

Understanding Human Ecology: A Systems Approach to Sustainability

By Robert Dyball and Barry Newell

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Already endowed with praise from influential thinkers and educators in sustainability from around the world, including the United Nations University and Stockholm Resilience Centre, this review adds one more voice of praise for the role of *Understanding Human Ecology* as a critical contribution that brings clarity to a path forward on a subject that is gaining critical mass in the geopolitical landscape—*sustainability*.

The interdisciplinary nature of sustainability work often means those involved run into friction that is a result of differing ideologies, worldviews, methodologies, and, moreover, a common vision of success. This friction is paralyzing progress at a time when scientists finally agree that the Anthropocene may be an elegant term for a period of planetary destruction. What Dyball and Newell contribute to the (hopefully) early Anthropocene, and to the field of sustainability in general, is to bring together their extensive expertise in human ecology and physics to first unpack and then bring together social and cognitive sciences, communications theory, and systems dynamics theory. The result is an accessible text that brings the reader to a new understanding of how to overcome this paralysis to act strategically despite the complexity of the sustainability challenge, and collaboratively in an inherently interdisciplinary process.

Part 1 provides an illustration of the sustainability challenge through the lens of a human ecologist, weaving the human behavior–ecosystem response threads together in the Snowy Mountains of Australia, where sociopolitical decisions made over the course of a century made permanent ecological changes which in turn, of course, had sociopolitical implications. This illustration is presented in a way that global readers can easily translate the core concepts into similar examples more local to their context and, furthermore, apply the systems approach elaborated in Part 2.

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The second part of the book focuses on bringing the reader up to par on the theoretical grounding of the paradigm to be proposed in Part 3. Dyball and Newell borrow from cognitive sciences to clarify the human nature of developing cultural worldviews, or mental models, which not only direct our thinking and actions, but our unconscious expectations of others' behavior, and the environment. Complicating global progress to sustainability is that these worldviews differ geographically, culturally, and across disciplines. The authors propose that truly transdisciplinary, or "comprehensive" approaches to sustainability challenges require communication frameworks that rise above this barrier to build bridges across worldviews. And true to the accessible nature of the book, they make practical suggestions to guide practitioners and thinkers alike toward developing universally effective metaphors, called "powerful ideas," to do just that. As tools, powerful ideas facilitate critical transdisciplinary and cross-cultural understanding while still allowing healthy diversity in ideology, worldviews, and methods for action.

Layering in systems dynamics theory, the authors go on to utilize powerful ideas to illustrate how humans and ecosystems interact in ways that are indeed relatively predictable. How we accumulate water in reservoirs, regulate the level of that water through inflows and outflows, and how human intervention in those flows can influence the volume of water, provides a good example of a universally accepted, and relatively predictable idea. Perhaps less well understood are how human behaviors interact with ecosystems in complex ways that generate unexpected delays, oscillations and collapse in otherwise predictable systems, such as water reservoirs. Part 2 lays the groundwork for a theoretical framework that borrows from systems theory and Boyden's transition framework to unravel complexity and develop a framework for cultural adaptation based on the idea that expected or unexpected (i.e., regardless of worldview) social and ecological responses in a system (e.g., delays in, volume of, or collapse of the water stock) create feedback loops in the system that ultimately feed into cultural shifts in worldviews, or cultural paradigms shifts. Perhaps even more important is that this application of system dynamics lends versatility that makes it applicable to broad global challenges (e.g., "limitless growth paradigm") equally well as to more narrow, localized issues (use of air conditioning units).

Part 3 takes the reader through a historical and anthropological journey of how cultural paradigms have adapted through time, to affect our food production and consumption systems. We have moved from a dominant worldview that working with nature we can procure food, to a worldview that domination over nature will produce *more* food. This shift was a logical (to the time) change in cultural paradigm in part due to the feedback loop coming from increasing technological advances in our culture.

We are now sitting at a historical juncture where the feedback loop coming from increasing damage to ecosystem and human health is forcing a new cultural paradigm. Part 3 follows up with clear summaries of the current state of knowledge of how the dominant development paradigm, framed as “limitless growth,” is affecting the ecosystem that sustains us and, subsequently, our own health and well-being. Also explained is how globalization has caused “delays” in the feedback mechanisms for this self-destruction, damage that might otherwise have caused us to alter our course at an earlier juncture, and how high levels of food-system vulnerability (through damage to ecological and social mechanisms) can be traced back to the state of a country’s cultural paradigms (e.g., belief in global markets).

Finally, the authors offer an alternative cultural paradigm, which embeds concepts of sufficiency (vis-à-vis growth) and biosensitivity as a solution for unified progress toward sustainability. They then provide examples of how cultural adaptations, through transformative learning, can be game changers.

Understanding Human Ecology is a particularly valuable contribution toward the practice and scholarship of building sustainable food systems. It exceeded my expectations in balancing theoretical and practical without idyllically ignoring the complexity of human behavior and motivations that smudge the edges of the pathways that lead us toward “living well in the Anthropocene.”

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