

## **Water Governance in the Anthropocene**

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Panel: Resilience perspectives on the global water challenge

Traditionally water management has been dominated by a command and control paradigm focusing on technical solutions to well defined problems. Whereas this has led initially to significant improvements it became increasingly clear that technical end-of-pipe solutions to isolated problems are not sustainable in the long-term. Since about one decade Integrated Water Resources Management (IWRM) has been promoted as the new paradigm emphasizing integrated approaches and a consideration of all three dimensions of sustainability. However, attempts to implement IWRM have often failed to recognize the need for major structural transformations. Instead of dealing with a multi-objective optimization problem of a system that can be predicted and controlled the systems under consideration are complex and are characterized by non-linear dynamics, threshold behaviour and surprises.

Currently one is observing a shift – at least in discourse - towards a new paradigm of adaptive water governance and management. Such approaches embrace diversity, cross-scale and cross-level interactions, are context sensitive, rely on framing and emergence, and engage actors through learning and collaboration. Such systems are managed for emergence – adaptive capacity and resilience of a social-ecological system are more appropriately described as emergent properties of complex adaptive systems than the result of purposeful design. It is still a major research and policy challenge to develop and implement appropriate concepts and tools to guide processes of self-reflexive and adaptive governance based on a sound understanding of the complex dynamics of social-ecological systems.

To move towards such a new governance and management approach requires a structural transformation in the whole water sector. As consequence of lacking institutional organisation the water sector has to cope with the consequences of policies in other fields. Such coping is no sound strategy for building the foundations for sustainable governance and management of water resources in the long-term. Water is the bloodstream of our planet and has to become a guiding principle in the international climate, energy or economic development debate.