

LIVING SYSTEMS CHARACTERISTICS AND PRINCIPLES

- a. **Interdependence and Reciprocity** - The parts of an open living system are continuously and intimately influencing each other in ways that either maintain balance or create change, as needed.
- b. **"Nested Systems"** - A whole system contains systems within it (e.g. the body contains the immune system and bacterial systems) and is nested within larger systems (e.g. we breathe in and eat from the whole biosphere for our daily sustenance.) This requires permeable, flexible, but still coherent boundaries.
- c. **Purpose** - Living systems have a specific purpose in relationship to the larger systems into which they're embedded. Shared alignment of their members with that purpose accelerates a system's positive evolution.
- d. **Whole Systems Perspective** - To discover the source of a problem, you have to step back and widen your focus to include the bigger system. Symptom-oriented solutions usually end up creating more work later on. Discovering the system's invisible structures and relationships, and working with them, heightens systems creativity and long term resilience (e.g. the continuous *feedback loops* linking psychological, neurological, hormonal, and immune systems keep adjusting together to changes in ways that ensure resilience and health in our bodies.)
- e. **Openness** - Living systems require a continuous flow-through of information, through which they adapt and evolve in a changing environment. Our cultural frameworks, mostly linear and mechanical models, tend to treat individuals, organizations and environments, as closed rather than open systems, which greatly reduces their well-being and productivity.
- f. **Wholeness, Synergy** - The parts of a system must all be present for it to carry out its purpose optimally. Each system is a whole which is greater than the sum of its parts. Its distinctive nature and capacities derive from the interactive relationships between the parts. This interplay is synergistic, generating "emergent properties" and new possibilities not predictable from the separate parts. Without serious hindrances to the flows between the parts, this complexity can generate endless creativity.
- g. **Integrity, Holonomy** - Each system is a discrete entity and has an integrity that holds it together. Each part of a system also has its own integrity, which reflects the whole, and is essential to the functioning of the system. Its appropriate arrangement and function in relation to the other parts is essential to optimum system functioning. In human systems, we each have responsibility for helping to create and maintain the system as it is as well as tremendous leverage for changing it.
- h. **Self-Organizing, Self-Balancing** - Each system has its own inherent tendency to maintain or restore balance, integrity, and coherence in the face of changing conditions. Systems achieve stability through the interactions, feedback and adjustments that continually circulate among the system's parts and between the system and its environment. **Balancing or Stabilizing Feedback Loops** help a system keep to its goals by maintaining equilibrium and optimum functioning.
- i. **Self-Creating, Evolving** - Healthy systems adapt to persistent conflict, change and stress by seeking higher levels of complexity and integration. **Amplifying or Reinforcing Feedback Loops** accelerate the change process by compounding change in one direction with even more change in that direction, and thus are engines of either growth or collapse. Healthy systems have a robust mix of stabilizing and amplifying loops that help the system grow in balanced ways.
- j. **Multiple Functions, Redundancy** - Members of a healthy system usually serve multiple functions for the whole, which creates greater economy (e.g. skin protects, excretes, supports hair growth, regulates temperature, etc.). At the same time, there is often considerable redundancy of functions in a living system, which creates greater stability, in case some part of the system fails.
- k. **Closed Loops: No Waste** - There's ultimately no place to hide "messes" in a living system, since all parts are connected. All "waste" becomes "food" in a natural system. Efficient design in human-made systems replicates this closed loop quality of the natural world.
- l. **Limiting Factors and Leverage Points** - Tiny parts, often invisible, can play a huge role in the proper functioning of even large systems (e.g. soil and food micronutrients needed for proper brain and immune system functioning). Locating the limiting factors that are diminishing the balance and flow of the system can have huge payoffs.