
Book Reviews

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1 Sustainability Assessment of Renewables-Based Products: Methods and Case Studies

by: Jo Dewulf, Steven De Meester, Rodrigo A.F. Alvarenga

Published 2016

by John Wiley & Sons, Ltd.,

The Atrium, Southern Gate, Chichester,

West Sussex, PO19 8SQ, UK, 400pp

ISBN: 9781118933947

Since the publication of *Our Common Future* (WCED, 1987), enormous progress has been made in measuring sustainability. The original models and their related indicators have been complemented with more detailed and sophisticated methods addressing a wide range of sustainability aspects.

This book illustrates and dissects life-cycle analysis as one of the most successful methods in this realm and focuses on renewables-based products. The book is organised in four sections. The first one describes the evolution and roles that renewables have taken. It entails five chapters providing the theoretical background to the assessment of renewables-based products and services. It discusses the need for a comprehensive method integrating environmental, social and economic aspects, over the complexity and multi-faceted aspects of the production and consumption chains. The result is integration in a broad interpretation framework of sustainability, combining, e.g., risks, environmental health, safety, market, feed stock supply, etc. (the four pillar method). The section also sets the scope of the book: a strong focus on energy, but also ample attention for materials, water, applications in business and industrial land, food and waste. It deals with fundamental aspects of environmental services.

The second section advocates taking sustainability principles on board in designing new technologies such as renewables-based ones. It entails interesting chapters on solar, geothermal, biofuels and succinic acid.

The last two sections present a selection of sustainability methods applied to case studies such as sugar cane, poly (vinyl chloride) and packaging materials.

This book is most interesting as it deals with different dimensions of the renewables-based discussion:

- The theory on the growing role of biomass and renewable energy and measuring sustainability.
- The practice with life-cycle assessment (LCA) and footprints.
- The applications on energy and a wide array of other aspects (water, air, soil) of most importance for a sustainable society.
- The policy implications of the growing sustainability assessment toolbox.

Although the book pays ample attention to the limitations of life-cycle (sustainability) assessment, it is driven by a most positive view on the contribution of (interdisciplinary) science and technology, while negative aspects are under-lightened: for example, the reader will not find a critical assessment of the environmental impacts of PVC. Moreover, the text searches for the beneficial impacts of renewables-based products and services, rather than threats, concerns or constraints, which are often emerging as a result of LCA. On the other hand, the text is structured according to scientific principles: not only the opportunities but also the limitations of the approach are addressed. Among these latter, the main challenge is to implement sustainability assessment in policy making.

This is a systematically structured book presented in a clever format from the introduction to the conclusions. All 24 chapters are functionally illustrated with figures and tables.

The book is edited by two experts of Ghent University (Belgium), and by Dr. Avarenga who works at the University of Santa Catharina (Brazil). The chapters are contributed by an international group of 81 authors, which indicates the wide scope of the book and the complexity of the editorial work.

In conclusion, this book offers an up-to-date and updated summary of the theory and practice behind renewables-based products and the relevant sustainability assessment methods.

References

World Commission on Environment and Development (WCED) (1987) *Our Common Future*, Oxford University Press, UK.

2 **Modern Poisons: A Brief Introduction to Contemporary Toxicology**

by: Alan S. Kolok

Published 2016

by Island Press,

2000 M Street NW, Suite 650, Washington, DC 20036, USA, 208pp

ISBN: 13: 978-1-61091-382-9

ISBN: 10: 1-61091-382-5

Environmental toxicology, as an essential part of environmental health, gradually but deliberately differentiates from classical toxicology. Whereas this latter topic has strong historical, pharmaceutical, and medical ties (the study of merely acute effects of natural or manmade poisons and medicines of which acute, direct, sometimes lethal effects matter), environmental toxicology focuses on the changing nature of society's interaction with chemicals: pollution, health effects of long-lasting exposure to low doses and complex mixtures, the human environmental health nexus to list just these differentiating aspects.

This book provides a response of toxicological science to the changing questions of post-modern societies: what are the effects of the global, intense, diverse and fast spread of chemicals and their mixtures? What are the effects of subtle yet enduring toxic

responses? How does toxicology respond to the newfound complexity of exposure to contaminants in air, water, soil, and food?

The book is structured in two main parts. The first six chapters are about selected fundamentals: the 'dose matters' edict of Paracelsus, which still explains interactions between the molecule and the organism; the basic characteristics of molecules that matter in (environmental) toxicology; the varied ways a (human) organism and its organs deals with the chemicals; and the defence mechanisms of the body.

