

Towards risk-based river basin management as an approach to overcome wicked water problems

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INTEGRATED RIVER BASIN MANAGEMENT: A WICKED PROBLEM

The wide range of economic activities and the eco-hydrological complexity of many river basins, in terms of the functioning of the soil–sediment–water system and the links between water quantity, quality and economic activities, make a more integrated management approach to river basins complex and challenging. As the pressures from both anthropogenic and natural causes on environmental systems increase, it is no longer effective or efficient to deal with one issue at a time, since solving a singular problem often causes damaging impacts on other environmental compartments or in other places. We must consider the consequences of our actions on all parts of the environment in an integrated way and configure these actions to cope with an uncertain future (Brils & Harris, 2009).

RISK-BASED MANAGEMENT MAY OVERCOME THE PROBLEM

The challenges described above demand a different approach in order to achieve actual improvement of the ecological quality of our river basins, and thus sustain the goods and services they provide for the well-being of society. Risk-based management is this new approach. It involves the integrated application of three key principles (Fig. 1): be well-informed, manage adaptively and take a participatory approach (Brils & Harris, 2009).

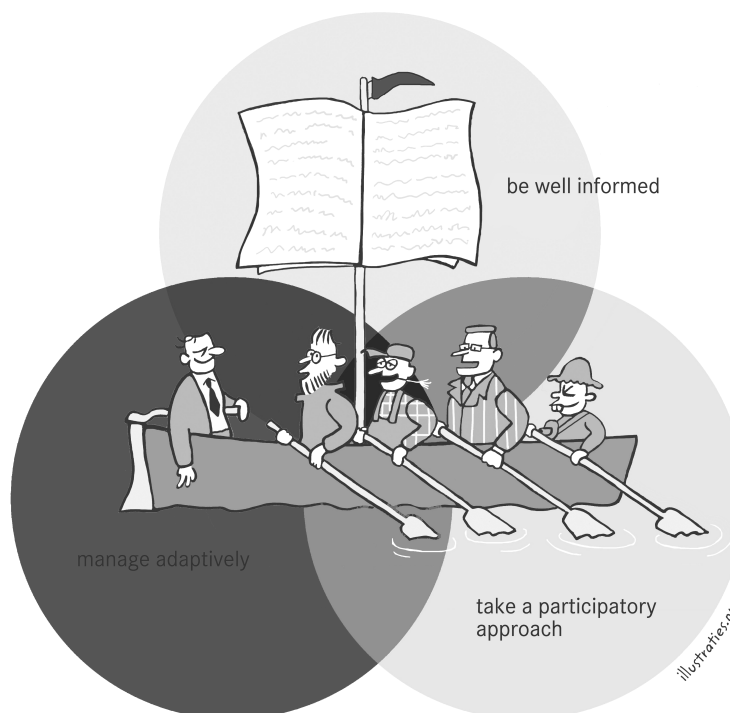


Fig. 1 Risk-based management involves the integrated application of three key principles: be well-informed, manage adaptively and take a participatory approach (Brils & Harris, 2009).

Be well-informed This implies that a sound understanding of the functioning of the soil–sediment–water system (ecosystem) and its interaction with the social system is the basis to river basin management. The first generation of European river basin management plans have only rarely included the state-of-the-art in system understanding. However, the European Water Framework Directive (Annex IV) demands that such understanding should be integrated into the first or subsequent updates of these plans.

Manage adaptively Using our best available understanding on how river ecosystems function will certainly improve river basin management. However, when using scenarios or other tools to frame plausible trajectories of change, uncertainties will always remain. This is intrinsic to social as well as ecological systems. Systems, especially at larger scales, are extremely complex and dynamic and can respond in nonlinear and unexpected ways. We may be able to cope with these uncertainties by applying the concept of adaptive management, characterised as “learning-by-doing” or “learning to manage by managing to learn” (Pahl-Wostl, 2007).

Take a participatory approach Participatory processes involve stakeholders in management and aim to enable them to exchange their views and opinions on problems and bring their knowledge to the table. By learning together to understand the land–water system in a better way, better solutions can be found. This process of social learning requires a common language. The developing ecosystem services approach may provide that language (van der Meulen & Brils, 2008). A common understanding of the value of the goods and services that a healthy ecosystem can provide, and how their present poor status due to our actions can be improved, is the key to a new approach to river basin management.

KEY LESSON

Some examples from practice are already available where integration of the three key principles to risk-based management is attempted. They show very encouraging results and may inspire others. However, it is our conviction that well-designed, coordinated and monitored “learning catchments” (i.e. aimed at stepwise improvement of the effectiveness of measures) are needed to transform our general framework and develop best practice.

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