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## **Book Reviews**

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**Reviewed by Luc Hens**

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- 1 Pollution Prevention: Sustainability, Industrial Ecology, and Green Engineering**  
**by: Ryan R. Dupont, Kumar Ganesan and Louis Theodore**  
**Published 2017**  
**by CRC Press, Taylor and Francis Group**  
**6000 Broken Sound Parkway NW, Suite 300,**  
**Boca Raton, FL 33487-2742, USA, 608pp**  
**ISBN: 13-978-1-4987-4954-1 (hardback)**

Our vision of how to deal with the industry-environment interface changed fundamentally during the last decades. Fifty years ago, inventorying problems, documenting the issues, and keeping things under control, prevailed. This approach was characteristic for a defensive, sometimes negating attitude. Gradually, the concept of pollution prevention developed supported by striving towards sustainable, long-term options, but also by science (e.g., green chemistry and engineering), management and policy. This book provides a unique, both wide and in-depth, review of this wide scope of pollution prevention related background and issues.

The book is structured in eight sections presenting a most accessible logical flow. They cover 42 chapters in total.

Section 1 is about the fundamentals of pollution prevention with a focus on waste management. Four chapters deal with the concepts of pollution prevention, sustainability, industrial ecology, green science and engineering.

Section 2 provides a summary of the pre-knowledge for this book. It reviews units, properties of materials, and fundamentals in physics.

Section 3 reviews engineering and environmental management basics. The seven chapters deal with processes and equipment, hazards and risks, and provide economic considerations.

Section 4 entails five chapters on pollution prevention principles, including control, source reductions, recycling and ISO standards for environmental management systems.

Section 5 is the most extensive part of the book. Twelve chapters describe the processes, waste, and pollution prevention options in a wide array of traditional environmentally impacting sectors, such as printing, metals, electronics paints, pesticides, petroleum refining and transport. Also, newer sectors such as nanomaterials make part of the discussion.

Section 6 expands the material of Section 5 to include domestic and institutional applications. The considerations on hospital waste are most worthwhile reading.

Section 7 illustrates the sectors discussed in Section 5 with 23 case studies. Of each of them, the problem is described next to the pollution prevention options.

Section 8 provides pollution prevention and sustainability resources. These include state programs, software and internet aids.

This is an impressive book. In 608 pages, it addresses a broad range of environmental issues, paying attention to technical, environmental, social, economic, ethical and policy aspects. It covers waste prevention in a wide range of industries. It does so in a systematically and didactical way. This latter aspect is strengthened by the ‘homework problems’ that different chapters entail, making the text most useful for seminars and other training sessions. The text is such that it can be used either as a starting point for those who enter the field of pollution prevention and/or as a reference text for professionals.

As such the book will be most useful for engineers, environmental researchers, technicians, maintenance personnel and students. A most valuable addition to any environmental library.

**2 Human Ecology Studies and Higher Education for Sustainable Development: European Experiences and Examples**  
**by: Angela Franz-Balsen and Lenelis Kruse**  
**Published 2016**  
**by Oekom**  
**Waltherstasse 29, 80337 München, Germany, 165pp**  
**ISBN: 978-3-86581-299-5**

Human ecology as a science discipline investigates the interrelations and interactions between society, humans and the environment. Its core is a holistic, interdisciplinary approach that combines data of fundamental sciences with those stemming from applied and human sciences. This comprehensive approach interlinking physical, socio-cultural, economic and policy aspects should result in a more comprehensive understanding of the contemporary environmental problems that humans are (prominently) involved in. This interdisciplinary approach links human ecology with sustainable development. The latter one offers an analysis of the same issues interlinking merely environmental with social and economic aspects.

