

Social Ecology in the Digital Age: Solving Complex Problems in a Globalized World

By Daniel Stokols

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Social Ecology in a Digital Age is a comprehensive overview of the theoretical development and application of social ecology to understanding the wicked problems humanity faces today and in the future. It chronicles author Daniel Stokols's personal journey, including his joining the Program in Social Ecology in the early 1970s at the then relatively newly founded University of California Irvine, and his development as a teacher and scholar within that program. It is also a narrative of the emergence of social ecology as an approach to the changing problems of the world, including the development and consequences of novel phenomena, such as digital technology. *Social Ecology in a Digital Age* makes a valuable contribution to all students, researchers, and policy-makers who are grappling with transdisciplinary approaches to socioecological situations that are both unsustainable and unjust, and demand interventions to transform them for the better. Consequently, this book is highly relevant to human ecologists, as demonstrated by it being awarded the Society for Human Ecology's 2018 Gerald Young Book Award.

Chapter 1, "Discovering Social Ecology: A Personal Journey," sets out Stokols's own academic background and what drew him to social ecology. It culminates with the analytical framework of social ecology as a tool for mapping the interconnections between the natural, built, sociocultural, and cyber dimensions of human communities. Chapter 2, "Historical Origins and Conceptual Foundations of Social Ecology," next details how this approach developed over time and what Stokols perceives as its unique and distinguishing features, specifically what sets it aside from its very close cousin in human ecology. These characteristic features are elaborated in Chapter 3, "Deriving Core Principles of Social Ecology." These principles include that social ecology understands human environments as multifaceted, with natural, built, sociocultural, and virtual cyber-based dimensions, and recognizes that these spheres need to be analyzed across multiple scales. A second principle is that the interactions between people and these spheres form feedback systems, and, thus,

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need to be understood from a systems-thinking perspective. Third, social ecology commits to methodological plurality, as different problems at different scales need to draw on different concepts and methods to adequately propose solutions for them. Finally, and arising necessarily from the previous principles, social ecology is transdisciplinary and translational, in that it seeks to apply its research findings to improve a situation under study.

Having established the conceptual framework of social ecology across the first three chapters, Stokols then moves to demonstrate their application in a number of contexts and scales. In Chapter 4, “Rise of the Internet: Navigating Our Online and Place-Based Ecologies,” Stokols focuses on the subtitle of the book as a whole with the emergence of a new dimension in human-environmental systems, cyberspace, and with it the digital age.² Its psychological, health, social, and environmental effects are addressed along with its mixed blessings. Personally, I am grateful to have had the term “Google Knowledge” introduced to me to indicate the narrow and uncritical knowledge one can gain about absolutely anything, and will definitely be adding it to my QuickMark options for grading student papers in the future. Nevertheless, digital literacy is a functional requirement for modern society, and Stokols rightly describes the situation that nearly half the global population does not have access to the digital world as an “epistemic injustice.” The challenge is to provide that access and simultaneously harness the benefits of the digital age while minimizing its burdens and harm.

Chapter 5 is on “Promoting Personal and Public Health” and provides a history of the development of the biomedical approach to health and disease, and the later emergence of a biopsychosocial model. The latter is conducive to socioecological analysis, which is better able to understand the biophysical and sociocultural context within which choices are made. An example is the broader contexts that constrain which decisions are made concerning what to eat as well as the health consequences, such as incidents of obesity, that follow. Stokols presents examples of such issues across scales, from the individual, to family, to neighborhood, and city region and above, demonstrating the nested contexts within which health and well-being issues arise. The chapter closes with a brief discussion of digital technologies’ contribution to future health care—for example, in online health services.

Chapter 6, “Confronting Complex Social Problems,” further applies a socioecological framework, initially through an analysis of a low socioeconomic status community and their struggle with a waste tip located within proximity. Lessons drawn from this example include the need to address contextual scope—meaning the often contested boundaries placed on the spatial, temporal, sociocultural, and virtual aspects of a problem—and that different stakeholders in a problem’s situation identify different objective and subjective dimensions of that problem itself. In the

2 In his contribution to this issue, Stokols discusses these effects at the scale of indoor environments.

waste tip example, the council's emphasis was on objective elements, such as if the tip conformed to environmental standards, while the community's emphasis was on the subjective dimension of living near a tip and the social justice dimension that the tip was where it was because the community in question was politically disempowered. This last lesson overlaps with the need to view problems both from an individual perspective (concerning statistical estimates of the health risk to an individual), and an aggregate or community perspective, such as the community stress of distributive and process injustice. A final lesson drawn in understanding social problems is the distinction between the partitive component, or the narrow cause and effective relationship (here, between the immediate effect of such tips on individuals' health), against the composite component, being the broader physical, mental, and emotional dimensions of individual and community well-being. The second half of the chapter concerns examples of narrowing the digital divide with socioecological approaches, featuring an overarching message about the limited contribution individual disciplines can make to solving complex human-environmental problems.

