ECONOMICS OF INDUSTRIAL ECOLOGY

MATERIALS, STRUCTURAL CHANGE,
AND SPATIAL SCALES

AND MARCO A JANSSEN

Stanley Manahan, Stanley E. Manahan

Economics of Industrial Ecology Jeroen C. J. M. van den Bergh, Marco Janssen, 2004 Studies that integrate scientific technological and economic dimensions of industrial ecology and material flows The use of economic modeling techniques in industrial ecology research provides distinct advantages over the customary approach which focuses on the physical description of material flows The thirteen chapters of Economics of Industrial Ecology integrate the natural science and technological dimensions of industrial ecology with a rigorous economic approach and by doing so contribute to the advancement of this emerging field Using a variety of modeling techniques including econometric partial and general equilibrium and input output models and applying them to a wide range of materials economic sectors and countries these studies analyze the driving forces behind material flows and structural changes in order to offer guidance for economically and socially feasible policy solutions After a survey of concepts and relevant research that provides a useful background for the chapters that follow the book presents historical analyses of structural change from statistical and decomposition approaches a range of models that predict structural change on the national and regional scale under different policy scenarios two models that can be used to analyze waste management and recycling operations and adopting the perspective of local scale an analysis of the dynamics of eco industrial parks in Denmark and the Netherlands The book concludes with a discussion of the policy implications of an economic approach to industrial ecology Sustainable Marketing Robert Dahlstrom, Jody Crosno, 2024-01-22 Formerly published by Chicago Business Press now published by Sage Sustainable Marketing Third Edition presents a sustainable marketing perspective that addresses financial and social performance as well as ecological performance in consideration of the impact upon the environment in which markets operate Authors Robert Dahlstrom and Jody L Crosno incorporate state of the art examples of business practice while delivering on a theoretically based and managerially relevant approach to sustainable marketing The Dynamics of Regions and Networks in Industrial Ecosystems Matthias Ruth, Brynhildur Davidsdottir, 2009-01-01 Industrial ecology provides a rigorous and comprehensive description of human production and consumption processes in the larger context of environmental and socioeconomic change This volume offers methodologies for such descriptions with contributions covering both basic and advanced analytical concepts and tools to explore the dynamics of industrial ecosystems concentrating specifically on regions and networks Each of the book s three parts contains an introduction by a leader in the field as well as chapters ranging from conceptual models to case study applications. The first part offers an introduction to the main themes and issues surrounding regional and networked industrial ecosystems. The subsequent two parts broaden and deepen the discussion with emphasis on the regional and network characters relevant for analysis and management The scale of issues ranges from buildings to regions to entire nations with methods that range from input output analysis to computer assisted simulation games Researchers in the fields of industrial ecology ecological economics environmental and energy policy

environmental engineering and resource and environmental economics will find this comprehensive book of great interest The Social Embeddedness of Industrial Ecology Frank Boons, Jennifer A. Howard-Grenville, 2009-01-01 From its inception the field of industrial ecology has taken a distinctly technological approach to understanding and improving ecological consequences of industrial activities Increasingly however scholars and practitioners are developing perspectives on the social embeddedness of industrial ecology the ways in which material and energy flows in regions and product chains are shaped by the social context in which they occur This book presents empirical work addressing how cognitive cultural political and structural mechanisms condition the emergence and operation of industrial ecology Further exploring such mechanisms holds promise for understanding both the barriers to and opportunities for altering the ecological impacts of industrial practice Through contemplative chapters and intermezzos authors with different disciplinary backgrounds reflect on the contribution of work from various social sciences to industrial ecology Unique to the volume the authors of the commentaries bring in their personal and professional experiences reflecting on how they have engaged in or have seen the value in cross disciplinary work They also include discussion explicitly on the dialogue and its value to the evolution of the field In these ways the book develops the dialogue between social science contributors and researchers from other disciplines within the field of industrial ecology Scholars and students involved in the study of industrial ecology and related fields as well as practising managers and those involved in facilitating industrial ecology projects around the world will find this engaging and comprehensive volume indispensable Economic Growth, Material Flows and the Environment Rutger Hoekstra, 2005-01-01 This volume provides a valuable introduction to hybrid I O analysis and therefore should be useful to the growing number of researchers working with these techniques Timothy J Considine Journal of Industrial Ecology This is a first rate piece of work Dr Hoekstra's book is the most comprehensive assessment of economic decomposition analysis to date The author has clarified some confusions filled in some important gaps in the literature and extended the methods both conceptually and empirically He has done a most thorough job of constructing hybrid input output tables and applied them to the important issue of trends in material production use His use of SDA for forecasting and backcasting of trends and policy making is also very impressive Adam Rose Pennsylvania State University US Rutger Hoekstra examines the complex relationship between the monetary economy and the materials flows that are extracted and emitted by economic activities These physical flows are responsible for many important environmental problems such as unsustainable resource depletion waste production and climate change This book discusses applies and improves upon techniques which link the monetary and physical economies for environmental analyses The book uses two sources of analysis the physical input output table PIOT a macro economic account for the physical economy recording material and product flows including resource extraction emissions and recycling and structural decomposition analysis SDA which assesses the influence of structural changes such