This book collects higher education initiatives of both approaches in Europe. The introduction sets the scene of overviewing the history of human ecology (traced back to the Chicago School of Sociology in the 1920s), its development in Europe and its links with sustainable development. Next to this introductory chapter, the book entails two main sections. ‘Times of change – new paradigms, new academic cultures’, as a focus on challenges of academic teaching and learning. The first chapter in this section also takes an historical approach, detailing the introductions. It draws a line from the ancient Greeks to modern times, showing how knowledge and practice changed in Western societies. The integrating and integrative attitude is illustrated using two examples: an EU ALFA funded joint program between EU and Latin-American universities, and the ‘Regional Centre of Expertise on Education for Sustainable Development’. A second chapter in this section is on ‘Student initiatives on sustainable development’ illustrating how students can establish self-organising curricula and do not have to wait until their university offers programs on sustainable development. The main section of the book entails chapters providing examples of curriculum development in

Germany, Sweden, Switzerland, the Netherlands and Poland. Both successes and failures are included.

A short concluding chapter by the editors is about the main challenges for higher education programs on human ecology and sustainable development in Europe and in the world: cooperation, lifelong learning and strategic thinking are identified and discussed.

As a whole, the case studies in this book show the most needed innovation in thinking about curricula in human ecology and sustainable development. This is a most necessary and timely publication. Necessary as it provides inspiration on the drivers of curricula on both subjects. Timely as it not only sits within the framework of the UNESCO Decade of Education for Sustainable Development, but also because in many European universities reductionist approaches prevail over interdisciplinary ones.

The contributions to this book originate from a debate on stimulating joint forces between human ecology and sustainable development organised by the German Society of Human Ecology and the German Leuphana University in 2007. It is the most recent addition to a very nice series of books on a range of aspects of human ecology by the German society.

### **3 The Galápagos: A Natural Laboratory for the Earth Sciences**

**by: Karen S. Harpp, Eric Mittelstaedt,  
Noémi d'Ozouville and David W. Graham**

**Published 2014**

**by John Wiley & Sons, Inc.**

**New Era Estate, Oldlands Way, Bognor Regis,  
West Sussex, PO22-9NQ, UK, 427pp**

**ISBN: 978-1-118-85241-5 (hardback)**

Most of us associate the Galápagos with Charles Darwin's evolution theory, based on a series of concepts which still stand. Darwin remarked the unique fauna and flora of the islands. Next to the biology, the geology of this Ecuadorian island provides a constant intellectual inspiration.

The fascination with the origin of life and the deep Earth continues to motivate scientists. This book provides a convincing illustration. It offers full papers presented at Interdisciplinary Chapman Conference held in the islands in August 2011. Its primary objective was to integrate geological, geochemical and geophysical data on the islands in an interdisciplinary way, thus contributing to our knowledge on the evolution of ocean island systems.

The aim is materialised by this monograph, which collects 18 papers aiming at connecting the geology and biology of these particular ecosystems. Most of the chapters deal with the geophysical aspects of the islands. Highlights include:

- the geology (origin plate tectonics and dynamics) of the 3 km thick platform of which the islands are the surface
- the hydrology and climate
- the sub-lithosphere phenomena, magma and the mantle plume.

Overall, this book uses case studies to focus on the geology, the geochemistry and the physics of the islands, but much less on the geo-biological interaction. On its multi-disciplinary character, the editors contribute a most interesting introductory chapter. Unfortunately, a concluding chapter on the links and integration of the wealth of the data provided is lacking. Consequently, the subtitle of this monograph, *A Natural Laboratory for the Earth Sciences* is only partially discussed.

This is a complete book which entails interesting forewords on Darwin's perspective and the natural laboratory character of the Galápagos. The 12 pages long index is most detailed.

This monograph is published in a luxury way. The result is a beautiful book, hard cover and 427 pages printed on high quality paper. This makes this book a collector's item.

Over 50 North and Latin-American researchers contributed to this book, which was edited by four eminent colleagues in geology and climate sciences from the USA and France.

This book is a must for a wide group of researchers and consultants in geosciences and all of us who are active in the interphase between geology, environment, biology and geography.

