



International Conference on Sustainable Design, Engineering and Construction

Living Within Humanity's Life-Support System

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Abstract

Paper addresses the state-of-knowledge of complex adaptive systems -- including their operation via cycles of innovation and co-adaptation -- to sustain continuous, whole-system complexity and full-functionality. Emerging understanding of how humanity can live appreciatively within complex adaptive systems (Planet Earth, ecosystems, cities, etc.). Strategies of Appreciative Inquiry -- as model for decision-making and strategic change -- that provide the data needed to live appreciatively, co-adapt with complexity, and thrive by living within complex systems. Explores the integrative management of energy, water and food systems -- WEF Security Nexus -- as catalyst for living within complex systems; and how integrative management builds self-reliance and local eco-entrepreneurs essential to achieving the global goal of sustainability.

Overview of Sustainable Communities Institute's (SCI) application of knowledge about complex systems, living appreciatively, and AI strategies to help communities interconnect sustainability's triple bottom line -- ecological, social and economic -- with appreciative system dynamics, to empower communities to thrive by living sustainably. How SCI facilitates appreciation of ecological systems as primary human supports, infrastructural systems as secondary supports, and the built-environment as tertiary supports; and sustainable development as synergy of the three to sustain full-functionality of the complex system upon which we rely. Overview of SCI projects including ones focused on optimizing the WEF Security Nexus and others focused on enhancing the ability of a key system -- e.g., food system -- to catalyze community change to thriving in the current context of accelerating system change.

Concludes with discussion of new potential unleashed by integratively managing the WEF Security Nexus and the three levels of human supports as catalyst for living sustainably; tools for assessing the degree to which this change is occurring, and co-adaptive processes for facilitating emergence of community self-reliance and the ability to thrive during the current turbulent time of complex system change.

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1. Systems and Complexity

Living within humanity’s life support system is about learning to live within Planet Earth as a complex adaptive system [1]. It is also about learning to live as what Erich Jantsch called an appreciative system that realizes humanity as a "unique device for relating to a reality in whose shaping....(he or she) is actively and creatively participating” [2].

Living within Systems™ means that humanity lives within systems that are diverse in nature yet highly interconnected in functionality. These include static systems; and those that are dynamic and sustain themselves through regeneration and change over time. It also includes systems that are simple in their interconnectivity of parts and behaviors; and complex adaptive systems that are sophisticated in number and depth of interconnections, highly dependent on these interconnections for functionality, and dependent on co-adaptation of parts and behaviors to sustain full-functionality [3].

For about 70 years, human consciousness has been evolving from a mechanistic view to a complexity-science understanding of systems, including complex adaptive systems that operate through cycles of innovation and co-adaptation, and depend on deep connections to sustain complexity, continued health and full-functionality of the system and its subsystems. This 70-year evolution is nicely summarized in the Complexity Map [4], Figure 1.

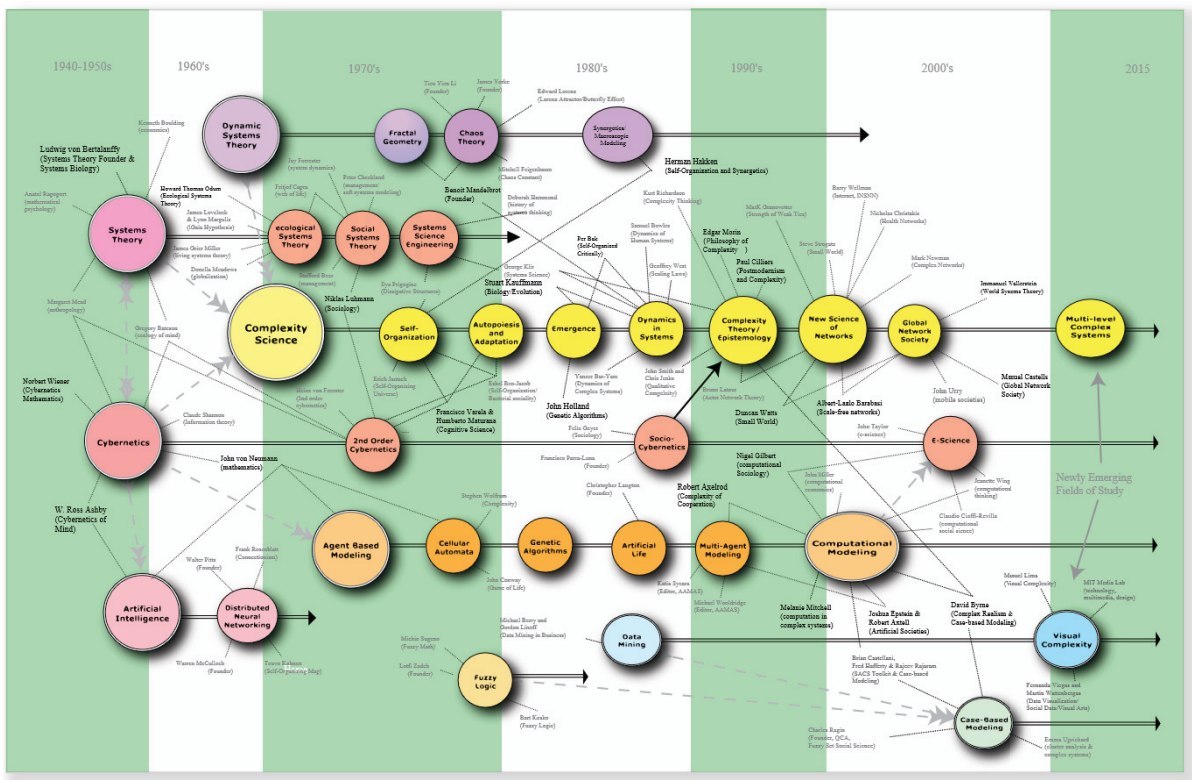


Figure 1. "Complexity Map" by Brian Castellani - Own work. Licensed under CC BY-SA 3.0 via Wikimedia Commons - https://commons.wikimedia.org/wiki/File:Complexity_Map.svg#mediaviewer/File:Complexity_Map.svg

2. How Complex Adaptive Systems Work

Complexity-science tells us that to live within humanity’s life-support system we must appreciate and help sustain system complexity. We contend herein that to do so, we must first understand the dynamics through which complex systems function. While the list could be exhaustive, we see the following as essential to understanding how

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