The second part has 14 chapters discussing the main groups of pollutants. Both classical environmental contaminants and substances of more recent concern are addressed. Among the first group are chapters on particulates, (heavy) metals and other ions, products of combustion, and pesticides. 'Novel substances of concern' covers toxic toiletries, among which are personal care products (PCPs) and (para-)pharmaceuticals, products with endocrine-altering activity and their impact on sex regulation, and products crossing into the placenta, causing multigenerational effects. Of particular interest is chapter 20, discussing how pollutants such as pesticides, antibiotics, and bacterial plasmids might cause chemical resistance that affects natural selection mechanisms.

This book explains this complexity without any table or figure. The reflective character of the book is also illustrated by the structure of each chapter. They all start with a citation from the world literature (from Paracelsus, over Kafka, to Newton), followed by a personal introduction often dovetailing in the experience of the author, before starting to explain the chemical and biological concepts underpinning the book. This option results in an accessible and up-to-date text, documented with multiple cases and avoiding unnecessary scientific jargon. Therefore, this text is an interesting wrap up for students and researchers and also for interested 'laymen'. As a professor and head of the Centre for Environmental Health and Toxicology at the University of Nebraska Medical Centre, the author, Alan Kolok, is clearly familiar with and experienced in the scientific social context of the problems addressed in this book. He swiftly links toxicological history, basic mechanisms, cases and environmental contexts to an interesting multi-disciplinary text, which is intermediate between traditional textbooks and popular science.

A motivating, documenting and explicative introduction to a wide range of contemporary aspects in environmental toxicology.

3 Critical Role of Animal Science Research in Food Security and Sustainability

by: Committee on Considerations for the Future of Animal Science Research, National Research Council

Published 2015

by The National Academy of Sciences,

Washington, DC 20001, USA, 411pp

ISBN: 978-0-309-31644-6I

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Food security, both locally (adapting to drought, changing crops), and globally (feeding 10 billion people by 2050 in particular with animal products), in one of the main challenges today. This book is about the vision of a US committee on considerations for

the future on animal science research in this food security context. It asks how and to what extent animal proteins will constitute our diet in the future.

Chapter 1 provides an introduction and describes the challenges faced by the animal agriculture enterprise in the US with an outlook to 2050. It puts the discussion in a sustainability context dealing with demography, environmental (climate, habitats), social (consumers, health) economic, and policy aspects. The second chapter is about the 'Global food security challenge' and deals with the animal-human health nexus, the opportunities of genetic engineering, and ethical aspects of the discussion. Chapter 3 is about research needs in animal agriculture: it concludes with 14 recommendations that are relevant not only for the US, but for the entire (industrialised) world.

Chapter 4 analyses global considerations for animal agriculture research. It discusses the impact of essential environmental issues (water security, global changes, food, waste) on research. Chapter 5 addresses capacity building and infrastructure for research and research transfer in food security and animal sciences. The chapter is based on data from 128 US universities offering animal science programs. Data on funding research, education and partnerships are provided. The concluding chapter entails recommendations on the wide scope of subjects reviewed by the Committee. They range from breeding and genetic engineering technologies, through nutrition and animal health, to communication and socioeconomic considerations.

Nine annexes, a glossary, short biographies of the committee members, and the task statement of this National Research Council group constitute the last part of the publication.

Each chapter is most logically (if not classically – introduction, core part, conclusion) structured and provides an extended reference list. Boxes on particulate subjects (insect proteins, animal welfare, salmon and shrimp aquaculture, etc.) illustrate the guiding discussions.

This peer-reviewed publication is most useful material not only for technicians and animal science researchers, but also for all of us interested in and contributing to the food-sustainability nexus discussion.

4 Sustainability: How the Cosmetics Industry is Greening Up

by: Amarjit Sohota

Published 2014

by John Wiley & Sons Ltd.,

The Atrium Southern Gate, Chichester, West Sussex,

PO19 8SQ, UK, 333pp

ISBN: 978-1-119-94554-3

The cosmetics industry increasingly faces environmental controversies. Significant amounts of organic solvents are used among others in nail care; parabens which are used in thousands of cosmetic products from shampoos to baby products are the most widespread endocrine disrupters in Europe's river soils; red and orange pigments used in tattoos are often mutagenic and of a suspicious quality. The sector faces ethical problems, scarifying huge numbers of animals in avoidable tests. As part of the (fine) chemicals

industry it is loaded with a negative environmental public perception in general. The notion that these issues are manageable and can be avoided has become of increasing importance also within the sector. Mainly environmental, social, economic, and ethical aspects become integrated under the sustainability head. This offers the analytical framework for this book.

