

Eco Regional Approaches For Sustainable Land Use And Food Production 1st Edition

The first premise of this book is that farmers need access to options for improving their situation. In agricultural terms, these options might be management alternatives or different crops to grow, that can stabilize or increase household income, that reduce farm inputs, or that exploit local market opportunities. Farmers need a facilitating environment, in which affordable credit is available if needed, in which policies are conducive to judicious management of natural resources, and in which costs and prices of production are not so high that they impede the farmer's ability to invest in the land. The second premise is that the important role to play in fostering this understanding of options, traditional field experimentation being time-consuming and costly. This book summarizes the activities of the International Benchmark Sites Network for Agrotechnology Transfer (IBSNAT) project, funded by the United States Agency for International Development (USAID). IBSNAT was an attempt to demonstrate the effectiveness of understanding options through systems analysis and simulation for the ultimate benefit of farm households in the tropics. The project was first suggested at one of the last IBSNAT group meetings held at the University of Hawaii in 1993.

Today the goal of designing highly productive, sustainable agricultural production systems is at the forefront of agricultural research agendas around the world. The key to designing sustainable agricultural production technologies is in understanding their environmental and health impacts. This volume presents a methodology designed to quantify such impacts and to represent them as tradeoffs. This tradeoff methodology is proposed as an approach to accomplish two essential elements in achieving agricultural sustainability. The design of successful interdisciplinary research projects for assessing sustainability of production systems. Second, the tradeoffs method provides a successful means of communicating research findings to policy makers and the public. The use of crop-soil modelling has so far been mainly confined to the research community. Practical applications have occurred in the areas of decision tools for irrigation studies and pest management. However, there is potential to increase its applied use. Simulation modelling and assesses its application to agriculture in developing countries. It is based on work sponsored by the Natural Resources Systems Programme of the UK Department for International Development.

Crop-soil Simulation Models

Evaluation of Development Policies Using Integrated Bio-economic Land Use Models: Applications to Costa Rica

Understanding Options for Agricultural Production

Applications of Systems Approaches at the Field Level

Building on Consensus

General Technical Report NC.

Integrated studies on the assessment and improvement of soil and water quality have to deal almost inevitably with issues of scale, since the spatial support of measurements, the model calculations and the presentation of results usually vary. This book contains the selected and edited proceedings of a workshop devoted to issues of scale entitled: 'Soil and Water Quality at Different Scales', which was held in 1996 in Wageningen. It is intended for environmental researchers, scientists and MSc and PhD students. Part 1 covers current issues and methodologies with scale related soil and water quality research. Part 2 covers agroecological and hydrological case studies in which scale transforms form an important part of the research chain. Part 3 consists of papers focusing on methodologies and up and downscaling. Part 4 contains review papers based on modellers' and statisticians' considerations as well as the papers and posters presented during the workshop. Part 5 consists of short research notes.

This book assembles experiences acquired with sustainable forest and tree resource management partnerships in various Latin American countries. It addresses the question of which conditions are necessary for partnerships to stimulate sustainable, socially just and pro-poor governance of forest resources.

The need to increase food production, enhance economic growth and reduce poverty in an environmentally sustainable context is an issue of growing importance. This book addresses the linkages and tradeoffs involved in solving such key challenges.

Considerations for the Future

Bouman

From Eco-Cities to Sustainable City-Regions

Complexity Approach To Sustainability, A: Theory And Application (Second Edition)

Definitions and Terms

Proceedings of a symposium on eco-regional approaches in agricultural research, 12–16 December 1994, ISNAR, The Hague

