covers only the main themes of case studies.*

- Agrarian reform, 105
- Agriculture, general, 3,21,43,66,69,95,98,116, 130
- Agroforestry, 2,10,30,36,38,47,56,72,88,93, 142,143
- Biological diversity, 82,94
- Business and industry, 24,113,124
- Cities, 14,39,61
- Community participation, 4,11,16,36,40,41,44, 46,59,73,83,92,104,115,119,122,132,135
- Cultural energy, 73
- Decision-making, 129
- Education, 19,32
- Energy, general, 14,22,25
  - Alcohol, 116
  - Cookstoves, 60
  - Fuelwood, 76,84
- Forestry 20,45,49,50,56,57,79,99,103,111,115, 119,133
  - Reforestation, 6,51,71
- Fisheries, 77
  - Aquaculture, 70
- Local institutions, 134
- Mining, 25
- Mountains, 66,86,89
- Participatory Action-Research, 40
- Participatory Rural Appraisal, 41,68
- Pastoralism, 65
- Pest control, 3,42,54
- Primary Environmental Care, 16
- Protected areas, 17,63,67,80,85,112,122,139, 145
- Research, 62,87
- Regional Sustainable Development, 90
- Strategies and country studies, 7,53
- Soil conservation, 8,33,75,86,88,91,100,102, 108,125,129
- Solid waste, 9
- Traditional knowledge, 37,43,69,74,108,125, 126,129,137
- Tourism, 97,141
- Upland management, 23,66
- Values, 35,104
- Water resources, 15,26,33,48,77,108,126,144
- Watershed management, 77,102,118
- Wildlife, 74,136
- Women, 1,11,12,34,81,83,96,101,109,110

# Geographic Index

## AFRICA

Africa, general, 10,34,44,54,55,56,76,107,111,136

Botswana, 4,24,31,90

Burkina Faso, 31,33,72,104,116,139,144

Cameroon, 50,72,78

Cape Verde, 58,86

Cote d'Ivoire, 49

Egypt, 15,44,52

Ethiopia, 31,72,78

The Gambia, 12,117

Ghana, 24,31,35,36,37,101

Guinea-Bissau, 139

Kenya, 22,24,29,30,31,33,41,51,60,65,68,69,72,86,89,104,107,109,116,120,125,126,127,142

Malawi, 59,78,86

Mali, 31,33,72,79,104,116,117,121

Namibia, 94

Niger, 31,72,107,108,117,133

Nigeria, 6,49,78,79,93

Rwanda, 27,30,47,72,131

Senegal, 22 43,72,104,117

Sierra Leone, 2,109

Sudan, 22 43,72,104,117

Swaziland, 24,31

Tanzania, 26,30,45,78,80,89,99

Tunisia, 91

Uganda, 50,130

Zaire, 107

Zambia, 31,72

Zimbabwe, 72,107,113,114,127,139

## AUSTRALIA AND OCEANIA

South Pacific Region, 19,54

Australia, 49,80

Micronesia, 22

New Zealand, 80

Papua New Guinea, 49,50,74,137

## EAST ASIA

Southeast Asia, 111

Bangladesh, 31,44,145

China, 50, 66,80,112,127

India, 11,22,24,31,34,49,52,64,66,107,110,119

Indonesia, 22,31,42,49,50,86,103,107

Japan, 80

Laos, 118

Malaysia, 49

Nepal, 22,24,28,31,66,70,80,85,99,109,115,131,144

Philippines, 14,22,23,44,50,54,83,103,107,131,142

Sri Lanka, 44,49,63,84,98,116,127,129

Taiwan, 23,86

Thailand, 9,14,23,31,50,52,103

Vietnam, 71

## EUROPE

Czech Republic, 94

France, 80

Greece, 90

Netherlands, 90

Poland, 80

Portugal, 14

Slovakia, 94

Sweden, 129

United Kingdom, 80, 127

## LATIN AMERICA AND THE CARIBBEAN

Latin America and the Caribbean, general, 34, 48,53,111

Amazon Basin, 5,52

Central America,120

South America, 124

Argentina, 22

Barbados, 120

Belize, 50

Bolivia, 20,31

Brazil, 5,18,49,50,107

Chile, 73,107,131,138

Colombia, 18,49,50,94,131

Costa Rica, 13,20,50,54,67,97,107,112,142,146

Cuba, 49

Dominica, 149

Dominican Republic, 31,86,107,120

Ecuador, 5,18,31,50,94,131

El Salvador, 13,52

French Guiana, 49

Grenada, 145

Guatemala, 8,13,22,88,143  
Haiti, 31,50,100,102,107,144  
Honduras, 13,21,31,86,107  
Jamaica, 52,86  
Martinique, 80  
Mexico, 5,18,31,49,50,94,107,143  
Nicaragua, 13,54  
Panama, 13,50,94,107,137,146  
Paraguay, 31  
Peru, 5,57,86,107,116,127  
Suriname, 20,49,50  
Uruguay, 31  
Venezuela, 49

#### **NORTH AMERICA**

Canada, 77,129  
United States of America, 77,80,127,141

#### **WEST ASIA**

Israel, 39  
Pakistan, 22,31,34,66  
Yemen, 44







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