Following two introductory chapters on sustainability and the environmental aspects of cosmetics, the chapters deal with social impacts, ethics, biodiversity, packaging, energy and waste management. Chapter 2 on the 'Environmental impacts of cosmetic products' is most interesting as it overcomes the analytical description of the issues. Addressing their corporate carbon footprint aspect, the chapter puts the discussion in a context of eco-design and eco-labelling. The chapter is illustrated with a case study discussing how L'Oréal deals with these aspects. The overall structure of this chapter illustrates the way the other chapters in this analytical-descriptive section are built up (theoretical aspects are illustrated by case studies and field practices).

The last chapters in the book deal with instruments for sustainability management: corporate social responsibility (CSR), green chemistry, green standards, certification and indexes, marketing of green products, and understanding green consumers. Of particular interest is chapter 10, which provides an update on green standards, certification scenes, indicators and indexes. Details are given of natural organic and fair trade standards, and of sustainability and corporate responsibility indexes. The lists of natural products, fair trade, and other eco-labels for cosmetic products is at the same time impressive, confusing, and difficult to understand for the consumer.

The concluding chapter 14 summarises the key findings of this book and provides growth projections. What are the shortcomings in the cosmetics sustainability industry and what can be expected in the future? The way forward appears to be companies handling strong environmental social and ethical values.

This is an interesting and brave book. Interesting because many less known subjects of the (mainly European) cosmetic industry are uncovered. Brave because the book shows, both in theory and in practice, how sustainability can be, and is, approached in this sector of luxury products, with plenty of ideas and means guaranteeing a more sustainable future. In this sense the book offers an attractive template for related luxury sectors such as clothing and jewellery. Although many theoretical aspects are covered, this is not a scientific publication: research aspects are marginally covered (the call for more research is well noticed), education and training elements are not discussed, and consumption and marketing aspects dominate the chapters. Although the case studies are interesting and provide added value, they have a veneer of commercialism and biased looking at the bright side of the situation. Most of the authors are active in the cosmetics industry and the Cosmetics Europe association, an umbrella organisation for main and SME companies in the sector, patrons the publication.

Nevertheless, this is a book of interest to all of us (in the cosmetics and personal care industry, chemists, formulation scientists, policy makers and advisors, business and marketing executives) looking for examples and opportunities driving particular sectors, as in this case the cosmetics industry towards more sustainability. A valuable, although driven by one target group, addition to the, often most theoretical, sustainability literature.

5 The Social Domain in CSR and Sustainability: A Critical Study of Social Responsibility Among Governments, Local Communities and Corporations

by: Monica Thiel

Published 2015

by Gower Publishing Limited,

Wey Court East, Union Road, Farnham, Surrey GU9 7PT, UK, 153pp

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ISBN: 9781472456380 (ebk – ePDF)

ISBN: 9781472456397 (ebk – ePUB)

Corporate social responsibility (CSR) is one of replies of the business, industry and services sectors to the call for sustainable development. The concept widens the economic and organisational responsibilities of post-modern organisations with environmental, social and ethical aspects. While the environmental aspects of this scope are rather well defined and differentiated by sector, this is much less the case for the social and ethical aspects.

This book is about identifying and managing social responsibility in CSR. It addresses a wide set of issues ranging from empowering organisations with a better understanding of social responsibility, over stakeholders in advanced economies, to a description of the scope and challenges of CSR.

Next to an introduction on the current dimensions of the social domain in CSR, the book is structured in five chapters. The first one discusses how society drives social responsibility of CSR. The discussion is about beliefs, trusts, competitiveness, expectations and the knowledge gaps on these subjects.

Chapter 2 dissects the social domain in six constituents: social-economics, welfare and well-being, stakeholders, unequal responsibilities, social progress and societal competitiveness. The analysis provides an analytical framework for research.

Chapter 3 is about human bias and fragmentation in social responsibility. It analyses further its constituents in seven practical CSR and sustainability challenges, including reporting tools, the role of individuals, and discipline fragmentation.

Chapter 4 discusses how governments, corporations and local communities impact each other in CSR and sustainability. A social responsibility model has a central place in this chapter.