as economic growth consumption shifts export growth and technological change on environmental indicators Methodological

improvements in the PIOT and SDA systems are then presented by the author and applied to empirical data Ecological and industrial economists along with those with an interest in environmental problems associated with the economy will find this book with its extensive historical analysis and novel fore and back casting models to be a fascinating read Change and Sustainable Development Mohamed Abdel Rahim M. Salih, 2009-01-01 this book gives a good overview of major challenges facing policy makers researchers and ultimately humankind in dealing with climate change The reader also gets a good understanding of how fragmented and transversal the issues of climate change and sustainable development are Quarterly Journal of International Agriculture a unified useful and stimulating book which should act as a springboard for further work into what is a very topical and extremely important issue for everyone in the world not just academics and policymakers This book serves its intended audience but also deserves to be more widely read World Entrepreneurship Society Too often writings on climate change are placed into two categories climate change deniers and climate change supporters What this timely and insightful collection of Mohamed Salih s does is to problematise the issue taking the debate to a level where it desperately needs to be asking the thorny questions of how do the politics and international relations of climate impact upon the most vulnerable the least affluent the dwellers of the majority world In short Salih challenges us How did the climate change about climate change The responses of his contributors are salient to the point sometimes disturbing but always thought provoking Timothy Doyle Keele University UK Editing the proceedings of a symposium into a cogent and coherent book is no easy task This book a tribute to Professor Opschoor is no exception with disperse contributions of some highly acclaimed authors covering a wide spectrum of themes It is a credit to Professor Salih s insight to string them together in the introductory chapter and entice the reader to read on This book has food for thought on many fronts reaching far beyond climate change as did the oeuvre of Hans Opschoor an instructive read Paul Vlek Center for Development Research ZEF Bonn Germany It is difficult if not impossible to formulate and implement sustainable policy without first understanding the dynamic relationships between nature society economics and technology and research plays a pivotal role in this regard Climate Change and Sustainable Development is an important book which deals with these issues in the context of climate change and the changing global context of development It alerts us to the relationship climate change has with two urgent tasks poverty reduction and sustainable development which require efforts that span countries regions and communities In this interdependent world argue the authors a shared vision and common effort are vital to sustaining our life support system It is a must read Jacqueline Cramer The Netherlands Minister for Spatial Planning and the Environment This unique book provides cutting edge knowledge and analyses of the consequences that climate change will have for sustainable development and poverty reduction within the context of global development Exploring alternative resource management approaches including federal resource management governance ecosystem services digital dematerialization ecological cities biofuels versus food and children and climate change this innovative volume provides fresh insights on the human condition with regards to the current debates on climate change The distinguished contributors examine climate change induced processes that present profound challenges to sustainable development and poverty reduction at the local national and global levels This groundbreaking study will be a welcome addition for graduate and post graduate students in development and environmental studies It will also have great appeal to scientists policy makers and researchers in these fields Regional Development: Theory and Practice Baleshwar Thakur, H.S. Sharma, Suresh Misra, S. Chattopadhyay, Surendra Singh, 2017-01-01 The Five Volume Series on Regional Development Theory and Practice is a festschrift dedicated to Professor R P Misra a distinguished scholar widely recognized as one of the pioneers who initiated and promoted Regional Planning studies in India This five volume series with over one hundred research papers on different aspects of regional development is a fitting tribute to the scholar who spent much of his life time thinking researching and writing about development in general and regional development in particular These five volumes each dealing with a specific aspect of regional development Vol 1 Concept of Regional Development Vol 2 Measuring Development Vol 3 Development Patterns and Structures Vol 4 Development Policies and Vol 5 Development Challenges Each of the five volumes begins with an introduction which is unique in the sense that this is not merely an introduction to the contributions contained in the volume but also talks of the theory of regional development contemporary development in the discipline and the contrarian views expressed by various academics and policy makers Another significant aspect of these introductions is the global view and a comparative scenario of the developed developing and under developed economies of the world that the editors have kept in view in a debate seeking an universal theory of regional development Regions are specifics and often unique and regional development implies focusing on the assets of the territory its potential and constraints Sustainable **Development and Environmental Management** Corrado Clini, Ignazio Musu, Maria Lodovica Gullino, 2010-06-29 This book stems from a four year experience of a Training Programme addressing members of several Chinese governmental Institutions which given the moment of extremely intense and fast development of their country consider the issues of environment and sustainable growth among the foremost priorities In particular they expressed the need and will to develop policy and mana ment tools that could lead to a strategy of sustainable growth from an economic social and environmental point of view The Programme turned out to be a success it involved up to June 2007 more than 2000 trainees from almost all the Provinces of China precisely because the forces that answered those needs are extremely diverse as to include the academia national and local governments public institutions private companies and international agencies Following this feature the book s contributors have been selected among more than 300 professors researchers policy makers and entrepreneurs involved in the Training activities thus offering different approaches to the key questions of environmental Research Tools in Natural Resource and Environmental Economics Amitrajeet A. Batabval, Peter management Nijkamp, 2011 Key Features First book of its kind in the field Examines and analyzes how key tools are used to conduct