#### **4 Can We Feed the World Without Destroying It?**

**by: Eric Holt-Giménez**

**Published 2018**

**by Polity Press**

**65 Bridge Street, Cambridge CB2-1UR, UK, 140pp**

**ISBN-13: 978-1-509-2200-2**

**ISBN-13: 978-1-509-2201-9 (pb)**

Many of us learned that hunger in the world was not a matter of amounts of food – there is sufficient to feed even an increasing population – but rather a time-space problem: hunger crises in particular are a matter of insufficient amounts of food in particular localities for a short period of time. The international food system based on selected varieties, impacts of chemicals as pesticides and fertiliser, and technological effectiveness is more than capable to feed the world and to cope with famine.

At least, the environmental part of the equation dramatically changed during the last decades. The footprint of the food systems increased, biodiversity loss, desertification, deforestation, soil erosion and degradation, and heaps of food waste all contribute to the environmental characteristics of the contemporary food system.

This book goes however beyond an agronomy and environmental analysis of the contemporary food system and its links with hunger and famine. The four chapters in this book offer a political-economy analysis of the situation: that is, the way in which resources, values and power are distributed across the entire food system.

The first chapter is on 'Politics, power and potential of food'. It provides a fact-based introduction to the problem and concludes that an analysis of the title of the book requires a critical understanding of capitalism, which drives the food system.

Chapter 2 analyses the continuing hunger crisis in a 'world of plenty' food. It shows that hunger and shortage of food is not a technical 'green revolution' problem but an economic and political issue.

The extensive Chapter 3 analyses the food-environment nexus. Sections on soil, water, biodiversity, climate change, the food 'footprint', GMOs, and climate-smart agriculture advocate a transition to ecological farmers who are concerned with and act on these problems.

The concluding fourth chapter looks for an answer to the title of the book. It gives ample attention to agroecology, the social aspects of the problem. It introduces the concept of 'food sovereignty'. The chapter testifies to a strong belief in internalisation in the food price of the currently externalised aspects and of widely supported participatory projects for sustainable food. This latter aspect is what one might expect from the executive director of 'Food first, the Institute for Food and Development Policy', who is the author of this revealing book.

Overall, the answer to the question which provides the title of this book is a conditional 'yes'. The conditions are that, in the short-term, we should:

- stop deforestation
- improve productivity and resource efficiency
- change diets
- stop food waste.

This is, compared to the current situation, a completely new paradigm for thinking about food and farming.

This is an interesting, fact-based book calling for action and putting hunger and food security in a sustainable development context.

## **5 Putting the Genie Back: Solving the Climate and Energy Dilemma**

**by: David Hone**

**Published 2017**

**by Emerald Publishing**

**Howard House, Wagon Lane, Bingley BD16-1WA, UK, 253pp**

**ISBN: 978-1-78714-448-4 (print)**

**ISBN: 978-1-78714-447-7 (online)**

**ISBN: 978-1-78714-932-8 (e-pub)**

The climate change induced discussion has many stakeholders. Among them, the oil and coal industries are prominent for at least two main reasons: they have an obvious economic and business advantage with a 'business as usual' scenario, and at the same time, they have built up during the last half of a century an impressive amount of knowledge and experience of the 'new', less conventional energy sources the transition necessitates. Therefore, it is interesting knowing about the main lines of their position in the debate.

This book unravels these arguments. David Hone, the author, is Shell's chief climate change strategist. The book is based on his blogs and e-book series in which he reflects on contemporary climate change issues.

The book is actually structured in two main parts: an informative and an interpretative one. Following an introductory chapter, Chapter 2 provides an overview of the climate change basics: its origin in greenhouse gas emissions and selected main effects.

Chapter 3 and Chapter 4 provide more interpretation. The author argues that, without carbon capture technology and carbon pricing, the renewable energy revolution alone will be insufficient.

