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### **Complex Adaptive Systems and Transition Management**

As our world becomes increasingly complex through its interconnectedness across different levels of scale, it can be argued that the model of complex adaptive systems (CAS) has a better fit with the real world as it stresses the non-linear relationships between scale levels in hierarchical and heterogeneous networks of adaptive agents (Holland, 1995). Consequently, the theory of CAS can be useful in deriving new governance principles for complex problems. The societal application of CAS principles is especially promising in the case of transitions, in which penetrating innovations thrive through the system and eventually change the 'deep structure' of the system, e.g. a fundamental change in the way a societal system is organized to operate, shifting from one relative stable system state to another. The jump between two relative stable system states of a particular societal system requires a multitude of interrelated system innovations. System innovations are organization-exceeding, qualitative innovations, realized by a variety of agents within the system, which fundamentally changes both the structure of the system and the relations between the actors (Rotmans et al. 2003). The resulting emergent patterns reinforce and constrain in turn the development of new operations and thus contribute to changes in the 'deep structure'. Coordination and integration of system innovations is thus one of the main tasks of Transition Management, which aims at giving a certain direction to the transition.

In order to further develop a comprehensive model of transitions and the governance principles of transitions management, we combine the theoretical concepts of complex adaptive systems with empirical case study material. The case study is the transition to integrated water management in the Netherlands (Van der Brugge et. al., Forthcoming). The transition is analyzed in terms of system innovations and actor strategies over the past three decades in order to reveal the mechanisms of transitions in societal systems.