theoretical and empirical research in natural resource and environmental economics in contemporary timesCompiles various articles and accounts concerned with the relevant pedagogical discussionWritten by recognized experts and prominent international researchers in the field Handbook of Creative Cities D. E. Andersson, E. Andersson, Charlotta Mellander, 2011-01-01 With the publication of The Rise of the Creative Class by Richard Florida in 2002 the creative city became the new hot topic among urban policymakers planners and economists Florida has developed one of three path breaking theories about the relationship between creative individuals and urban environments. The economist ke E Andersson and the psychologist Dean Simonton are the other members of this creative troika In the Handbook of Creative Cities Florida Andersson and Simonton appear in the same volume for the first time. The expert contributors in this timely Handbook extend their insights with a varied set of theoretical and empirical tools. The diversity of the contributions reflect the multidisciplinary nature of creative city theorizing which encompasses urban economics economic geography social psychology urban sociology and urban planning The stated policy implications are equally diverse ranging from libertarian to social democratic visions of our shared creative and urban future Being truly international in its scope this major Handbook will be particularly useful for policy makers that are involved in urban development academics in urban economics economic geography urban sociology social psychology and urban planning as well as graduate and advanced undergraduate students across the social sciences and in business Environmental Chemistry Stanley Manahan, Stanley E. Manahan, 2009-12-17 The field of environmental chemistry has evolved significantly since the publication of the first edition of Environmental Chemistry Throughout the book s long life it has chronicled emerging issues such as organochloride pesticides detergent phosphates stratospheric ozone depletion the banning of chlorofluorocarbons and greenhouse warming D **Solutions** Axel Lindfors, 2020-04-08 Sustainable development is one of the most influential visions guiding future societies Encompassed within its vision are various domains where improvements are desirable such as social equity environmental degradation climate change In the work towards sustainable development firms government authorities and individuals face various practical challenges tied to these sustainability domains When facing these challenges they may implement sustainability solutions that is solutions that are framed in the context of contributing to sustainable development This thesis deals with a particular sub set of such sustainability solutions namely integrative and multi functional solutions These solutions are characterized by the ability to provide different functions through value creation within several different sustainability domains and require organisations or units of organisations to further integrate material energy and informational flows in order to implement the solution Integrative and multi functional solutions may play an important part in the transition towards sustainable societies since the integration of material energy and informational flows may bring with it synergistic benefits Furthermore the contribution of these solutions to several different sustainability domains reduces the risk of problem shifting and it may be more cost efficient to have one multi functional sustainability solution than

