

# Translational Systems Sciences

## Volume 7

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In 1956, Kenneth Boulding explained the concept of General Systems Theory as a *skeleton of science*. He describes that it hopes to develop something like a “spectrum” of theories—a system of systems which may perform the function of a “gestalt” in theoretical construction. Such “gestalts” in special fields have been of great value in directing research towards the gaps which they reveal.

There were, at that time, other important conceptual frameworks and theories, such as cybernetics. Additional theories and applications developed later, including synergetics, cognitive science, complex adaptive systems, and many others. Some focused on principles within specific domains of knowledge and others crossed areas of knowledge and practice, along the spectrum described by Boulding.

Also in 1956, the Society for General Systems Research (now the International Society for the Systems Sciences) was founded. One of the concerns of the founders, even then, was the state of the human condition, and what science could do about it.

The present Translational Systems Sciences book series aims at cultivating a new frontier of systems sciences for contributing to the need for practical applications that benefit people.

The concept of translational research originally comes from medical science for enhancing human health and well-being. Translational medical research is often labeled as “Bench to Bedside.” It places emphasis on translating the findings in basic research (at bench) more quickly and efficiently into medical practice (at bedside). At the same time, needs and demands from practice drive the development of new and innovative ideas and concepts. In this tightly coupled process it is essential to remove barriers to multi-disciplinary collaboration.

The present series attempts to bridge and integrate basic research founded in systems concepts, logic, theories and models with systems practices and methodologies, into a process of systems research. Since both bench and bedside involve diverse stakeholder groups, including researchers, practitioners and users, translational systems science works to create common platforms for language to activate the “bench to bedside” cycle.

In order to create a resilient and sustainable society in the twenty-first century, we unquestionably need open social innovation through which we create new social values, and realize them in society by connecting diverse ideas and developing new solutions. We assume three types of social values, namely: (1) values relevant to social infrastructure such as safety, security, and amenity; (2) values created by innovation in business, economics, and management practices; and, (3) values necessary for community sustainability brought about by conflict resolution and consensus building.

The series will first approach these social values from a systems science perspective by drawing on a range of disciplines in trans-disciplinary and cross-cultural ways. They may include social systems theory, sociology, business administration, management information science, organization science, computational mathematical organization theory, economics, evolutionary economics, international political science, jurisprudence, policy science, socio-information studies, cognitive science, artificial intelligence, complex adaptive systems theory, philosophy of science, and other related disciplines. In addition, this series will promote translational systems science as a means of scientific research that facilitates the translation of findings from basic science to practical applications, and vice versa.

We believe that this book series should advance a new frontier in systems sciences by presenting theoretical and conceptual frameworks, as well as theories for design and application, for twenty-first-century socioeconomic systems in a translational and trans-disciplinary context.

More information about this series at <http://www.springer.com/series/11213>

Shigeo Atsuji

# Unsafety

Disaster Management, Organizational  
Accidents, and Crisis Sciences for  
Sustainability

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## Preface: Unsafe Eden

Today, the conditions foreseen by Lester Brown, Jared Diamond, James Reason, and Michael Sandel are beginning to become a reality and manifest themselves in the immediate social environment and at a national and global level. Starting out from densely populated countries and spreading in all directions across national boundaries, the exploding ten billion population of the earth—Terra—(United Nations estimated figure for 2050) is progressively depleting food and water and energy resources for agriculture and industry. Humankind, like a huge swarm of locusts, is devouring resources and driving the whole Gaia system into a state of apoptosis.

Everywhere in contemporary society, the collapse, not only of weakened physical structures such as bridges, roads, and buildings but also of social systems such as pensions, nursing care, and health and social insurance, has drawn innocent people into unforeseen accident and disaster situations, causing great misery. This book presents examples of combinations of these human-made and natural disasters that developed into catastrophes. The book asks the readers what we need to do now to preserve Eden for our descendants, right down to the seventh generation. Appealing from Japan, a land of natural disaster in the Far East, I want people all over the world to think over this message of life and death.

