

Copyright © 2000 by The Resilience Alliance

The following is the established format for referencing this article:

Bossel, H. 2000. Book Review: National Research Council Board on Sustainable Development. 1999. Our common journey, a transition toward sustainability. National Academy Press, Washington, D.C. Conservation Ecology 4(1): 17. [online] URL: <http://www.consecol.org/vol4/iss1/art17/>

---

## Book Review

National Research Council Board on Sustainable Development. 1999. ***Our Common Journey, a Transition Toward Sustainability.*** National Academy Press, Washington, D.C..

[Hartmut Bossel](#)

---

## Sustainable Systems Research

- [Book Information](#)
- [Responses to this Article](#)

*Published: July 4, 2000*

---

The facts: The global human population has tripled in the lifetime of this (sexagenarian) reviewer; its momentum will double global population again in this century. Average per capita consumption of goods and services continues to increase as the consumption standards of industrialized countries are spread by a globalizing economy. The twin threats of increasing population and increasing per capita resource consumption and waste generation are threatening the life-supporting systems and functions of the environment. If this process continues unabated, the human project is unsustainable.

If reason were to prevail, the transition toward sustainability would have topmost priority on the human agenda, and it would be at the focus of most scientific research. It isn't now. In their report on a four-year project, the 25 members of the Board on Sustainable Development of the U.S. National Research Council draw attention to this deficit, design a scientific agenda, and assign research priorities. "Our Common Journey" is an important guide for science policy, research projects, and even individual careers in science and technology.

From the dynamics of population and consumption trends, the authors derive the time frame for their study: two generations. The transition toward sustainable development will have to be achieved by 2050, and it requires concerted effort to attain the primary goals defined by the Board "to meet the needs of a much larger, but stabilizing, human population, to sustain the life support systems of the planet, and to substantially reduce hunger

and poverty." The authors stress that the path to sustainability cannot be charted in advance, but that it will have to be navigated adaptively, making intelligent adjustments to unforeseeable developments and unavoidable surprises through the process of social learning. However, this requires clearly articulated goals, understanding of the past and the trends of social and environmental change, tools for analyzing and comparing alternative pathways, clear signals of threats and opportunities, and the setting of priorities. The report deals with these issues in considerable detail, drawing on a large supply of relevant studies and literature.

In their first chapter, the authors deal with the (normative) question of what should be sustained and what should be developed in "sustainable development." This leads them to the primary goals, which are then spelled out in greater detail: providing food and nutrition, nurturing children, finding shelter, providing an education, finding employment, ensuring quality and supply of fresh water, controlling emissions into the atmosphere, protecting the oceans, maintaining species and ecosystems, and reducing hunger and poverty.

The second chapter explores major historical trends and transitions that will affect the prospects for sustainability over the coming decades. Human development is characterized by population growth, urbanization, improved well-being, growing wealth and growing disparities, greater consumption, changing and more efficient technologies, lessened work, increasing connectedness, persistent diversity, changing institutions, and shifting power. Human action causes environmental transformations by air pollution, altering the chemical composition of the atmosphere and changing climate; by changing coastal zones and depleting fisheries; by excessive withdrawal, pollution, and ineffective use of water; by intensification of agriculture and deforestation; by decreasing species diversity and losses of ecosystems; by emergence of new diseases and resurgence of old diseases. These trends are likely to persist and undermine the prospects for sustainability. If they do persist, the primary goals cannot be met.

The third chapter examines the strategies and tools that can be used to explore future paths to sustainability, stressing their scientific credibility, political legitimacy, practical utility, and effectiveness. Three approaches are identified as particularly promising, and presented in some detail: integrated assessment models, scenarios, and regional information systems. Many research challenges for improving these tools are recognized. An appendix presents results of a scenario study for a transition toward sustainability. The Board concludes that a successful transition toward sustainability is possible over the next two generations, and that it can be achieved without miraculous technologies or drastic social change.

