

D. 1.3: Methods for Comparative Analysis

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Twin2Go Coordinating twinning partnerships towards more
Adaptive governance in river basins

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1 Some general considerations related to water governance

Water governance refers to the range of political, social, economic and administrative systems that are in place to regulate development and management of water resources and provisions of water services at different levels of society (UNDP, 2000).

The evolution in the discourse from “government” to “governance” implies a change in thinking about policy processes. The notion of government as the single decision-making authority, where state authorities exert sovereign control over the people and groups making up civil society, has been widened by the notion of multi-level, polycentric governance where many actors in different institutional settings contribute to policy development and implementation (Mayntz, R., 1998). ‘Governance’ takes into account the increasing importance of modes of governing, where non-state and private corporate actors and networks participate in the formulation and implementation of public policy or develop policy instruments that co-exist with existing government policy processes. A major challenge is to understand how all these different processes in concert determine certain policy outcomes, including actual water management practices, how change in governance regimes occurs, and what is required to meet the normative principles of good water governance. According to UNDP “good water governance” is characterized by being: *participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive, and following the rule of law.*

Pahl-Wostl (2009) summarized major challenges for water governance: *Governance failures are manifold and affect both developing and industrialized countries albeit in different ways. In many developing countries corruption and the absence of civil society, a lack of efficiency and effectiveness of existing governance structures pose problems for any kind of development – not only for resource governance. Basic human needs are not satisfied for large parts of the population. In contrast, many industrialized countries suffer from over-regulation by rigid bureaucracies, sectoral fragmentation and a prevailing dominance of economic over environmental considerations. Despite starting from quite different initial conditions the resource governance challenge displays similarities: how to implement sustainable resource governance and management regimes that are resilient to global and climate change? Being resilient implies that basic functions of a regime are sustained despite of short-term disturbance or long-term societal or environmental changes.*

Correspondingly attention has shifted towards an improvement of our understanding of the requirements for sustainable resource governance in changing environments (Dietz et al 2003; Folke et al, 2005; Pahl-Wostl, 2007a,b; Armitage, 2008). Adaptive governance and social learning have been identified as essential for governing social-ecological systems during periods of abrupt change (Folke et al, 2005; Pahl-Wostl, 2007b). The ability of governance systems to deal with uncertainty

and surprise is an essential requirement for their sustainability in times of increasing uncertainty due to climate and global change. However, our knowledge about the relationship between characteristics of resource governance regimes and their performance and the nature of their dynamics is still quite limited.

2 Purpose of the comparative exercise

The methods to be used and issues to be addressed by Twin2Go depend on the purpose of the comparative exercise. One can here distinguish between

- Assessment of the performance of current governance regime
- In depth analyses of governance regimes and dependencies of different factors

Whereas the first exercise aims at an assessment of the current state the second approach has the ambition to derive general insight on causalities and factors that lead to the current state.

Another distinction is between

- Focus on specific processes/factors and their influence on the water governance regime (e.g. influence of water price or role of corruption)
- Systemic approaches that try to analyze different regime configurations and their performance under different contextual conditions (see Table 1).

The purpose of the comparative analysis of Twin2Go is an assessment of the performance of governance regimes with the focus on adaptation to climate change. The assessment should be linked to an analysis of the factors that determine success or failure and the potential transferability of insights from one basin to others.

Hardly any comparative analyses of governance regimes of similar scope exist. A notable exception is given by the work from Saleth and Dinar (2004) who made a comprehensive cross-country analysis of the performance of water policy reforms using an institutional economics framework.

3 Essential elements of a comparative framework

This section summarizes essential dimensions that need to be addressed to be able to make a comparison of governance regimes. For the purposes of the analysis in Twin2Go a distinction is made between performance, water governance regime and context as sketched in Figure 1.

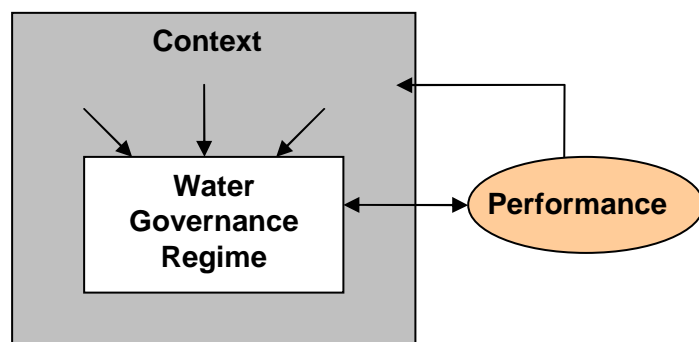


Figure 1: Analytical framework making a distinction between performance- water governance regimes - context.