Natural and human-made disasters happen worldwide and cause misery through loss of life; destruction of agriculture, fisheries, and other sources of livelihood; and interruption of urban life. Unsafey from a disaster in one place increases uncertainty elsewhere. Disaster can lead to famine, increased international tensions, refugee flows, and even war or revolution. In recent years, natural disasters have occurred frequently across the globe, while human-made organizational accidents have also followed an inexorable trend toward increase in scale, presenting urgent issues in all nations for individuals, organizations, regions, states, and the globe.

Unsafey focuses on the kinds of unnatural disaster and organizational accident which arise as repercussions of natural hazards, for example, in the author's native Japan, where earthquakes, tsunamis, and typhoons are common, with the Fukushima nuclear disaster as an outstanding example of this link between natural disaster and

organizational accident. The author explain that one factor in the Fukushima catastrophe, which followed in the wake of the earthquake and tsunami, was the latent deterioration and aging of systems at all levels from the physical to the social, leading through chain reaction to unsought and unforeseen consequences. Here, the aging of the nuclear reactor system, the breakdown of safety management, and inappropriate instructions from the regulatory authorities combined to create a threefold disaster, in which technological, organizational, and governmental dysfunction have been diagnosed as reflecting a systems pathology infecting all levels.

This book examines accidents and disasters in the modern era and clarifies the mechanisms involved and the significance of emerging problems, from the aging of vital infrastructures for the supply of water, gas, and electricity to the breakdown of pensions, healthcare, and other social systems, demonstrating how we might check the underlying pathology and threat of systemic breakdown and exploring potential management systems approaches and policies bearing both on causes and effects.

The International Society for the Systems Sciences was founded by Ludwig von Bertalanffy and is associated with names such as Anatol Rapoport, Ross Ashby, Kenneth Boulding, Peter B. Checkland, Hal Linstone, Stafford Beer, Russell L. Ackoff, J.G. Miller, Ervin Laszlo, Howard T. Odum, and Ilya Prigogine. At its millennium world congress (2000), I was in immediate attendance at lectures by Humberto Maturana on ‘autopoiesis’ and Eric Chaisson on ‘cosmic evolution’, which left a great impression on me. Behind that emotion was a shared academic hinterland of classic works such as N. Wiener’s *Cybernetics*, C.I. Barnard’s *The Functions of the Executive*, H.A. Simon’s *Administrative Behavior*, and the work of P.F. Drucker, R.L. Carson, T. Colborn, L. Silber, Kitarō Nishida, Wang Yangming, and Tetsurō Watsuji.

Especially, I appreciate their exploration of our future possibilities and am always inspired by the intelligent work of other academics, among them Lester R. Brown (Environmental Issues: Earth Policy Institute), Jared M. Diamond (Civilization Collapse: University of California), James T. Reason (Organizational Accidents: University of Manchester), Michael J. Sandel (Philosophy: Harvard University), Simon Bennett (Disaster Management: University of Leicester), Michael Morley who is the president of IFSAM (Human Resource Management: University of Limerick, Ireland), and my mentor Prof. Gerhard Chroust (Human-Made Disaster: Johannes Kepler University Linz, Austria). It was the inspiration from their work that led me to write the book, in which I quote from their important texts. I am grateful to their intellectual contributions for the rich inspiration and insight which they have given me.