The fourth chapter seeks to identify the greatest threats to a sustainability transition, as well as the most promising opportunities. In an environmental perspective, water and air pollution, ozone depletion and climate change, droughts and floods, disease epidemics, and the availability of local living resources are seen as top priority issues. In a development perspective, following the Brundtland Commission, threats and opportunities are analyzed in particular sectors: population and well-being, cities, agriculture and food security, industry, energy, and living resources. In an interaction perspective, water and water management, atmosphere and climate, and species and ecosystems are seen as crucial issues. The Board concludes that the most troubling threats arise from multiple, cumulative, and interactive stresses or syndromes, driven by a variety of human activities. Developing an integrated and place-based understanding of these threats and the options for dealing with them is therefore vitally important.

The fifth chapter deals with appropriate monitoring and indicator systems for charting progress in a transition toward sustainability. Multiple indicators are needed to assess goal attainment with respect to human needs and the preservation of life support systems. Different systems of indicators are discussed and compared. The Board finds that there is no consensus on the appropriateness or scientific basis of the different indicator sets; it therefore defines its own set for measuring progress toward its primary goals. Some of these indicators are already being monitored by different agencies. The authors stress the importance of regional indicators for identifying criticality, and the potential usefulness of capital accounting (natural, human/social, and produced capital).

In the sixth and final chapter, the Board stresses the importance of developing a strategy for mobilizing scientific knowledge in programs of purposive social learning and adaptive management committed to the promotion of a sustainability transition. It sees three priority tasks for a research agenda of "sustainability science" linking research in biological, technological, geophysical, and social systems: "(1) Develop a research framework for the science of sustainable development that integrates global and local perspectives to shape a place-based understanding of the interactions between environment and society. (2) Initiate focused research programs on a small set of understudied questions that are central to a deeper understanding of those interactions. (3) Promote

better utilization of existing tools and processes for linking knowledge to action in pursuit of a sustainability transition." Corresponding research topics are developed in some detail. The authors then discuss priorities for action, following the agenda of the Brundtland Commission: fertility reduction, urban systems, agricultural production, efficiency of energy and materials use, ecosystem restoration and diversity conservation, and integrated study of dynamic interactions at the regional scale.

For workers in sustainability-related fields, the report offers no new insights, but perhaps an implicit and encouraging recognition of their role in an emerging "sustainability science." For others, it is an excellent introduction to this challenging area of science and its many facets, with so many unsolved tasks begging innovative contributions from the natural and social sciences. The very extensive reference lists allow one to delve deeper into particular areas of interest. For those determining science and research policy, the book is a must. In a readable, well organized, clearly argued, and fully substantiated style, it delineates the threats facing society and the tasks that must be solved if sustainability is to be achieved within two generations.

To this reviewer (a systems scientist), the report suffers from two faults, which do not, however, detract from its usefulness under current conditions: lack of a systems perspective, and failure to recognize social, political, and economic structure and culture as primary drivers of unsustainability. The authors, all from traditional science and engineering disciplines, realize the need for an "integrative science" to deal with the sustainability transition, but they do not seem to recognize this dynamic process as one involving coevolutionary interactions of complex, adaptive, self-organizing systems in the natural environment and society. Systems science provides a coherent framework and perspective for such complex problems, and its application would have led to better substantiated, more complete sets of priorities and indicators, for example. It also would have drawn attention to the fact that research and action priorities must not go to the symptoms of unsustainability (such as pollution, climate change, and hunger), but to the causes of high birth rates, wasteful production, excessive consumption, injustice, and inequity that threaten sustainability. These causes require a critical reflection of the social, political, economic, and cultural values and attitudes prevalent in a society – and the willingness to change them.

---

## BOOK INFORMATION

National Research Council Board on Sustainable Development. 1999. Our Common Journey, a Transition Toward Sustainability. National Academy Press, Washington, D.C.. 384 pp., paperback, \$US 49.95. ISBN 0-309-06783-9.

---

## RESPONSES TO THIS ARTICLE

Responses to this article are invited. If accepted for publication, your response will be hyperlinked to the article. To submit a comment, follow [this link](#). To read comments already accepted, follow [this link](#).

---

### Address of Correspondent:

Hartmut Bossel  
Galgenkoeppel 6B  
D 34289 Zierenberg, Germany  
Phone: +49.5606.8241  
[H.Bossel@T-online.de](mailto:H.Bossel@T-online.de)