Chapter 5 is about the Paris Agreement, currently, the most influential policy instrument on the transition of the global energy system. The ambitious target is to reduce the carbon dioxide emissions rapidly from 40 billion tons per year in 2016, to near-zero by the middle of the century. The conclusion of the analysis are that the cooperative action of the national states to reduce the CO<sub>2</sub> emissions using market-based approaches might turn out as the most important aspect of the agreement. This chapter should be read together with the foreword: 'Donald Trump and the Paris Agreement'. The conclusion being that the goals of the agreement are at risk if the nations-parties do not look beyond their energy transitions.

The more revealing part of the book is in the last three chapters. 'A global relevant policy approach' echoes the need for a global carbon price and a new carbon accounting regimen. The transition should technically be engineered aiming at affordable and reliable access to sufficient electricity and energy in sectors such as aviation, which were not covered by the Kyoto Protocol. Geo-engineering might be part of the 'look beyond' option. The conclusion puts emphasis on the responsibility of the nations and the inert character of realising the energy transition.

The general message behind this book is that in spite of the sense of urgency linked with the worldwide (market conform) energy transition, the growing energy demand will necessitate a good deal of carbon-based energy generation next to risky engineering such as carbon storage.

This book is not a scientific textbook. Neither is it a collection of scientific papers. Rather, it presents a series of personal notes and biased argumentation of the position of a main oil company in the debate on climate and energy. The vocalist is a leading, excellently informed strategist, who was trained as a chemical engineer. The text is well written and complex issues are made most accessible, also for the non-expert. Part of the reason why, is that each chapter offers an accessible mix of stories, citation and facts. The bullet summaries of the main points are a surplus.

Overall, the book provides an original but biased view on the energy transition discussion. Once the reader realises this, the rationale behind the text becomes most interesting.

## **6 Wastewater and Biosolids Management**

**by: Ioannis K. Kalavrouziotis**

**Published 2017**

**by IWA Publishing**

**Alliance House, 12 Caxon Street, London, SW1H-0QS, UK, 161pp**

**ISBN: 9781780408224 (paperback)**

**ISBN: 9781780408231 (e-book)**

Wastewater management is an activity for all times. In the Greek-Roman City of Pergamon (along the nowadays west coast of Turkey), the water of the bathing facilities of the Aesculapion (the hospital of the ancient Greeks), was collected and allowed to rest and sediment before it was released in the nearby creek. Today, water is contaminated by

a much more complex set of pollutants than the likely biologically contaminated water of the Greek patients in Pergamon.

Apart from an introductory and interesting chapter on 'Wastewater management in ancient times', this book covers a wide range of current, new and emerging topics in wastewater and biosolids. Eleven chapters deal with topics varying from new technologies, over nanofiltration and energy use, to micro-plastics and synthetic fibres in wastewater and sludge.

Of particular interest is the chapter on removal of pharmaceuticals and personal care products (PPCPs) from wastewater. Research of the past 20 years showed their widespread, almost ubiquitous, presence in the environment, not only in main water bodies such as rivers and streams, but also in drinking water. Although these PPCPs are present in low concentrations (ng/l to microg/l), their sometimes mutagenic and hormone mimicking character makes them substances of concern. Aspirin should just not be present in Rhine water. The (short) chapter provides a concise overview of the technologies, their efficiencies and the operational aspects to remove these water-malign substances. The conclusions list current gaps in our knowledge and point to the potential of phytoremediation. The chapter illustrates how the book deals with the nowadays environmental pollution.

Also, the focus on reuse is worth mentioning. The chapter on pollution uptake by crops is in line with the growing reuse of wastewater for irrigation. This is driven by an increasing shortage of irrigation water in many regions of the world. The chapter discusses key physical-chemical properties of the relevant pollutants, their bioavailability, their metabolism fate in crops, the health risks, and the soil-amending strategies. The chapter concludes on the risk of exposure following accumulation and advocates more research on the resulting health effects.

Along the same reuse line is the chapter on sewage biosolids composting and soil applications. Apart from their manifest contributions to the quality of the soil, their application also needs careful impact assessment.