## Acknowledgments

In publishing this book, I wish to extend my heartfelt thanks for the valuable advice I received from Prof. Gerhard Chroust (Austria), Prof. Jennifer Wilby (United Kingdom), and Prof. Len Troncale (United States) while making presentations

and giving some papers at the World Conference of the International Society for the Systems Sciences in the United Kingdom (2011), Vietnam (2013), and Berlin (2015), which were valuable study opportunities. Also, at the world congress of the International Federation of Scholarly Associations of Management in Berlin (2006) and Paris (2010) and when making a speech at its world congress in Ireland (2012) and Tokyo (2014), I was inspired by Prof. Michael Morley (Ireland) who is the president of IFSAM. Also, my colleague is Dr. Peiran Su of West Scotland University. In Japan, I am grateful for the encouragement of Prof. Shinichi Oota (Doshisha University), and Prof. Koichiro Hioki (Kyoto University). Grateful thanks also for the following endorsements:

The book paints a distressing and eye-opening picture of the vicious conspiracy between large industry, governments and individual greed, sacrificing morality and sustainability for efficiency and profit. The compounding effect of human misjudgment, inadequate management, reckless face-saving and cheating, turns natural and human-caused disasters into multi-level catastrophes. Data, diagrams and maps of Japanese and world-wide catastrophes (Fukushima, etc.) support the statements. (Prof. Dr. Gerhard Chroust, Johannes Kepler University of Linz, Austria)

While the genesis of Shigeo Atsuji's inspiration for *Unsafety* may lie in his personal encounters with disaster, his analysis points to the underlying threat of a more fundamental systemic breakdown arising from the unintended consequences of our contemporary designs for living. In holding the mirror up, he forces each of us to examine our responsibilities in these fundamental matters and challenges us to collectively scrutinise the relationship between science, society and humankind in our efforts at building a sustainable future. (Prof. Dr. Michael J Morley, University of Limerick, Ireland, President of IFSAM)

In *Unsafety*, Professor Shigeo Atsuji has written a wide-ranging review of the dangers of inept, poorly-considered, profit-motivated managerial practices that have led to a series of modern 'disasters' in Japan and elsewhere in the world. While the origins of such disasters are often found in nature, it is the pathology of human organizations that is the focus of Atsuji's scathing criticisms. With particular emphasis on the recent nuclear disaster in Fukushima, he is careful to distinguish between the unavoidable dangers present in the natural world and the fully avoidable dangers that are inherent to a corporation mentality where individual managers, decision-makers and the executive elite are happy to share in the profits, but not in the burdens of systemic mistakes. A 'must read' for anyone interested in the future evolution of organizational management in a sustainable world. (Prof. Dr. Norman D. Cook, Kansai University, Japan)

Prof. Atsuji is a unique scholar in social science. 'Unsafety' will make a significant breakthrough in normative sciences using interdisciplinary approaches. The authors of J. Reason's *Organizational Accident* and S. Bennett's *Disaster Management* are the pioneers of thinking on human accident and disaster. This book differs in presenting new issues: lost compliance in the Fukushima nuclear disaster, failure of management in the Japan Railways accident, the possibility of climate change from nuclear-heated oceans, and catastrophe arising from the linking of natural and unnatural disaster. (Prof. Dr. Koichiro Hioki: Management Philosophy, Kyoto University, Japan)

I wanted to make some return for the insights I have gained from overseas experts while presenting papers on the Fukushima nuclear disaster to the World Conference of the International Society for the Systems Sciences and the

International Federation of Scholarly Associations of Management. It is an honor for me to be published by Springer International Publishing for which I thank the Springer publishing editors Mr. Yutaka Hiraji and Ms. Shinko Mimura of TSS series. I would also like to recognize the contribution made to the publication process by Kazue Shinji and Thomas Hannon, who assisted with English language proofreading and translation, and by my doctorate students Kazunori Ueda and Ryōsuke Fujimoto, who provided collaboration. I appreciate their kind thoughts.

The present research is published in the *Translational Systems Sciences Series* by Prof. Hiroshi Deguchi (2004) and Prof. Kyouichi Kijima (2015), who are international systems scientists I respect. This book was supported by a scientific research grant from the Japanese government. Some of the book's research findings have been the subject of scientific papers. (MEXT KAKENHI Grant Number 24530437).