ILRI 1995

This thesis explores the avenues for the ecosystem approach to management in the Baltic Sea Region. This region is one of the most contaminated water bodies in the world, although the first Regional Seas Convention was created here and thereon has a long history of cooperation and environmental protection. The current environmental governance arrangements are examined with specific focus on governance structures, cross-sectoral integration and ecological boundaries. The ecosystem approach to management as both a tool and vision of holistic management of natural resources is traced through the evolution of environmental governance, as well as its manifestation in contemporary environmental policies in the region. It is found that the major EU directives, as well as HELCOM policies, promote the ecosystem approach and that its presence has increased in recent years; it is now the major guiding principle in European marine governance. However, the governance structures impede implementation in different ways. The environmental problem areas in the region all require different governance arrangements, thus obstructing a holistic approach. The environmental problems per se also affect each other, necessitating far-reaching sectoral integration and cross-border cooperation, which at present is the major obstacle regarding implementation. The contemporary trends combining solid regionalisation through HELCOM with increased Europeanisation and macro regionalisation by different EU initiatives offer some promise, but the cross sectoral impediments must be resolved if the ecosystem approach is to become a practical approach and not just a policy principle.

Understand sustainable development from economic, ecological, and social perspectives As world population continues to increase, the need grows for a safe, sustainable supply of food.

Agricultural and Environmental Sustainability: Considerations for the Future provides the latest research results and vital information on the process of production.

In the coming decades the world will need to more than double its food and feed production, almost all of the increase being needed in developing countries. This has socioeconomic and biophysical implications. Traditional component and commodity research addresses overly narrow issues at too small a scale. Rural development needs an eco-regional approach that integrates biophysical and socioeconomic work on cropping systems, livestock, the environment, and natural resources. This book contains the papers, response papers and discussion report of a five-day seminar on eco-regional approaches. It assesses the state of the art of systems approaches applied to eco-regional problems, presenting and discussing a number of case studies. Future research needs are discussed, as well as ways to improve collaboration between research institutes. The seminar on which the book is based was organised on behalf of the Directorate General for International Cooperation of the Netherlands Ministry of Foreign Affairs by the Research Institute for Agrobiological and Soil Fertility (AB-DLO), the Wageningen Agricultural University (WAU), and the International Potato Centre (CIP). It was held at the International Service for National Agricultural Research (ISNAR), and was attended by participants from all CGIAR centres, among others.

Exchange of Methodologies in Land Use Planning

Evolving from farming systems research into a more holistic rural development approach: Experiences in the Andean region

Applications of Systems Approaches at the Farm and Regional Levels

Proceedings of the Second International Symposium on Systems Approaches for Agricultural Development, held at IRRI, Los Baños, Philippines, 6–8 December 1995

Ecoregion-Based Design for Sustainability

The Viability of Regional Conservation Strategies

Partnerships in Sustainable Forest Resource Management: Learning from Latin America

A political scientist and an urban architect explore China's odyssey to become an ecological civilization and transform its massive, unsustainable, urbanization process into one that creates hundreds of eco-cities. The resulting From Eco-Cities to Sustainable City-Regions is the first book-length study combining analysis of politics and power, urban design and planning issues derived from the co-authors' interdisciplinary research, and on-site fieldwork from their political science and architectural area specialties.

This book reflects the results of more than ten years of cooperative research involving Wageningen Agricultural University (y. l AU) in the Netherlands, the Tropical Agricultural Research and Higher Education Center (CATIE; Centro Agronómico Tropical de Investigación y Enseñanza) in Costa Rica and the Costa Rican Ministry of Agriculture and Livestock (MAG; Ministerio de Agricultura y Ganadería) as part of the Research Program on Sustainability in Agriculture (REPOSA) in the Central American country. The type of cooperation was unusual as it focused on both research and the education of students undertaking either M. Sc. thesis projects or a program of practical training in the various aspects of studying land use. Since funding was provided by W AU, a high degree of scientific autonomy was created that has clearly benefited the independent, scientific rigor of the work. Over the ten-year period, the program has changed from being a patchwork of various insulated specialist projects, into a truly interdisciplinary effort, leading to the development of innovative tools for analyzing land use on a number of geographical scales. These tools are presented in this book. Besides CATIE and MAG, cooperation with other Costa Rican partner institutions has been essential from the beginning, and this process of interaction has also evolved considerably over time.

