
Appendix 1.1

The following material is Appendix 1.1 for Chapter 1 of: Fowler, C.W. 2009. Systemic Management: Sustainable Human Interactions with Ecosystems and the Biosphere. Oxford University Press

1 Reality/complexity

Systemic management is reality-based management and the term “reality” is used throughout this book; the term deserves definition. We need at least some common understanding of what is meant. In simple terms, the way reality is defined and used in this book, nothing is excluded—absolutely nothing.

Defining reality is an ultimately impossible challenge because we can’t know or conceptualize reality completely; we are dealing with the ineffable. Trying to capture the concept in words is futile owing to limitations of the human mind, imperfection, and limitations of words as human constructs, and the infinite of reality. Nevertheless, the following is an attempt to put words to this task so that there is at least a superficial sense of how the term reality is being used.

Complexity is also a frequently used term. In this book, complexity refers to the complex nature of reality.

Reality, as used in this book, refers to everything—not just collectively but to directly include all of the parts of reality (i.e., holarchically, or a nonexclusive combination of monism and dualism that also allows for reductionism). Reality is a system made up of systems. If it exists, happens, or occurs, it is part of the reality to which the term refers; reality embodies the holistic. This includes a “supernatural” God, if such a God is real. The whole of reality includes its emergent characteristics thus transcending its parts. Being the singular whole-with-its-parts, the only thing of which reality

can be a part is itself—the ultimate of holism, and something that some religions might refer to as God. It includes Gregory Bateson’s (1972) *pleroma* and *creatura* and their combination and interactions. Each of us is a part; our minds are parts; our societies, religions, emotions, perceptions, beliefs, and values are parts.

All real things can be referred to as realities so there is potential for confusion. This confusion is avoided in this book by using the term “a reality” (or “the reality”) to refer to any part of the ultimate reality referred to by the use of the more general term “reality”. Thus, every species is a reality, every process is a reality, every belief is a reality, every quark is a reality, every force is a reality, and every black hole is a reality; energy is a reality, our economic system is a reality, but each is always merely one of the parts of reality with all of its interactions and connections with, and effects on, the other parts. All parts, connections, and effects are components of reality making it a system with all of its sub-systems.

In set theoretical terms, the word reality is used in this book to refer to the union of all infinite sets. This assumes that everything finite is itself infinitely complex (e.g., there is an infinite set of points between any two points separated by a finite distance, in time or space). The risk in this definition is that of confining the definition to the aggregate (a kind of monism). Reality involves an explicit (holarchic) existence for all of the real parts—including its subsystems. Thus, categories of parts, such as physical, material, or substantive elements of reality are subdivisions of reality as are categories that include relationships and interactions that are not tangible—to include the mind, the spiritual, cybernetic, and informative.

Therefore, included in the reality being defined here are all processes and forces (e.g., evolution,

predation, emergence, gravity, photosynthesis, magnetism, decomposition, oxidation, feedback, politics, extinction, consciousness, chemical reactions, conversion from energy to matter and matter to energy, dispersal, experience) even though our senses tell us that they do not have the same kind of substantive or physical existence of more material things. They may be of different realms but every realm is part of reality.

Qualities are considered parts of reality so that mass, color, information content, size, and shape are real, as are short-term, or long-term phenomena. Time and space are real parts of reality. History and historical events are real¹ as are our concepts of them, even if those concepts are incorrect. To the extent that things are interconnected, this interconnectedness is part of reality. Duality is part of reality to the extent that things are not so interconnected as to be the same thing, but only if they are not interconnected in reality; separation in space and time are parts of reality as are the connections. Thus, the way reality is experienced by any element/component/part of reality is different from that in the experience of any other component; in this sense everything has its own universe and the union of these universes is reality. The primacy (relative importance or value—both human assigned and actual) of any one thing is included as it is in reality; thus, the importance or reality of ideas, concepts, matter, forces, dynamics, or interactions are what they are (not necessarily what we believe them to be even though our beliefs are real and are parts of reality; every belief is a reality).

