Book Review

Reviewed by Renske Hijbeek
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1. Tropical Forest Community Ecology

by Walter P. Carson and Stefan A. Schnitzer
Published 2008
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The objectives of this multi-authored book as stated in the Preface and Introduction are ambitious:

> "A comprehensive synthesis of tropical forest community ecology was necessary in order to help the field forward. This book is our attempt to make a significant contribution to the field and to ask anew: What are the main theories in tropical ecology, and which ones are supported or refuted by empirical data. Thus, we have attempted to assemble a volume that describes the most up-to-date findings on the important theories of tropical forest community ecology. We hope that this book accomplishes this goal to the degree possible, while at the same time providing a road map of what we know, what we think we know and where future research is most needed."

Effectively, the book constitutes a compilation and evaluation of concepts, theories and views on tropical forest ecology.

Besides the introduction, the book has 27 chapters, divided into five sections: (2) large-scale patterns in tropical communities, (3) testing theories of forest regeneration and the maintenance of species diversity, (4) Animal community ecology and trophic interactions, (5) secondary forest succession, dynamics and invasion, (6) tropical forest conservation.

Though a very good effort was done to subdivide into sections, choices are not always clear. For example, the title of chapter 7 is 'Large tropical forest dynamics: testing explanations for the maintenance of species diversity plots' but it is placed in section 2: 'Large-scale patterns in tropical communities' and not in section 3: 'Testing theories of forest regeneration and the maintenance of species diversity'.

The introduction is really one of the more interesting sections of the book *per se*, because the generally felt need for synthesis, both in the field and in the book, is at least developed to some extent. The take home message of each chapter is given within the entire structure and ambitious objective of the book, but while the preface announces '*a near revolution in our understanding of forest change*', this is however not shown.

As admitted by the editors, the book focuses on plant communities, without however foregoing higher trophic levels, with the arguments that plants are in their field of expertise and that most fundamental questions in tropical ecology today exist at the community level.

Much of the book – Section 2, 3 and 5 – deals with the Neutral Theory of S.P. Hubbell (who authors Chapter 9). This one-sidedness can maybe be motivated, as is done in the second chapter and emphasised in the introduction ('*the debate over the validity of the Neutral Theory is now behind us*'), but this could then have been reflected in an appropriate subtitle. The other two sections concern trophic interactions – Section 4 – and an advocacy for ecologist involvement in forest conservation – Section 6.

In general, comparison between tropical and non-tropical forests (what are the differences and what are the similarities?) could have been developed more, in order to address a wide audience. It may not have been the focus of the book, higher latitude biomes are globally discussed in major comparisons and a biogeographical analysis (chapter 3), but altogether non-tropical forests appear to be a different ecological subdiscipline. Besides the above biogeographical survey, a good comparison with temperate forests is found on p.387 discussing the recovery of forest structure, which is particularly rapid in tropical wet climates, compared with temperate forest succession.

One of the problems in this book (and in the ecological discipline altogether?) is the lack of balance between specificity and generalisation; generalised ecological theories are backed up by empirical evidence from various species in different local settings that are difficult to compare in order to come to a common understanding. Besides this, much of the evidence to back up literature comes from the same research and sometimes the same research sites, with one obvious example: research at the Barro Colorado Island, occurring as location for data sets in at least seven chapters.

The main set-up of many chapters is the presentation and discussion of theories, followed by one or more case-studies, as empirical evidence to back up theory. This causes both redundancy and lack of coherence (niche-assembly theories, dispersal-assembly theories, neutral theory, theories for species diversity, structure and community dynamics, negative density dependence and canopy disturbance, gap specialisation), leaving the reader somewhat confused. Maybe a better approach for the book chapters would have been, per section a discussion of theory or theories, a literature survey and background, followed by empirical findings.

A same and coherent usage of key terms in the text is important: for example, what is a community? This is not set forward in the book and is not very clear to the reader whether the same definition was used throughout all contributions. Additionally, listing theories in an annex with good references and key points would have brought the book closer to its ambitious objectives of synthesis and near revolution in our understanding.

Finally, some conclusions are comprehensive, but trivial at the same time, such as: 'The impact of gaps on the maintenance of species diversity and forest regeneration likely varies over large-scale environmental gradients', p.204, Ch. 12.

Globally, this book is not very readable from head to tail, though after reading the Preface the reader would expect much synthesis. There is little added value above reading the single contributions as review articles. This lack of synthesis and chapter 'interaction'

is not improved because of redundancy and differences in level and style of the various contributions.

However, it must be clearly stated that it is a very interesting compilation. The book is excellent and timely to generate ideas for future research questions, to have in one volume reviews of the latest contributions to (particularly) plant ecology in the tropics and some hypotheses. In spite of the negative points regarding synthesis (which is, admittedly, an extraordinarily difficult task), it is a recommendable and stimulating volume.