March 2015

Shigeo Atsuji



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- 1 Masdar: Exploring Our Future, Saint Thomas Productions, France, 2012
- 2 The Future of Spaceship Earth, NHK, NEP/Primitive Entertainment, 2013–2014
- 3 Déchets: Le Cauchemar Du Nucléaire 25, Bonne Pioche/Arte France, France, 2009
- 4 What Happened at That Time? Series “Nuclear Power Plant Crisis, the Melt-down”, NHK Special, 2012
- 5 Fukushima’s Nuclear Disaster as Seen from the US., NHK, 2012
- 6 Inside Japan’s Nuclear Meltdown, Quicksilver Media/WGBH, UK/USA, 2012
- 7 The Series “Meltdown File 2”, NHK Special, 2012
- 8 Nuclear, Nothing to Report, Crescendo Films Iota Production, France/Belgium, 2009
- 9 Earth: Energy Quest USA, Passport to Knowledge Productions, USA, 2012
- 10 Can We Live Forever?, WGBH / Boston, USA, 2011
- 11 Why Poverty? Park Avenue: Money, Power & the American Dream, Democracy Pictures, NHK BBC DR ITVS SVT ZDF/Arte VPRO Steps International, 2012
- 12 Japanese Natural Resources at a Critical Juncture, Today’s Close-Up, NHK, 2013
- 13 Mega-quake I, NHK Special, 2012
- 14 Overflowing Contaminated Water in the Fukushima Plant, Today’s Close-Up, NHK, 2013
- 15 Can We Accuse the Company of Crimes? Eight Years After the JR Fukuchiyama Line Train Derailment Accident, Today’s Close-Up, NHK, 2013
- 16 Series of Abnormal Weather Events: What Is Happening to the Earth?, August 29, 2013
- 17 Contaminated Water Crisis, Today’s Close-Up, NHK, 2013
- 18 Contaminated Water: State of the Fukushima Plant, Today’s Close-Up, NHK, 2013

- 19 3.11 Mega-quake, NHK, 2013
- 20 Loss of 320,000 Lives: How Can We Protect Lives from Mega-quake?, NHK Special, 2012
- 21 Terms and Conditions May Apply, Hyrax Films/Topiary Productions, USA, 2013
- 22 Google and the World Brain, Polar Star Films/BLTV, Spain/UK, 2012
- 23 The Sea of Japan: Gigantic Resources Unexploited in Its Deep Sea, NHK Special, 2013
- 24 Nuclear Terror: New Risk Threatening Japan, NHK Special, 2013
- 25 Continuous Typhoons: Why Such Unprecedented Torrential Rain?, NHK
- 26 Super-Typhoon in the Philippines, November 18, 2013, NHK
- 27 Report Update! Where Global Warming Goes, Science Zero, NHK, 2013
- 28 In Nuclear We Trust, Morgan Production/Kami Productions, France, 2013
- 29 The Atomic States of America, 9.14 Pictures, USA, 2012
- 30 Decommissioning Nuclear Power Plants: Mission Impossible?, Arte France/ Eclectic Presse, France, 2012
- 31 The Carbon Rush, Byron A. Martin Productions/Wide Open Exposure Productions, Canada, 2012
- 32 The Clean-Tech Future, VPRO, Holland, 2012
- 33 Power to the People, VPRO, Holland, 2012
- 34 Down-Winders: The Struggle of American Nuclear Test Victims, NHK Hiroshima, 2014
- 35 Why Do Renewable Energy Projects Not Advance, Today's Close-Up, NHK, 2014
- 36 How Will the 3.3 Trillion Yen Be Spent?: Monitoring the Recovery Programs, NHK Special, 2014
- 37 Series "Meltdown File 4: Vast Release of Radiation", NHK Special, 2014
- 38 Prevention Measures for Nuclear Accidents: Evacuation Plans, Today's Close-Up, NHK, 2014
- 39 Decisions of 130,000 Evacuees: Three Years After the Fukushima Accident, NHK Special, 2014
- 40 Mega-quake II-3: Prepare for the Worst Scenario, NHK and National Geographic Channels International (NGCI), 2012

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