Twelve Simple Rules of Systems Thinking for Complex Global Issues

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The study of living systems – through biology, physics, mathematics, cybernetics, ecology, complexity theory, chaos theory, systems thinking, and other sciences – helps us understand the world we live in and how we can better navigate its rich, if sometimes daunting, complexity.

Our human systems at various levels of organization – the individual, families, communities, affinity groups, organizations, nations, international entities, etc. – all exhibit the common dynamics of living systems.

We are increasingly aware that many of our living systems – human and natural – are at risk today, as we face incredibly complex and interconnected challenges related to global security, environmental degradation, and inter-woven economies. Understanding the nature and dynamics of living systems, therefore, can shed light on how we think about our problems and our resources, and about the assumptions and the choices we make.

What follows are 12 basic concepts about living systems and their implications for policy considerations when dealing with some of our greatest and most difficult challenges.[1] Each 'therefore,' though stated simply, can be expanded out to include several other key concepts and implications for action.

Simple Rules:

1. In complex systems, all the elements or agents are interconnected, as in a giant web. They are also interdependent – what happens to one affects all others. Therefore: **Connect the disconnected.**

Example:

- The relationship of the global economy with natural support systems (water, soil, climate, etc.) requires integration of knowledge across sectors (economists, demographers, agricultural experts, water experts, ecologists, etc.) and the inclusion of voices rarely heard in policy considerations – especially the recipients or beneficiaries of programs and those most affected by their outcomes.

2. Complexity is the nature and condition of living systems and the world we live in. What we know about complex systems is that there are multiple agents or elements, combining and interacting in unpredictable and non-linear ways. This means decisions often lead to unintended consequences. Therefore: **Ground yourself in unpredictability.**

[1] These twelve concepts are synthesized from an extensive dialogue among a number of prominent systems thinkers in the fall of 2008.

Example:

- Security threats are so numerous and diverse – some so unpredictable that we can't even imagine them – that we cannot possibly prepare in advance for every contingency. What we can do is foster flexibility, nimbleness, resilience, cooperation, and creativity within and between government and society.

3. In that giant web of interconnectedness, the points or nodes where the agents meet are the relationships, or opportunities for interaction. These interactions determine what will happen to the system. The nature and quality of these relationships, therefore, are critically important. Therefore: **Create conditions for quality engagements.**

Example:

- Social healing/dialogue initiatives that bring former enemies into new relationships with one another in such conflict settings as N. Ireland, Bosnia, Cyprus, Israel/Palestine, or Nepal can change the nature of political and social relations, and can ultimately contribute to official negotiations as well.

4. We know that all living systems exchange energy, matter, and information across their boundaries. When we can identify imbalances in these flows - stuck places, over- or under-accumulation, etc – we can shift things to be more equitable and more sustainable. Therefore: **Re-balance the flows across boundaries.**

Example:

- Because capital has over-accumulated in large financial institutions while millions lose their incomes and their homes, the MoveYourMoney initiative to take investments out of large banks and put them instead in small, community-based institutions, or the shifting of bail-out money from Wall Street to Main Street, are ways to re-balance the flows.

5. All living systems develop patterns. Often these patterns are self-reinforcing and become deeply embedded and difficult to change. Many of these patterns in human systems are common and recognizable. Patterns also show up in similar forms at different scales or levels of the system. Therefore: **Re-pattern for sustainability and well-being of the whole.**

Examples:

- The movement toward asset-focused analysis (e.g. in GDP formulation that includes quality-of-life measures; in education that builds on the strengths of each student; in business management that focuses on what's working well rather than what the problems are, and in health-care that emphasizes prevention) changes the pattern of focusing on the problems (debt, deficit, disease, etc.).
- Exploring the patterns common to issues of gun control in the U.S., the global spread of small arms, and proliferations of nuclear weapons can shed light on all three.

6. We know from living systems that everything is a whole in itself and at the same time part of a larger whole. Therefore: **Attend to ever smaller parts and ever larger wholes.**

Example:

- Addressing personal/credit card debt, bad mortgages, and the federal deficit, requires attending to each level as a problem in itself and also as a part of a larger picture. At each level there are unique features and also common themes and patterns. Being able to move back and forth among them, as with a telescopic lens, gives us more information to find better solutions.

7. Living systems organize themselves through the interactions of their agents or parts. The basic format of that organization is networks – that is, groups of parts joined together in a de-centralized way for some period of time. Therefore: **Pay attention to emerging networks.**

Example:

- Terrorist and criminal networks and cyber attacks have become as great or greater security concerns than traditional nation-to-nation animosity. Without understanding how networks work, we cannot hope to effectively address these situations.

8. Systems move between various degrees of stability and instability, order and disorder. When the disorder, or chaos, becomes too great, things fall apart. When the order is too rigid, things cannot grow or develop. Yet a certain degree of instability, or the edge of chaos, can also be a powerful moment of creative change. Therefore: **Seek coherence within chaos.**

Examples:

- The global economic meltdown plus the looming crisis over peak oil have also created conditions for innovative approaches to renewable energy and for new forms of economic exchange and investment to emerge. As new solutions arise, they attract more attention, more funding, more replication, and ultimately build new norms.

9. All living systems exist within a single field of potential, where the observer is a player, our thoughts have consequences, and creative solutions emerge. Therefore: **Look to the intangible as well as the concrete to see the potential.**

Example:

- The U.S. election of a black president touches deep historical resonances in the U.S. and around the world, making waves that go far beyond political realities and directly affect what's possible in our foreign relations.

10. Living systems exist within their own unique context. For human systems, that context is the narrative that gives meaning to our choices and actions. Therefore: **Articulate, communicate, and validate the stories you tell yourself.**

Example:

- The various political philosophies that guide decision-making are the stories we tell ourselves about what is true (regardless of whether they have proven to be so in practice or not). Yet conditions change, and old assumptions are no longer valid. For example, the shift in what we think makes us secure, from MAD

(mutually-assured destruction) to a nuclear-free world, is a major re-orientation of how we make sense of our world.

11. The parts of living (human) systems cohere around a common shared purpose. Therefore: **Define and revisit goals and purpose.**

Examples:

- JFK's commitment to put a man on the moon by the end of the decade galvanized the nation's energies and interest.
- Sanctions against so-called 'rogue' states frequently fail to achieve their purpose (indeed, they sometimes actually produce the opposite of the desired effect), yet are often escalated anyway, serving, perhaps an unstated and possibly unconscious purpose of feeling like we're doing *something* rather than the stated purpose of changing the regime's behavior.

12. Living systems are learning systems. That is, they adapt from the feedback they receive from their internal and external environments. Therefore: **Learn and change from inner and outer messages.**

Examples:

- The State Department's Quadrennial Diplomacy and Development Review (QDDR) is a networked initiative to gather and respond to internal and external feedback.
- Insurgency and counterinsurgency strategies continue to learn from and adapt to one another.