Eco-regional approaches for sustainable land use and food productionProceedings of a symposium on eco-regional approaches in agricultural research, 12–16 December 1994, ISNAR, The HagueSpringer Science & Business Media Volume 2: Proceedings of the Second International Symposium on Systems Approaches for Agricultural Development, held at IRRI, Los Baños, Philippines, 6–8 December 1995

Sociology, Organic Farming, Climate Change and Soil Science

Tradeoffs Or Synergies?

Sustainable Agriculture

Advances in Agronomy

Building a Global Research Institute

Recent Advances in Quantitative Analysis for Developing Countries

The volume concludes with a brief outline of the most important challenges ahead.

Sustainable agriculture is a rapidly growing field aiming at producing food and energy in a sustainable way for humans and their children. Sustainable agriculture is a discipline that addresses current issues such as climate change, increasing food and fuel prices, poor-nation starvation, rich-nation obesity, water pollution, soil erosion, fertility loss, pest control, and biodiversity depletion. Novel, environmentally-friendly solutions are proposed based on integrated knowledge from sciences as diverse as agronomy, soil science, molecular biology, chemistry, toxicology, ecology, economy, and social sciences. Indeed, sustainable agriculture decipher mechanisms of processes that occur from the molecular level to the farming system to the global level at time scales ranging from seconds to centuries. For that, scientists use the system approach that involves studying components and interactions of a whole system to address scientific, economic and social issues. In that respect, sustainable agriculture is not a classical, narrow science. Instead of solving problems using the classical painkiller approach that treats only negative impacts, sustainable agriculture treats problem sources. Because most actual society issues are now intertwined, global, and fast-developing, sustainable agriculture will bring solutions to build a safer world. This book series gathers review articles that analyze current agricultural issues and knowledge, then propose alternative solutions. It will therefore help all scientists, decision-makers, professors, farmers and politicians who wish to build a safe agriculture, energy and food system for future generations.

Life Cycle Approaches to Sustainable Regional Development explains the ways life cycle methodologies and tools can be used to strengthen regional socio-economic planning and development in a more sustainable manner. The book advocates the adoption of systematic and long-term criteria for development decision-making, taking into account the full life cycle of materials and projects. It describes life cycle practices from both a scientific and a practitioner point of view, highlighting examples and case studies at regional level. The applications are relevant to key economic sectors, as well as for internal planning and administrative procedures. It concludes with a synthesis chapter that distills the key messages from the authors into practical guidance points on how best to use such approaches to enhance sustainability in regional development. The book is essential reading for regional and urban planners who are integrating life cycle thinking into their policy regimes, as well as for researchers working to further evolve life cycle methodologies.

Proceedings of the International Symposium SysNet'99: Systems Research for Optimizing Future Land Use Held at the International Rice Research Institute, Los Baños, Philippines, 11–13 October, 1999

Agricultural Intensification, Economic Development, and the Environment

Economic Policy and Sustainable Land Use

Seventh Symposium on Systems Analysis in Forest Resources, Traverse City, Michigan, USA, May 28–31, 1997