Book Review

Reviewed Torsten Wiedemann

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1. The Biofuel Delusion
by Mario Giampietro and Kozo Mayumi
Published 2009
by Earthscan, London, UK, 318 pages
ISBN: 978-1-84407-710-6

Large scale agro-biofuels (simply called 'biofuels' in this review) are widely known as sustainable, CO_2-neutral solutions for two major challenges: climate change and peak oil. The production of biofuels and supporting scientific research are still promoted and financed massively by governments worldwide.

'The Biofuel Delusion' tries to explain how it was possible that so many scientists, economists and politicians could believe in this fairy-tale, while it is only logical that win-win-win solutions (as which the biofuel-story is sold) are impossible on a finite planet. Every 'winner' requires a 'loser' and in the case of biofuels the losers are food production (owing to concurrent land-use), biodiversity, CO_2 emissions (industrial agriculture and mono-cultures lead to negative impacts on CO_2 emissions) and people's well-being (e.g., by disordering agricultural communities).

The authors are experienced experts in complex systems theory applied to the analysis of sustainability of agricultural food production, ecological economics and energy analysis.

The book consists of 10 chapters, addressing four major questions:

1 Can fossil fuels (or at least a significant percentage) be replaced by biofuels?

2 How should this question been answered scientifically?

3 Why and how has society been carried away with the biofuel madness?

4 What may we really expect from the future?

The main answers are:

1 Feeding the Earth's ever-growing population and maintaining present consumption patterns is made possible only by using fossil fuels. Replacing fossil fuels by biofuels is like stepping forward into the past, which is an impossible step, at least with present-day global population and consumption patterns: replacing only 3% of the total energy consumption in the USA by replacing 10% of fossil fuels in the transport sector by biofuels, eventually means that the agriculture surface has to extend 11 times and half of the US workforce would have to work in agriculture.

2 Energy analysts often use very simple models to calculate solutions for the future production of energy carriers: replacing fossil fuels by biofuels is like a heart-transplantation to a complex organism. This kind of surgery requires profound preparation, very careful analysis and complex solutions, if we want to guarantee that the new heart will be able to correspond with the required speed, amount and quality of blood which has to be pumped through the given organism.

3 This knowledge is not new, but due to massive propaganda and lobbying scientists were blinded. Especially this fact is very alarming: scientists believe that they argue in a sound, objective, logical and independent way. But in the past too many papers have been published, based on simple models and neglecting 'available wisdom'.

4 Eventually these solutions can only be found after the collapse of present-day metabolism, when mankind will be forced to adapt to a new situation.

The authors not only prove all these positions in a scientific way (their argumentation is sound and will be hard to dispute), they also deliver tools that can and should be used to address this kind of discussion. Their models applied to the metabolism of socio-economic systems allow us to explore the option space for different solutions. If we want to discuss seriously about regenerative energy sources and carriers as potential substitutes for fossil energy sources, every potential solution should be assessed with this kind of complex bio-metabolism models, in a multidisciplinary, holistic approach. After reading this book it will be hard to find arguments defending biofuels as a sustainable solution. Before any scientist develops new ideas about sustainable solutions for our future production and consumption patterns for energy carriers, he should make himself aware of the complexity of the bio-metabolism of societies, as it is described by Giampietro and Mayumi.

This book is highly recommended for all students, economists, scientists and politicians interested or involved in decision making related to renewable energy sources, especially those who still believe in biofuels.

Book Review

Reviewed by Lin Van Poucke

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1. Legacies and change in Polar Science. Historical, Legal and Political Reflections on the International Polar Year

by Jessica M. Shadian and Monica Tennberg
Published 2009
by Ashgate Publishing, Farnham Surrey, United Kingdom
ISBN: 978-0-7546-7399-6

Developed in the light of the fourth International Polar Year 2007–2008, *Legacies and Change in Polar Science. Historical, Legal and Political reflections on the International Polar Year* offers a comprehensive study of the development of polar science as an interaction between global geopolitics and field sciences since the first IPY 1882–1883. As the book comprises ten narratives written by different experts in various fields of polar science, a multi-theoretical and interdisciplinary perspective is given on historical developments and current issues in the polar regions. With a specific focus on history, law, politics and science, the authors of the various contributions identify significant steps/impacts in the evolution of polar governance (such as the internationalisation of research and its coordination inspired by K. Weyprecht, the development of an environmental consciousness in the 1960s and 1970s, the participation of non-state actors first in the collection of knowledge and later in the policymaking process, the positioning of states within the global power playing field for instance during the Cold War,…). Especially the relation between science and policy is highlighted owing to the emerging role of environmental scientists as political actors. Since the arising of a global environmental consciousness where the Earth is viewed as a system that is in a state of change, the global society evolved towards a 'knowledge society' that acknowledges the relationship between nature and social thought and consequently the combined foundation of intellectual thought and the political framework.