This book is produced in the context of the activities of the International Water Association. It offers a 'capita selecta' of nowadays important, new and emerging topics in wastewater and biosolids. Theoretical, research, practical and application aspects are dealt with. This mosaic of data provides rather an overview than an in-depth discussion. Nevertheless, the book is most useful for students, academicians, professionals, and all those interested in contemporary trends of wastewater research, with particular attention to minimising health risks and protecting environmental quality.

## **7 Natural Hazards: Explanation and Integration**

**by: Burrell E. Montz, Graham A. Tobin and Ronald R. Hagelman III**

**Published 2017**

**by Guilford Press**

**370 Seventh Avenue, Suite 1200, New York, NY 10001, USA, 445pp**

**ISBN: 978-1-4625-2917-9**

Natural hazards such as earthquakes, tsunamis, landslides or hurricanes are susceptible to media attention and fast policy responses, and when they happen, their acute aspects obtain wide coverage. This book looks into the scientific aspects of the issue. It is about

causes and consequences, about mechanisms and models, and how to deal with hazards in a scientific analytical and interpretative, critical way. All chapters are impregnated by an interdisciplinary approach combining natural with applied and social sciences disciplines. This provides the text with a most integrated and comprehensive character.

The book is structured in nine chapters. The first one provides an introduction to the overarching themes, focusing on the different dimensions of hazards and including a description of the main types of hazard worldwide. Chapter 2 considers the physical mechanisms and looks into the special and temporal aspects of the events. The approach aids in predicting, protecting against and responding to the studied phenomena. These chapters dovetailing in the natural sciences and in geography, are followed by four chapters dealing with human sciences aspects. Chapter 4 examines individual perceptions and analyses a range of components that together contribute to behaviour. Most interestingly, the chapter explores the complex link between perception and decision-making. Chapter 5 expands the behavioural components from the individual to the community level. The chapter is, among other things, about values, decision makers, experience, leadership, actors and factors in long-term community response. The chapter shows how and why a large variety exists in responses to hazards. In Chapter 6, the wider picture of policies, their instruments and responses toward natural hazards is addressed. The data show that the answer to the increased natural hazard risk is about more comprehensive planning, focusing in particular on those who are socially, economically and politically marginalised. Chapter 7 discusses the economic aspects of natural hazards. It is about the costs of immediate and long-term losses and predicting them; about costs and benefits and monetary aid following disasters. The chapter shows that also the economic impacts should be assessed from a number of perspectives. More in particular focusing too much on the direct impacts entails a major danger of underestimating the magnitude and the nature of the real disaster associated costs.

The last part of the book deals with two main instruments of hazard management: risk assessment and integrated approaches. The risk chapter is (in contrast to the previous chapters) focusing on theory, rather than on its application to natural hazards. It advocates the necessity of integrating risk analysis in policies to minimise vulnerability and create resilient communities. The concluding chapter provides an integrative framework through which natural hazards might be explained and managed. By linking the components of the eight previous chapters, it emerges as one of the strongest, timeliest and most innovative contributions of the book. The framework offers an interesting base on which hazard reduction policy recommendations can be made.

This is a most interesting, comprehensive and stimulating book. It offers a wealth of international data from a worldwide perspective (although many aspects are illustrated with cases from North America). It contributes to the understanding of how humans deal with main disasters, from their physical origin, over the behavioural and (selected) economic aspects, up to comprehensive policies. It shows once more how geography (the three authors are professors in geography) is a science discipline in an advantageous position between fundamental and human sciences.

The text is most didactically presented. It includes a wealth of clear tables and over 1,400 references. Each chapter is provided with an introduction, and a clear statement of its aims. At the end of most chapters, a 'Conclusion and integration' section not only links the elements provided in the chapter, but also outlines links with the previous chapters. This makes the book most useful as a support for graduate courses on hazards in



geography and human ecology. The book is equally of interest to policy makers and advisers on the subject, consultants and those of us involved in international aid.

The second edition of this book offers a synthetic, updated, and integrated text of one of the important contemporary human ecological issues.