Life Cycle Approaches to Sustainable Regional Development

Applications in Developing Countries

Systems Research for Optimizing Future Land Use in South and Southeast Asia

Top researchers share their expertise on conservation and sustainability in areas that extend across national borders! This informative and insightful book examines strategies being used by governments and NGOs to protect wild areas that cross national borders and cultural, linguistic, and socioeconomic boundaries. In addition to presenting case studies from five continents, Transboundary Protected Areas: The Viability of Regional Conservation Strategies provides several theoretical overviews that suggest viable approaches to conserving biodiversity in these difficult-to-protect areas. From the editors: "Historically, the borders of protected areas have been defined by convenient social, political, or proprietary boundaries rather than by ecological boundaries. Today, many scientists and practitioners are in agreement that the world's biodiversity and other natural resources can best be conserved on an ecosystem or regional scale, which may or may not be consistent with political boundaries. Efforts to protect land on an ecosystem scale have led to the creation of numerous transboundary protected areas, also referred to as international peace parks or transfrontier conservation areas. These areas, which often cross linguistic, socioeconomic, and cultural boundaries as well as national borders, represent regional conservation at its most complex. While many scientists and practitioners promote eco-regional approaches to conservation, many also advocate pursuing conservation goals on local or community scales. Conservationists therefore endeavor to achieve a seemingly incongruous mandate: to pursue top-down (regional) goals using bottom-up (local) approaches." Transboundary Protected Areas: The Viability of Regional Conservation Strategies addresses the vital questions associated with this mandate: Is it reasonable and realistic to approach regional conservation this way? What strategies have been employed to achieve these goals—and how successful have they been? Who benefits from transboundary conservation—and what are the costs? Reflecting the information delivered at the 2001 conference of the Yale chapter of the International Society of Tropical Foresters (ISTF), this book provides you with the best answers available at this time. The contributors include social and natural scientists, resource managers, policymakers, and community leaders. Transboundary Protected Areas: The Viability of Regional Conservation Strategies brings them together for an interdisciplinary exploration of these questions and other critical issues related to conservation in and around transboundary protected areas. Specific cases that are thoughtfully examined in Transboundary Protected Areas: The Viability of Regional Conservation Strategies include: the public reaction to the Yellowstone to Yukon (Y2Y) Conservation Initiative the ways in which the establishment of southern Africa's existing and proposed Transfrontier Conservation Areas (TFCAs) can help conserve biodiversity, aid socioeconomic development, and promote international peace development and conservation efforts in the Maloti-Drakensberg mountains of southern Africa, which straddle the borderlands between South Africa and Lesotho the cultural aspects of protected area management in Venezuela and Guyana the impact of transfrontier collaboration as evidenced by the International Gorilla Conservation Programme (IGCP) in the Virunga-Bwindi region of Africa (Uganda, Rwanda, and the Democratic Republic of Congo) how the Nepalese have addressed the problems of poaching, commercial logging, illegal harvesting and smuggling of forest products, and illegal trade of wildlife and wildlife products in the eastern Himalayas by implementing a transboundary biodiversity conservation initiative Helpful maps, tables, and figures make geographical regions and conservation information easy to assimilate.

Systems approaches for agricultural development are needed to determine rational strategies for the role of agriculture in national development. Mathematical models and computer simulation provide objective tools for applying science to determine and evaluate options for resource management at field, farm and regional scales. However, these tools would not be fully utilizable without incorporating social and economic dimensions into their application. The second international symposium, Systems Approaches for Agricultural Development, held in Los Baños, 6–8 December 1995, fostered this link between the bio-physical sciences and the social sciences in the choice of keynote papers and oral presentations, a selection of which is included in this book. The book's contents further reflect how systems approaches have definitely moved beyond the research mode into the application mode. The large number and high quality of interdisciplinary research projects reported from different parts of the globe, to determine land use options that will meet multiple goals and yet sustain natural resource bases, is a key indicator of this 'coming of age'. At the farm level, where trade-off decisions between processes and products (commodities) feature strongly, much progress is also evident in the development of systems-based tools for decision making. This book will be of particular interest to all agricultural scientists and planners, as well as students interested in multidisciplinary and holistic approaches for agricultural development.

