

CLIMATE CHANGE:

From Science to Sustainability

Stephen Peake and Joe Smith

Oxford; New York: Oxford University Press, Second Edition, 2009, 291 pp.
paper, ISBN: 978-0-19-956832-1

Reviewed by Norman K. Jones

Department of Environmental Studies and Geography, Bishop's University,
Sherbrooke, QC

This book is written partly to support the Open University course *The environmental web*, however it could be used as a text for any related environmental change course. Given its stated purpose is the education of undergraduates, the language used is fairly general; advanced concepts and terminology are supported by numerous Figures, Text boxes, Activities and Tables. Each of the seven Chapters is followed by a series of Questions to reinforce the preceding concepts, and a list of References for further reading.

The seven book chapters are arranged in a logical sequence beginning with two chapters providing overviews of the science behind climate change. A general definition of climate change is provided and then Chapter 1 focuses on the role played by the greenhouse effect, particularly what the authors refer to as the enhanced greenhouse effect. A reasonably thorough, straightforward explanation of the greenhouse effect and especially the roles played by water vapour and carbon dioxide is provided. The human role in 'enhancing' the greenhouse effect through the emission of greenhouse gases is made clear. In fact, throughout the chapter the underlying theme is one of how important an environmental issue climate change is, and what a threat it is to humanity. There is also a relatively constant theme of human blame. The authors carefully select quotes from scientists, politicians and media representatives to support this theme. In other words, underlying the scientific message is an even stronger political one. This is not to say that the scientific basis for climate change is not explained well, it is. However, the authors clearly want to emphasize the relationship between the science and the politics of change.

Chapter 2 is thematically similar to Chapter 1. A basic explanation of how the Earth's climate operates and how it is changing is presented in simple, straightforward language. Basic concepts, such as the energy balance and global patterns of air movement, are discussed and displayed in clear, easy to understand Figures. Similarly, Earth's evolution from its origins to the present and the progression of past climate change are discussed in basic terms. The slow cooling that took place during the Cenozoic Era is covered and the cyclical pattern of Earth's climate over the past 800,000 years, with long glacial periods alternating with short interglacial periods, is well described. Like in Chapter 1, the carbon cycle and the importance of carbon dioxide as a greenhouse gas play a key role in this Chapter. And, once again, the role of humans in enhancing this effect, principally through the release of increasing amounts of CO₂, is emphasized. The political message in text, Boxes and Activities is made clear: humans are responsible for climate

change, at least in very recent times. The title of one chapter sub-section “Is climate changing and are humans the cause?” could easily be re-written as “The climate is changing and we are the cause”. The authors make it clear in the rest of the Chapter that they are not really interested in climate change in the geologic past, the focus here is on very recent climate change and the important role people are having in creating it. Various examples of the projected impacts of human-induced climate change, ranging from increased storm intensity to ecosystem damage to food insecurity are used to illustrate the detrimental role people are having on their changing environment.

Chapter 3 provides an overview of how people are responding to climate change. The creation of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 is outlined and is regarded as a centerpiece of the global political response to climate change. Even with the establishment of this Convention it is made clear that political uncertainty will greatly limit its effectiveness. The same point is made of the adoption of the Kyoto Protocol in 1997. The authors recognize the limited impact this Protocol will have. Both the Convention and the Protocol are seen as having more political significance than potential for reducing the human impact on climate change.

The title of Chapter 4, *Future climate scenarios*, is based on the scenario analysis used by the Intergovernmental Panel on Climate Change (IPCC). The focus here is on how people may respond to the economic and environmental impacts of climate change. The four families of scenarios used by the IPCC are well explained, with cartoon-like Figures used to further illustrate the similarities and differences between them. An integrated approach to understanding climate change would involve taking into account the costs of either business as usual, adaptation or mitigation. It is noted that all three options have costs and benefits. Simple quantitative models are used to illustrate the uncertainties surrounding projections of future change and the role played by people in any change. Population, income and technological change are seen as the driving forces in the human involvement in environmental change. Finally, the Chapter outlines how co-operation between developing and developed countries will be critical for any substantive action on the human influence on future climate change.

In Chapter 5 the authors concentrate on the role that ethics plays in the climate change issue. They state that questions of equity, vulnerability and responsibility, across both time and space, are key to understanding how humans will respond to changes in their environment. They point the finger of blame squarely at the expensive lifestyles and high consumption patterns present in developed nations as the main culprits in global world problems, and suggest the Gaia hypothesis conceived by James Lovelock is a possible alternative viewpoint, helping to lead the world on a more sustainable path. The cooperative political approach suggested by political philosopher Mary Midgley and based on the Gaia hypothesis is seen as one possible solution. In the end, a balancing of economic and Gaian approaches is deemed appropriate, indeed necessary.

The concept of sustainable development, a key concept in the book, is introduced in Chapter 6. Climate change affects the entire physical global environment, rather than causing geographically distinct environmental damage, and is therefore seen as a more complex problem than people have previously faced. The concept of sustainable development may serve as a political compromise between development and environmental concerns. The authors suggest that

well-known indicators of socioeconomic health, such as Gross Domestic Product (GDP), be replaced by an indicator that includes 'ecological footprinting', the inclusion of the state of the physical environment in any analysis of political, economic and environmental life. However, it is acknowledged that any attempt to make such a change is not likely to happen anytime soon.

In the final chapter the authors attempt to bring together two major concepts previously covered in the book, sustainability and climate change, and join them with a new one, globalisation. Globalisation can be identified as economic: the flow of goods and services; political: the flow of ideas and ideologies; social/cultural: the flow of social practices and cultural products; and ecological: the movement of species. In their opinion, a key issue is our global dependence on fossil fuels. This dependence must end and people must learn to adapt to a new future where societies are environmentally adaptable and sustainable. In order to achieve this goal, and many others associated with future climate change, new forms of governance are necessary. They argue for better linkages between the social and economic systems and the natural world. Societies must find ways to be more environmentally sustainable and develop what the authors term 'ecological citizenship'. Increased communication and debate on future climate change is of extreme importance, and the media must play a central role.

Climate Change: from science to sustainability has one central message: climate change may be a natural process but recent change has been principally caused by human action. The authors are concerned with how people are causing dramatic, perhaps unstoppable, changes to our climate system and our world as a whole. Embracing the concept of sustainable development is seen as a way to, if not stop, at least reduce the impact people are having on future change. The book would be suitable for an upper-level secondary school or introductory-level college course.