To repeat, nothing is excluded from reality as the term is used in this book. If it does not exist or occur, then, by definition, it is not part of the reality defined here (even though a belief in its existence is real but only as a belief); the truth about the past is a reality. The truth about reality is a reality and every belief about reality is a reality. Every point in the universe and every relationship between it and every other point is included. Every subatomic particle and every kind of energy is included. Every process and interaction between all points is included. Every effect and influence is included. Every subset of points is included, as are the relationships, interactions, and the effects of every subset on every other subset (each set involving its

own infinite complexity). Every pattern, category, level of organization, aggregate, piece, and type is included. The reciprocal relationships and influences among all things and all categories (aggregates of things) are included.

Reality is. What is is reality, including the truth and our beliefs about time. Dividing reality into categories is fair—reality consists of parts that fall into categories. Because systemic management is reality-based, and ecosystems are part of reality, systemic management includes ecosystem-based management (along with biosphere-based, and other-component-based management). However, each subdivision is a real part (a reality) and not the ultimate reality meant by the term as used here—which includes all parts. Each part is always a crucial part, for without it within the definition there is denial or ignorance and associated (real) risks. Such denial is real—a real part of reality. The tangibles include things from chemicals and elements to black holes and galaxy clusters and beyond. The mechanics of nature are considered part of reality but only parts, not full reality, nor given more (or less) importance than is realized in reality. The dictionaries of all languages of the world contain various terms used to refer to the parts of reality—falling in categories such as verbs, nouns, and adjectives. One possible exception is the term “God” in cases where this term is defined as ultimate reality so that nothing is excluded. In such cases it would be the reality being defined here and would not be restricted to any part—such as the “mind” in Bateson’s terminology. If any terms are uniquely human constructs (i.e., do not have a counterpart in the remainder of reality), then they are real only as human constructs—but still real as human constructs and have their influence like every other part of reality. The other terms are assumed to have a counterpart (or referent) such that there is something (a reality) to which appearances and perceptions correspond. If humans go extinct, most such parts of reality are assumed to continue to exist, and ultimate reality continues in its altered form. Change is part of reality. Reality is ultimate complexity (see Appendix 3 of Fowler 2003).

Finally, our perceptions of reality (as realities and real parts of reality, including our perceptions

of our perceptions) are all we have to work with. Our minds and the things in them are real. The finite and limited nature of perceptions mean that we can be mistaken—and we are wrong quite often. In the extreme, we encounter situations in which there is no referent in reality for what we think we perceive. This book is about trying to choose, organize, and use our perceptions so as to better define ways that work (develop a form of management that will work). One perception is that of the processes we use in learning and the trial-and-error process of defining what works—things that survive as parts of reality. As individuals, we do this through our own experience, by the experience of others, occasionally expanded to include the experience of various human organizations, and the experience of other species. Various human holons can do the same thing; as individuals, we learn not only from our own experience, but also from that of others. The benchmarking carried out by businesses is an example of learning from experience, and it is possible in comparative studies of communities, cultures, and nations. Carrying this pattern to higher (more inclusive) levels, as done in this book, results in the capacity to define sustainability for our species in a way that accounts not only for ecosystems but complexity in general. The trial-and-error process of defining what works crosses holarchical boundaries to contribute to the emergent patterns that can be appreciated metaphorically as nature's Nash equilibria (Fowler 2008, Fowler and Hobbs 2002). Our models, maps, concepts, and perceptions of these patterns are as close as we can get to informative guidance when the pattern corresponds directly to

(is consonant with) the management question in hand (Belgrano and Fowler 2008).

Note

1. History is obviously not the present—it involves a difference in time. We know, however, that there is a truth about that history, whether or not we accept it, or understand it. We often react to lies regarding the past with comments such as “The reality is, however, that the Soviets caught more whales than they reported”. In this sense, it is the truth that is real; the lie is only real as a lie (there is no other reality with which it bears consonance). The present is a more convincing reality to us (than the past) in that it is all that our senses can respond to; our minds, however, can respond to memories, thoughts, interpretations, emotions, and many other realities within our minds, whether or not there is a matching truth or reality that continues to exist upon our death.

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