Chapter 5 describes recommendations for corporations and governments. Examples of CSR strategies in eight companies are described. They show that fragmentation of knowledge is an important risk indicator. Other recommendations concern the CSR strategy focus on social aspects, the opportunities and limitations of the transdisciplinary approach in CSR, and the mind-set of the stakeholders. The recommendations have a significant potential for influencing CSR approaches in practice.

The book shows features proving it a unique place in the literature:

- **Subject:** On the area of the social-CSR interface relatively few publications exist. This book summarises this literature and adds original research by the author.
- **Content:** Results of original research are a landmark in each of the chapters. This provides inspiration for establishing and proliferating research on this subject.

- **Scope:** While a traditional way of completing the social aspect of CSR involves respect for human rights, labour conditions and community involvement, this book provides a new and wider scope to the issue. It analyses and dissects the social CSR component in a set of aspects that are often absent in practical company approaches to CSR. It opens previously barely researched social aspects of CSR as transdisciplinary. The book provides inspiration and contributes to understanding on how to implement CSR strategies.

Altogether, this book will appeal not only to students and researchers, but also to practitioners in business, government, environmental and consumer NGOs, and the fast growing number of assessment panels in banks and abroad advising on CSR investments.

The book is a most valuable addition to the scientific CSR literature and an excellent contribution to the Gower CSR series.

6 Vital signs: The Trends that are Shaping Our Future

by: The Worldwatch Institute,

Published 2015

by Worldwatch Institute,

1400 16th Street, N.W., Suite 430,

Washington DC 20036, USA, 136pp

ISBN: 13: 978-1-61091-672-1

The most recent 'environmental state of the world' has been published. Six sections deal with main worldwide trends charactering environmental quality.

Particular attention is given to energy and climate change. Global energy trends show that coal consumption keeps rising (up to almost 4 billion tons of oil equivalents in 2013). The same trend applies to the export figures of the world's most important coal exporters. By contrast, renewable energy continues to expand rapidly. Wind power capacity increased by a factor of six between 2004 (less than 50 GW) and 2013 (over 300 GW of total installed capacity). Solar capacity increased by a factor 10 during the same period (up to 140 GW in 2013). As a result, the nuclear share of global power production declined (from 18% during the peak year 2000 to 11% in 2013). Investments in smart grids and smart meters increase and improve the operation and reliability of electricity transmission and distribution systems. The increasing share of shale gas in the total natural gas production in the USA, Canada and China is suspicious from a sustainability point of view.

Nevertheless, the global picture indicates that CO₂ increased to 36.1 billion tons in 2013, which is a 61% increase on 1990 levels. In terms of effects, coastal populations are most vulnerable as sea levels continue to rise. In countries such as Vietnam and Bangladesh, respectively 55% and 46% of the population live in low-elevation coastal zones.

Car production continues to increase. Light vehicle production reached an absolute record of 70 million cars in 2013.

On the food front, wild fish capture stabilised at a high level (about 100 million tons per year during 2004–2013), while aquaculture continued to gain (in particular in China).

Global meat production (half of it is bovine meat) increased to an estimated 308 million tons in 2013, a growth of 1.4% over 2012. This trend is increasing the pressure on water, feed grains, antibiotics use, and grazing land. Also, coffee, cotton and genetically modified crops show worrying trends.

Paper use offers most important saving opportunities, as plastics do. Nevertheless, recovery and recycling of plastics remains minimal in most countries, while millions of tons end up in landfills and oceans each year.

The last section is about demographic trends. Pointing to uncertainties in medium- and long-term forecasts on the evolution of populations, the chapter asks the question 'Will population growth end in this world?' (the 7.3 billion of today are expected to increase at least until 2070; after 2070 different projections provide different outcomes).

The descriptive analysis ends by pointing to the decreasing proportion of people experiencing chronic hunger (although one in nine are still affected).

As pointed out in the introduction by Worldwatch Institute project director Michael Renner, one hardly might underestimate the importance of consumption (and production) as drivers of these global trends. Consumers often do not know about the full footprint of coffee, a T-shirt, a steak, or (unnecessary) packaging material. They are unaware about the environmental impacts and about the limited capacity of the current managerial options (saving capacity, assessment methods, labels, eco-taxes, substitution) to alleviate the problems.

As during previous years, this report remains an essential element in appreciating 'The vital signs' of the environmental services in this world. A global vision, reliable data, and sense for mixed trends remain the care characteristics of the experts of the Worldwatch Institute contributing to this 'must see' book by all of us in environmental sciences, policy and awareness raising.