The importance of livestock; Board of trustees; ILRI's donors in 1995; ILRI's addresses; A global livestock research institute; Moves towards a new institute; Major trends; Developing a medium-term plan; Broadening horizons; Collaboration and integration the names of the game; Live vaccine delivery systems for east coast fever; What is a live delivery system; Why live delivery systems; Progress to date; Attacking the schizont form; Where to now; Mice and cattle immune systems like chalk and cheese; Helper T cells in mice and cattle; Vital reminders; Interpreting the language of parasites; Starting from the parasite; Starting with the host; Promise for the future; GIS – a research tool and beyond; Controlling tick-borne diseases in Zimbabwe; Maximising human benefits, minimising environmental costs; GIS in production-system research; Tools for research and development; Women dairy farmers in Africa; Who should extension workers be talking to; Who does the work; What are the benefits of dairying; Implications for dairy development; Ploughing with cows feasible in East African highlands; Ploughing with cows technically feasible; Farmers test dairy-draft cows on farms; Farmers emphasise milk yields; Moving into new areas with new partners; Toxin-degrading microbe release multi-purpose tree feed potential; To much, too soon; Gradual adaptation; Another string to the farmers' bow; Biodiversity – the future of world food production; Knowing what to conserve; Knowing what has been collected; Knowing what it can do; Keeping it clean; The future of world food production; A library on a disc; A technology for today; ILRI's CD-ROMs; Early days; ILRI programme and project activities in 1995; ILRI senior staff in 1995; Post-doctoral associates and graduate fellows at ILRI in 1995; Publications by ILRI staff in 1995; Financial summary.

Program report, 1997-98

Planning, Design, and Control through Interdisciplinary Methodologies

Proceedings of the Workshop "Soil and Water Quality at Different Scales" held 7-9 August 1996, Wageningen, The Netherlands

Proceedings of a Symposium on Eco-Regional Approaches in Agricultural Research, 12-16 December 1994, ISNAR, the Hague

Pesticides and the Sustainability of Andean Potato Production

Sustainable Food Supply Chains

Selected Papers from a Planning Workshop Held in the Ministry of Agriculture and Rural Development, Hanoi, Vietnam, October 6-9, 1997

This report summarizes the implementation efforts undertaken when Pres. Clinton asked for: the Council on Sustainable Amer. to begin implementing some of its recommendations; White House offices and Fed. agencies should support the establishment of a Joint Center on Sustainable Communities to implement recommendations in communities across the nation; and the Vice President's effort to implement recommendations with the Admin. Contents: innovative local, state, and regional approaches; new nat'l. opportunities, international leadership, interagency efforts, outreach, and overarching recommendations.

Robert Bailey is an established authority on ecosystems, and his previous works, Ecosystem Geography and Ecoregions have sold well; Fully illustrated with color diagrams and maps; Includes a Glossary to define terms which may be unfamiliar to professionals working in this cross-disciplinary field; Provides a Resource Guide and a Sources and Recommended Reading section to aid readers who require additional information; Presents a modified approach to land management and conservation in a non-technical and engaging manner

Soil degradation causes a shrinking of arable land resources, and the persistence of starvation and malnutrition. The depletion is compounded by the increasing populations of developing tropical nations, and the conversion of agricultural land to other uses. As a result, per capita grain harvesting and irrigated land is in steady decline all over the world. The decrease in horticultural resources and productivity has inspired Soil Quality and Agricultural Sustainability, which is based primarily on papers presented at the 1996 conference on soil degradation, sponsored by Ohio State University, the USAID and the International Agricultural Research Centers. The book addresses itself to six concerns: basic concepts and global issues, nutrient and water inputs, soil quality management in Asia, in Africa, and in the Tropical Americas, and future priorities. The Editor's goal is a new paradigm in soil quality research: a multidisciplinary approach. He proposes that an erosion management program include soil scientists, hydrologists, climatologists, sedimentologists, geographers, agronomists, agricultural engineers, land use planners, economists, anthropologists and social scientists. Lal advocates an optimistic, forward-thinking brand of soil science that concentrates on conservation and fertility. The 26 chapters explore what Lal considers to be the priorities: agricultural sustainability, soil quality, food security, quality restoration, long-term management, and the failure to adopt new technology. In sum, they paint a comprehensive portrait of the current state, and future prospects, for worldwide agronomic viability.

