

Preface

This book is a concise record of an international conference: *Climate Change, Resource-Energy Use and Sustainability of the Earth and Human Society—Having Experienced the Disasters Caused by the Great East Japan Earthquake*. The conference was held at Nagoya University on February 29, 2012, one year after the devastation caused by the Great East Japan Earthquake and subsequent nuclear power plant accident, and at a time when people in Japan were very concerned about how to secure energy sources. The conference raised a fundamental question of what viewpoint on climate change issues human society and global community should have, and was aimed at presenting a general road map to solve the issues, rather than trying to seek direct solutions. The conference brought together world-renowned researchers and was hosted by *Nagoya University Global Center of Excellence* (GCOE) Program “From Earth System Science to Basic and Clinical Environmental Studies” and *Chunichi Shimbun*, a daily newspaper publisher. This book is basically an English translation of the Japanese version published by Akashi-shoten in March 2013.

Part I of this book is a collection of presentations delivered by four scholars. The presenter of Chap. 1 is Dr. Syukuro Manabe, a senior scientist at Princeton University. He pioneered the use of computers to simulate and study global climate change and natural climate variation, and was one of the first to be inducted into The Earth Hall of Fame Kyoto along with Dr. Brundtland and Dr. Maathai. He has studied the basic principle of global water circulation and discovered that CO₂, emitted through human economic activities, induces global warming and causes droughts, heavy rains, and floods. To overcome the problem, he explains the importance of collaboration among various academic disciplines which are involved in processes ranging from diagnosis to treatment of the problem.

The presenter of Chap. 2 is Dr. Ernst Ulrich von Weizsäcker, Co-President of the Club of Rome. In the 1992 report of the Club of Rome, *The First Global Revolution*, he proposed the Factor Four concept to double wealth while halving consumption of resources. He has been a world leader not only in academic research on sustainability but also in its politics and philosophy. He explains that an

increase in resource efficiency is required in the manufacture of individual industrial products, and further proposed the Factor Five concept, which features the redesign of whole technological and socioeconomic systems such as transportation systems, tax systems, etc. He argues that fundamental to our well-being is not just efficiency based on market fundamentalism in which only the stronger can survive, but human sufficiency.

The presenter of Chap. 3 is Dr. Hans-Peter Dürr,¹ Director emeritus at the Max Planck Institute for Physics and Astrophysics. He worked with Dr. Heisenberg to study unified field theory and the uncertainty principle, and was a successor to Dr. Heisenberg in nuclear physics. He was also a philosopher who compiled the Potsdam Manifesto 2005, a follow-up to the Russell-Einstein Manifesto of 1955. In Chap. 3 of this book, he explains how the Earth has stored underground resources with the benefit of solar energy, and how humans have made critical mistakes which lead to destabilization of the Earth's system since they, who once co-existed with animals and plants, started using fossil fuels in the Industrial Revolution, and later obtained nuclear energy.

The presenter of Chap. 4 is Mr. Shohei Yonemoto. He is a historian of science as well as a philosopher. He explains how global warming became a political issue after the end of the Cold War, and that the issue is a rare case in which preventative measures have been taken based on scientific knowledge. In addition, he discusses the role Japan should play in this issue, raises Malthusian questions regarding food and population, and argues for the necessity of conversion to a new science called futurology which also takes account of factors such as adverse effects of global warming, international cooperation among Asian and other nations, and threats of natural disasters like earthquakes and tsunami.

Each chapter includes an interview with the presenter entitled "Eco-Lab Talk," which first appeared in Japanese in a series of *Kwan*, a magazine of the Graduate School of Environmental Studies, Nagoya University in Japanese.

Part II of this book relates to a panel discussion which followed these presentations. Mr. Ayumu Iio, an editorial writer for the *Chunichi Shimbun*, and I, acted as moderators, and the following topics were discussed:

- (1) Japan, which suffered the Great East Japan Earthquake, is in a position to propagate the idea that huge earthquakes induced by the distortion of the Earth's crust are a threat from Nature, in the same way as climate change caused by CO₂ accumulation in the atmosphere.
- (2) We should look for a cascade method of energy usage to sustain civilization and bring happiness to people.
- (3) We should rely on solar energy. We should stop relying on unsustainable fossil fuels and nuclear energy: using such energy sources is stealing Earth's resources and making profits by stealing.

¹Dr. Hans-Peter Dürr passed away on 18 May 2014 at the age of 84 when we were editing this volume.

- (4) We should reproduce Japan's success stories in the way that the country once increased energy efficiency and gained the leading edge under the influence of its wonderful culture.
- (5) Complete disposal of nuclear waste, requiring a huge energy commitment, is ultimately the only method and it is currently unachievable economically.

The conference's goal was to develop road maps for the creation of a cycle in which our generation, as well as our future generations, can live happily. To achieve this, many ideas were shared, suggesting that humankind should not plunder natural resources from the Earth, but should rather conserve Earth's resources and learn to live with other living creatures by developing technology, raising people's awareness, and restructuring our social, economic, and political systems.

This description may have made the book sound a little arcane, but each chapter is easy to read, with detailed and clear descriptions. I hope that the book's great insights will get across to readers, and be of help in steering Japan and the rest of the world, as well as the planet's biosystem, towards more sustainable society and systems.

I would like to thank the members of the university's GCOE program who organized the conference, and Dr. Masayuki Fukumoto, a member of my research group who gave up a lot of his time and offered his advice to edit this book. I must not forget to mention Mr. Paul Mason and Mr. Kenji Sasaki of SIA Inc. for their excellent translation. To host and organize the conference as well as to publish this book, we were financially supported by the Global COE program of the *Ministry of Education, Culture, Sports, Science and Technology*. The *Chunichi Shimbun* offered us its help in organizing the conference. I would like to extend my gratitude to each of these individuals and organizations.

Nagoya, Japan
September 2015

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Climate Change, Energy Use, and Sustainability
Diagnosis and Prescription after the Great East Japan
Earthquake

HAYASHI, Y.; Yasunari, T.; Kanzawa, H.; Kato, H. (Eds.)
2016, XI, 115 p. 72 illus., 59 illus. in color., Softcover
ISBN: 978-3-319-40589-6