A Case Study of Complex Adaptive Systems Theory, Sustainable Global Governance: The Singular Challenge of the Twenty-first Century

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The capacity of biological and ecological systems for self-adaptation or self-organization has been a significant theme in the current life-science academic literature. The article is a case study of complex adaptive systems theory, focusing upon the global political system as a part of a biophysical aggregate system in which we are embedded. I explain why self-adaptation does not explain the global political system at this time and postulate what conditions must be met if it did. Self-adaptation, if it were achieved and maintained in some proximate form, would constitute a phase transition.

Our species’ cumulative actions on the environment (including those generating global warming, environmental pollution, ozone depletion, and biodiversity loss) are the dominant source of the increasing density of causal connectedness between human and natural systems. Given the dramatic rise in the world’s population, technological growth—that affecting industrial practices, life-style behavior, and global trade and investment and military weaponry—is the underlying factor that has driven rising causal interconnectedness. I conjecture that the current density of connectedness constitutes a complexity phase into which humanity has entered. The rapidity with which the banking and economic collapse in the United States proliferated into a global recession contributes to my conjecture. Entering into the complexity phase is a profound non-genetically based evolutionary event with profound consequences. As a consequence, humanity is perilously close to what theoretical biologist Stuart Kauffman has called a “complexity catastrophe,” sharply limiting the capacity for self-adaptation, and in matters of global governance dramatically increasing the degree of difficulty of effective governance.

I focus on the structural properties of the global political system and argue that its anarchic conditions are maladaptive. The anarchic quality of the strong nation system and the aggressive, self-maximizing behavior of the strong nation it generates serve to diminish the possibility of achieving sustainability. Moreover, the justification for aggressive, self-maximizing behavior within the strong nation system is weakened once in the complexity phase, and such behavior and its justification are no longer viable when a related conflict exists or emerges between global security and national security. The signature characteristic of global governance for global problems is that global security takes precedence over national security when a conflict arises.

I maintain that global governance for global problems is a necessary but not sufficient condition for the achievement of sustainable global governance, and is not likely to occur without strong nation advocacy. Sustainable global governance requires, among other things, the development and maintenance of resilience within and between our tightly-coupled human-made and natural systems.