The book is divided into two parts, one focusing on the Arctic environment and one designated to Antarctica, and offers a comparative perspective of the poles. In Part I 'Whose Arctic?', A.E. Nilsson elucidates how Arctic interests developed beyond the ability to forecast the weather, followed by J.M. Shadian with an in-depth analysis of the shifts in global governance in relation to the participation of non-state actors during the IPYs (scientists, indigenous people, private industry). R. Huebert points out that even though science can guide international cooperation, it cannot create a better international cooperation on its own. The diverse, often political, motives for the construction, positioning and maintenance of IPY field stations within the Arctic are finally overlooked by U. Wråkberg.

Part II, addressing Antarctica, starts with a comprehensive insight into the evolved practice of the Antarctic Treaty System (ATS), followed by a focus on international cooperation and the role of the Scientific Committee on Antarctic Research (SCAR), given by M. Haward and J. Jabour. D. Rothwell offers a legal analysis of the ATS, especially related to Antarctic research and its raising of commercial externalisation. The Chilean attitude regarding possible foreign territorial claims on Antarctica and the development of an Antarctic governance is enlightened by C.L. Woppke. Chile seeks the international recognition of the geographical contiguity between the Andes Mountains and the Antarctic Peninsula and consequently its sovereignty over the Antarctic Region. S. Chaturvedi returns to the issue of biological prospecting in relation to scientific research. Besides the debate on expanding the 'peaceful uses' of Antarctica towards with bioprospecting, he also addresses the possible impacts of bioprospecting in the Antarctic environment and the incompability with the principle that scientific information should be seen as a public good and thus be shared. Finally, M. Tennberg compiles the above into three externalisations of the relationship between power and knowledge in polar science, notably the development of Antarctica as a scientific laboratory related to the principle of territorial control and state sovereignty, the importance and interaction of the polar regions within the global ecosystem (e.g., climate change) and the emerging participation of environmental science in the political progress.

Because this book provides a comprehensive, multidisciplinary presentation of how polar science has evolved towards a fixed value for global environmental political progress, it is a great starting point for any student, scholar or professional who wants to explore polar science as a whole.

Book Review

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1. Planning for climate change. Strategies for Mitigation and Adaptation for Spatial Planners
by Davoudi Simin, Jenny Crawford and Abid Mehmood
Published 2009
by Earthscan, London, United Kingdom
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Climate change is changing the context of spatial planning. While research and publications on the science of climate change have grown tremendously in recent decades, less attention has been paid to the role of spatial planning in developing both mitigation measures to reduce emissions and adaptation measures to ameliorate the effects of climate change.

The problem of climate change has strengthened the environmental dimension in the spatial planning discipline and become a new rationale for coordination actions and integrating different policy priorities.

In many new long-term vision plans, structure plans, and master plans, the topic of climate change is nowadays a hot issue in the scenario-discussions worldwide.

This book aims to map out the main challenges (economic, social, environmental) for spatial planning that have been created by climate change, in order to encourage further debate and deeper engagement by urban and regional planners (academics and practitioners).

The book has a wide ranging scope, with 23 contributions structured under three parts. Part 1 'The challenge of climate change' aims to unpick the complexity and contested nature of climate change with particular emphasis on urban forms and the role of spatial planning. It explores three main themes: the interface between mitigation and adaptation, urban form and development patterns, and vulnerability to climate change.

Part 2 'Strategic spatial responses' describes how strategic frameworks and planning processes have been responding to the climate change challenge (mitigation and adaptation). It includes examples from different parts of the world that illustrate the development of new paradigms for spatial planning and the challenges of policy integration and diversity.

Part 3 'Implementation, governance and engagement' focuses on emerging tools and methods for spatial planning and the significance of governance. The themes explored in this part of the book include the role of scenarios and modelling, policy implementation, governance and public engagement.

The book provides an overview of emerging practice with analysis of the drivers of policy change and practical implementation of measures. It scopes planning issues and opportunities at several spatial scales, drawing on both the UK experience and other experiences and highlighting the need to link global and local responses to shared risks and opportunities.

This book opens new channels of shared learning among researchers, practitioners and decision makers about what is one of the most challenging and cross-cutting global issues of the 21st century.

As lead partner of an ongoing Flemish Strategic Basic Research project (CcASPAR: Climate Change and Changes in Spatial Structures in Flanders, 2009–2013) the book gives valuable information on three tracks: methodology, strategy and implementation.