

Responding to climate change: towards more adaptive water governance systems

Many current problems in water resources management can be attributed to governance failures rather than the resource base itself. Climate change is expected to further complicate water resources management. What features of water governance systems increase the ability to respond to the challenges posed by climate change? To answer this question the Twin2Go project analysed governance systems in 29 case studies from river basins around the world. This briefing paper summarises the main findings and provides recommendations for policy and decision makers in governments and international donor organisations that are involved in or support water governance reforms. The paper stresses that polycentric governance systems and proactive approaches towards addressing uncertainties increase the ability to respond to climate change.

Key Messages

- 1. Polycentric governance systems have a higher capacity to respond to climate change than centralised or fragmented systems.**
- 2. Water resources governance systems that have adopted innovative approaches to take into account existing uncertainties in decision making are also more likely to respond adequately to future climate change.**
- 3. A sound legal and administrative framework for water resources management is a precondition for good performance in water-related adaptation– but it needs to be complemented with sufficient implementation capacity.**

Introduction

Many of today's problems in water resources management can be attributed to governance failures rather than the resource base itself. While *water management* refers to the activities of analysing, monitoring, developing and implementing measures to provide water-related services, and to keeping the state of a resource within desirable bounds, *water governance* refers to the range of political, social, economic and administrative systems that are in place to regulate the development and management of water resources and the provision of water services at different levels of society.¹ Governance thus also refers to the ways in which actors interact across different levels (from local to international) and to how this interplay is steered by various rule-sets, be it formal (e.g. water legislation) or informal (e.g. social norms). In the context of climate change, water governance will increasingly have to face uncertainties that cannot be reduced in the short-term (e.g. uncertainties surrounding precipitation and flow regime, or intensity and frequency of extreme events) and policy decisions that cannot be postponed until better knowledge is available.

Therefore an adaptive governance system will be required that is flexible and robust in the face of uncertainties and inevitable surprises.

Recently, many countries have undertaken water sector reforms, often based on the Integrated Water Resources Management (IWRM) approach. Such reform processes should also include measures to increase the water governance system's capacity to respond to climate change. Moreover, several on-going international policy processes further provide frameworks and opportunities for introducing more adaptive water governance. These include, for example, the formulation of river basin management plans within the scope of the EU Water Framework Directive, the formulation of national IWRM plans according to the Johannesburg Plan of Implementation, the elaboration of adaptation strategies and National Adaptation Programmes of Action (NAPAs), as well as various on-going national efforts to establish river basin management plans.

How can reforms and policy planning processes promote a more adaptive approach in water governance? What governance system features increase the ability to respond to climate change? The Twin2Go project has analysed governance systems in 29 case studies from river basins around the world to answer these questions. The project has developed a method of systematically collecting information and a framework for analysis using 98 indicators to evaluate the important attributes of water governance systems and their performance. The indicators were assessed by groups of case study experts representing science, policy, and practice. Twin2Go then applied quantitative and qualitative methods for a comparative analysis of how the structure of the water governance regime affects the performance of water resources management while taking into account environmental and socio-economic contexts.

With regards to climate change adaptation, Twin2Go studied which governance system characteristics support: the generation and adoption of knowledge and awareness about adaptation needs and options; the implementation of adaptation plans including soft measures (such as education and public awareness programmes) as well as hard measures (infrastructure, such as dikes); and the adoption and coordinated implementation of an adaptation strategy that incorporates the water sector.

Lessons Learned

Polycentric governance systems are more adaptive than centralised and fragmented systems

The Twin2Go analysis clearly shows that polycentric systems are more likely to perform well with regards to climate change adaptation. Polycentric systems are characterised by decentralised decision making – where functions, responsibilities and authorities are allocated to various levels of administration – but also by effective vertical (across administrative levels) and horizontal (across sectors and geographical areas) coordination and a sound balance between bottom-up and top-down processes. Mere decentralisation without coordination results in fragmentation with negative impact on performance. Moreover, polycentric governance structures were found to not only increase performance with regards to (expected) climate change, but also with regards to good governance, i.e. implementation of principles such as participation, transparency, effectiveness, equity and inclusiveness in practice. The table on the next page highlights the differing characteristics of several types of governance systems.

Water governance systems that have adopted innovative approaches to take into account existing uncertainties into decision making are also more likely to perform well with regards to climate change adaptation

There are several aspects to including uncertainties into decision making in river basin management: first, uncertainties do not only exist with regards to climate change in the future, but also related to present climate variability and socio-economic developments such as population growth and urban development. Second, uncertainties are not always quantifiable. Variability can be quantified in certain areas, for instance in hydrological parameters; however uncertainties related to, for example, the social acceptance of water resources management options, such as dams or water tariffs, will often be difficult to express in numbers. Nevertheless, these aspects can significantly affect the success of management decisions. In short, the more water governance and water management practices take into account different kinds of uncertainty today, the better will the governance system be able to address uncertainties related to future climate change.