Proceedings of an International Workshop Held at Can Tho, Vietnam 15-19 June 1998

Land use analysis and planning for sustainable food security: with an illustration for the state of Haryana, India

International Potato Center

Regional Environmental Governance and Avenues for the Ecosystem Approach to management in the Baltic Sea Area

Two Concepts, One Goal

Soil Quality and Agricultural Sustainability

With Case Studies for Costa Rica

Systems approaches for agricultural development are needed to determine rational strategies for the role of agriculture in national development. Mathematical models and computer simulation provide objective tools for applying science to determine and evaluate options for resource management at field, farm and regional scales. However, these tools would not be fully utilizable without incorporating social and economic dimensions into their application. The second international symposium, Systems Approaches for Agricultural Development (SAAD), held in Los Baños, 6-8 December 1995, fostered this link between the biophysical sciences and the social sciences in the selection of keynote papers and oral presentations, a selection of which are included in these books. The contents further reflect how systems approaches have definitely moved beyond the research mode into the application mode. The large number and high quality of interdisciplinary research projects reported from different parts of the globe, to determine land use options that will meet multiple goals and yet sustain natural resource bases, is a key indicator of this 'coming of age'. At the farm level, where trade-off decisions between processes and products (commodities) feature strongly, much progress is also evident in the development of systems-based tools for decision making. At the field level optimization of resource use and minimizing environmental effects has become of major concern for which systems approaches are indispensable. The books, of which Volume I deals with regional and farm studies level and Volume II with field level studies, will be of particular interest to all agricultural scientists and planners, as well as students interested in multidisciplinary and holistic approaches to agricultural development.

Business sustainability and sustainable development are of great importance in modern-day socio-economic study. Despite this, the impact of recent contributions from systems and complexity sciences in addressing these issues has not yet filtered down into effective practice.

This book argues that there is a need for urgency in the application of analytical tools which embody the principles of complexity management in sustainability research, in particular in the context of the global climate change. The approach presented is based on the concept of clusters of whole systems coming together through collaboration, in order to create larger wholes capable of dealing with the issues facing our socio-economic environmental systems. In this updated second edition, the authors further clarify the viability and sustainability (V&S) approach, and the criteria and framework needed for sustainable governance. It includes a more detailed perspective on the implications of the V&S approach to businesses and networks towards changes in structure, strategy and processes, inspired by specific case studies. Key additions include a criteria for designing more viable and sustainable self-governed organizations, the methodologies and tools to design and implement self-transformations towards sustainability, and how these tools support sustainability management individually and globally, for businesses and society.

Advances in Agronomy has the highest impact factor among serial publications in Agriculture. The Science Citation Index, 1986, reports an impact factor over 2,459 and a cited half-life over 10 years. Volume 76 contains five excellent reviews on topics of great interest to crop and soil scientists as well as others in various fields. Chapter 1 is concerned with the potential of tropical soils to sequester carbon. Topics that are covered include soil inorganic and organic pools and dynamics, loss of soil organic pools from tropical soils, and potential for C sequestration in tropical soils. Chapter 2 covers the applications of crop/soil simulation models in tropical agricultural systems. Chapter 3 deals with interorganismal signaling in suboptimum environments with emphasis on legume-rhizobia symbiosis. Chapter 4 discusses the surface chemistry and function of microbial biofilms. The authors discuss biofilm formation and matrix architecture and general features and properties. Chapter 5 deals with vegetable crop scheduling and prediction. Topics that are covered include identification of stages of growth and development and experimental approaches for developing scheduling and prediction models. Advances in Agronomy has the highest impact factor among serial publications in Agriculture. The Science Citation Index, 1986, reports an impact factor over 2,459 and a cited half-life over 10 years. Volume 76 contains five excellent reviews on topics of great interest to crop and soil scientists as well as others in various fields. Chapter 1 is concerned with the potential of tropical soils to sequester carbon. Topics that are covered include soil inorganic and organic pools and dynamics, loss of soil organic pools from tropical soils, and potential for C sequestration in tropical soils. Chapter 2 covers the applications of crop/soil simulation models in tropical agricultural systems. Chapter 3 deals with interorganismal signaling in suboptimum environments with emphasis on legume-rhizobia symbiosis. Chapter 4 discusses the surface chemistry and function of microbial biofilms. The authors discuss biofilm formation and matrix architecture and general features and properties. Chapter 5 deals with vegetable crop scheduling and prediction. Topics that are covered include identification of stages of growth and development and experimental approaches for developing scheduling and prediction models.