Chapter 7, "Managing Global Environmental Change," then applies the social ecology approach at a larger scale. A contrast is drawn between the relative success of international efforts to control chlorofluorocarbons and their damage to the Earth's ozone layer, alongside the less successful international effort to limit greenhouse gas emissions and climate change. The chapter further engages with other planetary thresholds, of the kind identified by Rockstrom et al. (2009), and discusses how collectively we can reduce our environmental effects while allowing the under-consuming and developing world greater justice and access to the Earth's resources. Stokols notes that achieving this turnaround will require both top-down policies, such as those forged through international negotiations, as well as bottom-up steps taken at much more local levels of city mayors and communities. Chapter 8, "Designing Resilient and Sustainable Communities," picks up on the closing sentiments of the previous chapter, being that we need to collectively redesign our human-environmental systems to be both just and sustainable, and usher in a new Anthropocene, which can be celebrated rather than feared (Anthropocene 2.0). As with all previous chapters, Stokols emphasizes the nested scales at which action is needed, and the importance of synergistic outcomes for both environmental health, and the health and well-being of people and communities. The chapter emphasizes that a "good Anthropocene" will require a much broader set of measures of human values than mere economic indicators. According to Stokols, it will also require concerted and collaborative efforts from policy areas and knowledge bases that do not typically view themselves as having common cause:

Social ecological analyses and solutions to these problems require transdisciplinary approaches that draw not only on the macroscale views of earth system science, society–nature relations, economics and international governance but also insights derived from urban planning, environmental design, public health, informatics,

psychology, and social behavior—fields that address meso- and micro level (e.g., municipal, organizational, behavioral) facets of people’s relationships with their surroundings. Transdisciplinary conceptions of social and human ecology must bridge these disparate perspectives if they are going to be able to provide multiscale, comprehensive solutions to today’s challenges. (p. 296)

This is no easy challenge, but as Stephen Boyden noted back in 1986:

the whole question of the dynamic interrelationship in the modern world between human populations and their environments really is a complicated one, and the subject is very difficult. It is very much easier to be a good specialist in one of the traditional academic disciplines than it is to be a good human ecologist. (p. 3)

Having established the need for comprehensive solution-oriented approaches to complex problems, Chapter 9 completes the book with an important discussion of how we can educate more people to think this way. In “Educating the Next Generation of Social Ecologists,” Stokols sets the core learning outcomes of social ecology as being “to train students to analyze scientific and policy questions from a broad social ecological and interdisciplinary vantage point, and to apply basic theory and research toward resolving complex societal problems” (p. 321). Stokols also sets out the four Ts of social ecology as being transdisciplinary, translational (turning findings into outcomes), team-oriented, and transculture. He also emphasizes the need to work across knowledge bases, including with communities, practitioners, and policy-makers in off-campus collaborations. These are all sentiments and goals that human ecologists can readily agree on, but, of course, the issue remains that most large-scale universities are structured along traditional disciplinary lines. Further, major grant applications favor narrow, discipline-based projects, academic promotional rounds are often vetted by disciplinary specialists who place premiums on mono-authored papers in prestigious disciplinary journals, and the main entry certificate to an academic career is a solo-authored PhD. If we are to generate graduates with the skill sets necessary to address the major problems of their times, we need many more programs (such as social ecology and human ecology), and institutional reform to accommodate and encourage them, in turn. Stokols seems to concur, writing that the grand challenges we face demand a comprehensive redesign of universities around the world to replace “traditional academic departments organized around arbitrary (and increasingly ‘ossified’) disciplinary boundaries with problem-oriented ... schools and institutes” (p. 340). I could not agree more.

Stokols finishes *Social Ecology in the Digital Age* with a short epilogue reflecting on his intellectual journey in writing the book, and on some of the social and political changes that occurred in that time. Given that he started the work in 2014 and completed it in 2017, those changes in the political landscape have been significant. I can only imagine and sympathize with the amount of rewording Stokols had to do to his manuscript after November 2016. Still, approaches to understand human-

environmental problems that are not merely descriptive but are also change-oriented and morally concerned, much like social ecology and human ecology, are needed in these times arguably more than ever.

Overall, Stokols's book is an important and timely contribution with lasting value; however, I am not without some criticism. For example, I do not agree with Stokols's claim that human ecology only deals with macroscale events, as any issue of *Human Ecology Review* will demonstrate. In fact, I would argue that providing a framework for decomposing macroscale and general principles to microscale and specific contexts is one of human ecology's important contributions (see Dyball & Newell, 2015). I neither think human ecology is particularly challenged upon including cyberspace as a significant variable that affects flows of energy, material, and information in the modern era. Essentially, I really cannot see anything that distinguishes social ecology from human ecology, but potato, potato, as they say (which makes more sense said out loud than in writing). Beyond that, I feel that Stokols's association of human ecology with the work of Park and Burgess in Chicago in the 1930s is something of a straw man argument, which does not do justice to significant developments in the field taken since (see *Human Ecology Review*, vol. 23, no. 1, for an overview). Finally, there are some contributors to human and social ecology that I am a little surprised were omitted. Notably, Stephen Boyden pioneered much of the ideas around the co-benefits of healthy environments for healthy people, as acknowledged by *The Lancet* (Horton, 2015). In a pre-digital 1969, in his book *Design With Nature* Ian McHarg forged many concepts around urban design approaches that work with natural forms and processes. Ulrich Beck, Peter Checkland, Gerald Midgley, and Ray Ison are all systems-thinkers who have contributed a great deal of work around inclusive problem-solving and boundary setting. Finally, while Stokols acknowledges Val Brown et al.'s (2010) work to advance Rittel and Webber's "wicked problems" in *Tackling Wicked Problems*, it seems an oversight that Functowicz and Ravetz do not receive mention in relation to working on urgent, value-laden problems in democratic partnership with communities. Their "post-normal science" (Funtowicz & Ravetz, 1993) seems very much the model of what social ecology so advocates. However, I am guilty of starting to review a book I would have written had I penned *Social Ecology in the Digital Age*, which I did not. Dan Stokols wrote it, and a very fine piece of work it is. I highly recommend it to anyone working in the field, whatever they have chosen to name their department.

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