One way to deal with uncertainties is to favour reversible and flexible options wherever uncertainties exist about important boundary conditions (including environmental and socio-economic conditions). Opting for measures that are flexible enough to be adjusted to changing conditions or new knowledge can significantly reduce the cost of making wrong decisions. Soft measures, such as capacity building, legal provisions, or behavioural and managerial changes, are often easier to update and revise than hard measures such as seawalls and other major large-scale infrastructure. Flexible measures indeed are essential for implementing adaptive management practices. Finally, scenarios are a good tool to consider uncertainties in decision making in water resources management. Using multiple scenarios should provide a long-term perspective and show several options for potential future development.

A sound legal and administrative framework for water resources management is a necessary – but not sufficient – precondition for good performance in water-related adaptation

A well-developed institutional framework for water resources management, including legislation that explicitly deals with the water sector as well as an autonomous administration to develop and implement domestic water policy, increases the capacity to adequately respond to climate change. A sound legal framework should recognise the public character of water but also provide for the protection of user rights in order to create a favourable environment for investment and economic development, as well as for ecological sustainability. Other principles commonly promoted in water resources management, such as good governance and IWRM are also related to improved performance of water resources management with regards to climate change adaptation.

However, the mere existence of an elaborate legal framework is not sufficient to ensure good performance in the context of adaptation to climate change. While a sound legal framework was in place in all the case studies where good adaptation performance was observed by Twin2Go – there were also quite a few examples with a well-developed legal framework but poor performance. A likely reason for this is that other necessary conditions for implementing and enforcing the legal framework need to be provided, including human capacities, financial resources, and absence of corruption.

Characteristics of different types of governance systems

	<i>Polycentric</i>	<i>Fragmented</i>	<i>Centralised</i>
<i>Distribution of formal power</i>	<i>High</i>	<i>High</i>	<i>Low</i>
<i>Multi-level distribution of functions and resources</i>	<i>High</i>	<i>High</i>	<i>Low</i>
<i>Vertical coordination/cooperation</i>	<i>High</i>	<i>Low</i>	<i>Low</i>
<i>Horizontal coordination/cooperation</i>	<i>High</i>	<i>Low</i>	<i>Low</i>

Recommendations

The Twin2Go analyses show that no simplistic prescriptions for governance reform exist. However, there are some general guiding principles that help improve the ability of water governance systems to respond to climate change – the implementation of which should be tailored to specific societal and environmental conditions. Against this background, policy and decision makers of national governments and international donors should take into account the following recommendations in their efforts to integrate climate change adaptation in water sector reforms, IWRM plans, and water related adaptation strategies:

- **Promote polycentric structures in water governance: distribute functions, responsibilities and authority among different administrative levels, including local, basin, provincial and national, while at the same time providing platforms for effective coordination across these administrative levels and across sectors.**
- **Provide procedures and practices for the proactive consideration of uncertainties in decision making, e.g. through the use of multiple scenarios and applying flexible management options that can be adjusted to changing circumstances.**
- **Strengthen capacities at all administrative levels in order to take over functions and responsibilities in responding to climate change, especially in dealing with uncertainties.**
- **Promote the effective implementation of legal frameworks as well as good governance and IWRM principles, by developing the necessary human and administrative capacities and providing financial and technical resources.**

Imprint

This policy brief was compiled by adelphi based on a report from the Twin2Go project.² Twin2Go was designed to review, consolidate, and synthesise research on adaptive and integrated water resources management in basins around the world.³ Together with experts and stakeholders from these basins, the project drew insights relevant to policy and research on issues around adaptive water governance in the context of climate change and studied to what extent they are transferable to other basins. Twin2Go was funded as a Coordination Action under the European Commission's 7th Framework Programme from June 2009 until September 2011.

References:

- ¹ GWP 2004: Catalyzing Change: Handbook for developing IWRM and water efficiency strategies. Stockholm: GWP.
- ² D'Haeyer, Knieper, Lebel, Pahl-Wostl [eds.] (2011): Synthesis Report. Context-Sensitive Comparative Analysis of Associations between Water Governance Properties and Performance in Water Management.
- ³ See the Twin2Go website www.twin2go.eu for further project downloads, including River Basin Questionnaires, Best Practice Guidelines, and Policy Briefs

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