to have one for each sustainability related challenge However if integration and multi functionality are desirable characteristics of future socio technological systems we need ways to systematically assess them and facilitate their implementation When it comes to the assessment there is a need to find an assessment methodology that can handle capturing the synergistic benefits and multiple functions of such solutions Furthermore the methodology also has to conform to the value pluralism inherent to sustainable development Dealing with this value pluralism when trying to assess which solution among many to implement can be challenging as comparative judgements have to handle potentially conflicting value orientations goals empirics and ontologies As for the facilitation of their implementation integrative and multi functional solutions tend to be more difficult or at least different to implement than traditional single minded solutions since they require traditionally separate organisations to cooperate Therefore this thesis aims to contribute to understanding the process of implementing integrative and multi functional solutions Specifically the thesis explores how to select indicators for assessment how assessments may aid decision makers to deal with the value pluralism of sustainable development when making comparative judgements and how to strengthen the internal capacity of groups of actors to engage in collective action Regarding the selection of indicators the thesis suggests two different pathways Either one may base indicator selections on stakeholder discussions where stakeholders come to a consensus around which indicators are important to assess or one may base indicators on operationalising pre defined sustainability objectives namely sorting contextualising and reformulating pre defined sustainability objectives so that they fit the purpose of the assessment A mix of both pathways is also possible in other words using both stakeholder discussions and the operationalisation of pre defined sustainability objectives to motivate and justify the selection of indicators As for how assessments may aid decision makers the thesis advocates for a discursive approach based on the primacy of decision support tools over decision making tools Meaning that the tools should support informed decisions but not make them for the decisionmaker Here contributions are made in the form of motivations for the discursive qualitative approach to decision making and exemplify how decision support tools may be designed and a method is presented and developed that enables this kind of informed comparative judgements This method builds on multicriteria decision analysis methodology but makes a few key contributions to the selection of indicators mentioned previously and to how to compare different alternatives and judge which of the alternatives is the preferred Finally contributions are made to the practice of facilitating integrative and multi functional solutions through showing how the theory of institutional capacity building can be used to guide design development and evaluation of interventions aimed at facilitating such solutions Institutional capacity building represents the ability of groups of actors to engage in collective action something that seems to be often needed to implement integrative and multi functional solutions Historically this theory has been used to study how different events influenced the capacity of actors to engage in collective action However in research performed within the bounds of this thesis the theory is expanded for use in a proactive manner thereby

contributing with insights and inspiration to others that may seek to facilitate the implementation process of integrative and multi functional solutions Frontiers of Environmental Input-Output Analysis Shigemi Kagawa, 2011-08-26 Input Output Analysis IOA is widely used in the field of ecological economics industrial ecology and environmental sciences Industrial Ecology IE and Ecological Economics EE are promising and growing fields IOA plays a crucial role in analyzing the related environmental and resource issues and providing quantitative information to many research questions and policy implications The major aim of this book is to provide not only a comprehensive overview of environmental IOA from 1930s to the present but also the frontiers of environmental IOA including energy structural decomposition analysis spatial energy structural decomposition analysis multi regional waste make use analysis augmented waste input output analysis dynamic structural decomposition analysis with product lifetime distributions and endogenous input output analysis with product lifetime distributions to professionals practitioners and students This book presents a novel dynamic structural decomposition analysis to evaluate the effects of the product lifetime shifts and structural changes such as technological changes and final demand shifts on the life cycle energy consumptions It also contributes to modelling a simple social accounting method with cumulative product lifetime distributions and argues how product lifetime extension affects energy consumptions and income flow throughout the entire economic system The book demonstrates the author's expertise in IOA and is an essential read for students and scholars in the field **Rethinking Climate Change Research** Pernille Almlund, 2016-04-08 The problems and debates surrounding climate change possess closely intertwined social and scientific aspects This book highlights the importance of researching climate change through a multi disciplinary approach namely through cultural studies communication studies and clean technology studies. These three dimensions taken together have the ability to constitute a positive agenda for climate change science in its broader understanding To cope with the climate change challenge not only do we need new energy efficient technologies other ways of living and new ways to communicate but we especially need new ways to start thinking about climate change across disciplines and backgrounds We need to begin thinking across engineering cultural science and communication in order to create innovative solutions as well as to generate optimistic and progressive narratives about the future Accentuating these softer scientific disciplines their overlaps and the positive discourses they can create this book provides some more profoundly researched themes pertaining to climate change and by that strengthening the analytical as well as the integrative approaches toward the fundamental questions at stake Sustainable Resource Management Stefan Bringezu, Raimund Bleischwitz, 2017-09-08 Looking at material flows industrial and societal metabolism and their implications for the economy this book provides radical perspectives on how the global economy should use natural resources in intelligent ways that maximise well being without destroying life supporting ecosystems Environmental Literacy in Science and Society Roland W. Scholz, 2011-07-21 In an era where humans affect virtually all of the earth s processes questions arise about whether we have sufficient