China's Uncertain Quest for an Ecological Civilization

Agricultural and Environmental Sustainability

Towards an Ecoregional Approach for Natural Resource Management in the Red River Basin of Vietnam

A Progress Report on Sustainable America

Eco-regional Approaches for Sustainable Land Use and Food Production

Eco-regional approaches for sustainable land use and food production

Synthesis of Methodology Development and Case Studies

Since the 1980s many developing countries have implemented macro-economic policy reforms to curb inflation, reduce fiscal deficits and control foreign debt. The policy instruments used, such as exchange rate adjustment, budget cuts, trade policy reforms, public expenditure reviews and privatisation, have different and sometimes opposite consequences for agricultural land use. During the same period awareness was growing that deteriorating soil quality could become a limiting factor to increase or even sustain agricultural production. As a result, food availability and even accessibility for large population groups in developing countries may be jeopardised in the near future. Recently, quantitative models have made useful contributions to understanding the impact of economic policy reforms on the sustainability of land use. They provide a consistent analytical framework to deal with complex issues such as the direct and indirect effects of economic, agricultural, environmental and population policies, the role of market imperfections in transmitting economic policy signals, and the interactions between soil quality, agricultural production and household economic decision making. Different types of models can be distinguished: bio economic models, focussing on the link between farm household decisions and the agricultural resource base, household and village models, examining the impact of the socio-economic environment on farm household decisions, and more aggregate models, analysing interactions between sectors and their implications for sustainable land use.

Plant Biotechnology And Plant Genetic Resources, which boasts a truly international list of contributors with a variety of expertise, thoroughly explores all the major contemporary concerns. It discusses the strategies for the best use of modern biotechnology and precious plant genetic resources to alleviate components associated with global constraints in hunger, environment and health. This book is a valuable resource for scientists and policy makers as the world faces unprecedented challenges in the sustainability and productivity of the global food and fibre system.

Sustainable Food Supply Chains: Planning, Design, and Control through Interdisciplinary Methodologies provides integrated and practicable solutions that aid planners and entrepreneurs in the design and optimization of food production-distribution systems and operations and drives change toward sustainable food ecosystems. With synthesized coverage of the academic literature, this book integrates the quantitative models and tools that address each step of food supply chain operations to provide readers with easy access to support-decision quantitative and practicable methods. Broken into three parts, the book begins with an introduction and problem statement. The second part presents quantitative models and tools as an integrated framework for the food supply chain system and operations design. The book concludes with the presentation of case studies and applications focused on specific food chains. **Sustainable Food Supply Chains: Planning, Design, and Control through Interdisciplinary Methodologies** will be an indispensable resource for food scientists, practitioners and graduate students studying food systems and other related disciplines. Contains quantitative models and tools that address the interconnected areas of the food supply chain Synthesizes academic literature related to sustainable food supply chains Deals with interdisciplinary fields of research (Industrial Systems Engineering, Food Science, Packaging Science, Decision Science, Logistics and Facility Management, Supply Chain Management, Agriculture and Land-use Planning) that dominate food supply chain systems and operations Includes case studies and applications

Annual Report 1995

Plant Biotechnology and Plant Genetic Resources for Sustainability and Productivity

Soil and Water Quality at Different Scales

Sustainable Forest Management and the Ecosystem Approach

Tools for Land Use Analysis on Different Scales

Economic, Environmental, and Health Tradeoffs in Agriculture

Transboundary Protected Areas