



## Scaling issues in sustainable river basin management

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Sustainable river basin management implies considering the whole river basin when managing the water resources. Management measures target at dividing the water over different uses (nature, agriculture, industry, households) thereby avoiding calamities like having too much, too little or bad quality water. Water management measures are taken at the local level, usually considering the sub-national and sometimes national effects of such measures. A large part of the world's freshwater resources, however, is contained in river basins and groundwater systems that are shared by two or more countries. Sustainable river basin management consequently has to encompass local, regional, national and international scales. This requires coordination over and cooperation between these levels that is currently compressed into the term 'water governance'.

Governance takes into account that a large number of stakeholders in different regimes (the principles, rules and procedures that steer management) contribute to policy and management of a resource. Governance includes the increasing importance of basically non-hierarchical modes of governing, where non-state actors (formal organizations like NGOs, private companies, consumer associations, etc.) participate in the formulation and implementation of public policy.

Land use determines the run-off generation and use of irrigation water. Land use is increasingly determined by private sector initiatives at local scale. This is a complicating factor in the governance issue, as in comparison to former developments of large scale irrigation systems, planning institutions at state level have then less insight on actual water consumption.

The water management regime of a basin consequently has to account for the different scales of water management and within these different scales with both state and non-state actors. The central elements of regimes include the policy setting (the policies and water management strategies), legal setting (national and international laws and agreements), the institutional setting (the formal networks), information management (the information collection and dissemination system), and financing systems (the public and private sources that cover the water management costs). These elements are usually designed for a specific level and are ideally aligned with the other levels. The presentation will go into detail on connecting the different elements of the water management regime between different levels as well as on the overarching governance issues that play a role and will present opportunities and limitations of the linking options.