knowledge of human environment interactions How can we sustain the Earth's ecosystems to prevent collapses and what roles should practitioners and scientists play in this process These are the issues central to the concept of environmental literacy This unique book provides a comprehensive review and analysis of environmental literacy within the context of environmental science and sustainable development Approaching the topic from multiple perspectives it explores the development of human understanding of the environment and human environment interactions in the fields of biology psychology sociology economics and industrial ecology The discussion emphasises the importance of knowledge integration and transdisciplinary processes as key strategies for understanding complex human environment systems HES In addition the author defines the HES framework as a template for investigating sustainably coupled human environment systems in the Social Ecology Helmut Haberl, Marina Fischer-Kowalski, Fridolin Krausmann, Verena Winiwarter, 2016-07-01 This book presents the current state of the art in Social Ecology as practiced by the Vienna School of Social Ecology globally one of the main research groups in this field As a significant contribution to the growing literature on interdisciplinary sustainability studies the book introduces the purpose and nature of Social Ecology and then places the Vienna School within the broader context of socioecological and other interdisciplinary environmental approaches The conceptual and methodological foundations of Social Ecology are discussed in detail allowing the reader to obtain a broad overview of current socioecological thinking Issues covered include socio metabolic transitions socioecological approaches to land use the relation between actor centered and system approaches a socioecological theory of labor and the importance of legacies as conceived in Environmental History and in Long Term Socio Ecological Research To underpin this overview empirically the strengths of socioecological research are elucidated in cases of cutting edge research introducing a variety of themes the Vienna School has been tackling empirically over the past years Given how the field is presented reflecting research carried out on different scales reaching from local to global as well as from past to present and future and due to the way the book is structured it is suitable for classroom use as a primer and also as an overview of how Social Ecology evolved right up to its current research frontiers Sustainability: Multi-Disciplinary Perspectives Heriberto Cabezas, Urmila Diwekar, 2012-11-14 The concept of sustainability is inherently multi disciplinary because it concerns a complex system having economic technological ecological political and other perspectives Consequently any effort in the area of sustainability involves concepts principles and methods from engineering the social sciences including economics and social psychology the biological sciences including ecology and the physical sciences Sustainability Multi Disciplinary Perspectives discusses multidisciplinary aspects of the salient concepts principles and methods relevant to sustainability in a coherent and comprehensive manner Topics covered range from green engineering and sustainability metrics to infrastructure and Sustainability Indicators Tomás Hák, Bedrich Moldan, Arthur Lyon Dahl, 2012-09-26 While the environmental policy concept of sustainability has been widely embraced it has been only vaguely defined and is exceedingly difficult to measure

Sustainability indicators are critical to making the broad concept of sustainability operational by providing specific measures by which decision makers and the public can judge progress Sustainability Indicators defines the present state of the art in indicator development It presents a comprehensive assessment of the science behind various indicators while placing special emphasis on their use as communications tools The contributors draw on their experience as academics and practitioners to describe the conceptual challenges to measuring something as complex as sustainability at local regional national and global scales The book also reviews existing indicators to assess how they could be better employed considering which indicators are overused and which have been underutilized Sustainability Indicators will help planners and policy makers find indicators that are ready for application and relevant to their needs and will help researchers identify the unresolved issues where progress is most urgently needed All readers will find advice as to the most effective ways to use indicators to support decision making Environmental and Economic Impacts of Decarbonization Óscar Dejuán, Manfred Lenzen, Maria Angeles Cadarso, 2017-07-31 On December 12th 2015 at the United Nations Conference on Climate Change held in Paris 195 countries adopted the first ever universal and legally binding climate deal They agreed to decarbonize the economy in order to hold the increase in the global average temperature to well below 2oC relative to the preindustrial levels Although each country is free to design its own strategy on mitigation and adaptation it will be bound to such strategy and is supposed to implement the bulk of the adjustments by 2050 Many questions arise from the Paris Agreement that points to a second Industrial Revolution What are the required changes in the structure of production and in the patterns of consumption What will be their impacts on emissions employment and international trade This book answers these questions from a variety of input output models able to compute the impacts on specific sectors and regions This volume has 17 chapters written by 52 co authors who are specialists in input output analysis and environmental sustainability. They come from 24 universities research centers and international agencies all over the world sharing their commitments to explain important and complex ideas in a way that is understandable to the non experts and experts alike Environmental and Economic Impacts of Decarbonization is a very important read for those who study environmental economics climate change and ecological economics

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