The context in which a water governance regime is embedded has a strong influence in the regime and its performance. Hence similar institutional reforms may lead to quite different outcomes as a consequence of the context. To move away from simplistic panaceas context variables need to be taken into account. Regarding the governance regime the focus is mainly on structural characteristics whereas the performance is emphasizing the process dimension – e.g. formal institutions prescribing universal and non-discriminatory access to safe drinking water are part of the regime, whereas the actual extent of equitable and inclusive access is part of the performance.

3.1 Water governance regime

In the scientific literature one finds a whole range of different approaches to conceptualize governance. Treib et al (2005) classified the major streams according to whether governance is seen as belonging primarily to the realms of politics, polity or policy. Related to the politics dimensions governance emphasizes the way of policy making, how different preferences are translated to effective policy choices and different interests are transformed to unitary action (Kohler-Koch, 1999). Other governance approaches more closely related to the polity dimension focus on an institutionalist approach and conceive of governance as a system of rules that shape the action of actors (e.g. Rosenau, 1995; Ostrom, 2005). Finally governance may also be defined as modes of political steering and refer thus primarily to the policy dimension (e.g. Héritier, 2002). It may be useful from an analytical perspective to make a distinction between these dimensions. However,

such distinction may not do justice to the complexity of real-world governance regimes. It may be virtually impossible to determine what is the dependent and what is the independent variable. In particular the politics and polity dimensions cannot be separated. In their analytical approach of an actor centered institutionalism Mayntz and Scharpf (1995) combine an actor centred and an institutionalist approach. An encompassing approach to resource governance as presented by the UNDP definition on water governance embraces all dimensions. More and more scholars promote an encompassing concept of governance doing justice to the complexity of societal dynamics and as a concept bridging social science disciplines (e.g. Kooiman, 2000; Benz, 2004; Schuppert, 2006). Pahl-Wostl (2009) presented an approach for resource governance that follows similar lines of reasoning. To deal with the complexity of governance systems in more systematic fashion Pahl-Wostl (2009) introduced the following three dimensions as base for analyzing the characteristics of environmental governance regimes:

- Institutions and the relationship and relative importance of formal and informal institutions;
- Actor networks with emphasis on the role and interactions of state and none-state actors and power relationships.
- Multi-level interactions across administrative boundaries and vertical integration across levels and horizontal integration across sectors;

These dimensions allow characterizing important properties of governance regimes such as the importance of difference governance modes with regard to the role, nature and interaction of bureaucratic hierarchies, markets, and networks. Another important characteristic is the degree of centralization.

3.2 Context

The characteristics of the societal and environmental context are assumed to have a strong influence on the nature of a water governance regime and its performance. The following factors offer a first compilation of variables that were refined during the development of the methodology:

Societal dimension

- State of societal development as indicator for available capacity (e.g. measured by the Human Development Index)
- Social sustainability (e.g. Gini Index as indicator for extent of inequality of basic assets)
- Economic sustainability (e.g. GDP related measures)
- Effectiveness of formal institutions (e.g. measured by the Corruption Perception Index)
- Consideration of good governance principles in legislation at national level.

Environmental dimension

- Water availability and its variability

- Climate
- Degree of Human Influence
- Water Quality

3.3 Performance

Measures for a governance regime performance should allow assessing and evaluating the degree of satisfaction with the current state of the regime.

Obviously a governance regime should achieve its stated goals. Failure of doing so is a clear sign of a non-satisfactory performance without alluding to any normative claims. For purposes of better comparability across the case studies progresses in achievements of the water related Millennium Development Goals were chosen as indicators.

The following performance measures are based on normative principles regarding governance processes:

- Fulfillment of good governance principles as indicators for the process dimension.
- Stakeholder participation

The ability to respond to the challenges of climate change is a more recent development. It is an indicator for the response to a specific challenge and a measure for the adaptive capacity of a regime. Here no generally agreed principles on how to assess the response to climate change exist yet.

4 Characteristics of comparative methods

A diverse range of methods have been, or potentially could be, used to compare water governance regimes. In Table 1 one possible typology of methods is given. At the highest level the main distinction is between methods which aim to provide insight into one or just a few variables or relationships, like the effects of water pricing on irrigation efficiency (e.g. Saleth and Dinar 2004, Meinzen-Dick 2007), and more systemic analyses of governance. For completeness some distinctions for specific methods are shown but they will not be considered further here, as our primary interest is in systemic assessments of governance regimes.

Systemic approaches can be divided into four groups (Table 1). In structural approaches diagrams of relationships are core analytical products. These may describe relationships between actors, organizations, institutions or in more complex versions (systems method) several components of the water governance system. The NeWater project, for example, developed the elaborate Management and Transition Framework (MTF) for describing activities in a water system including analyzing management activities and governance regime (Pahl-Wostl et al. 2007, Pahl-Wostl 2009).

In dynamic approaches timelines or storylines of change play a special role. Transition approaches focus on changes in a place, typically institutional reforms, such as the introduction of river-basin or other organizations (van der Brugge et al. 2005), new infrastructure (Foran and Manorom 2009) or new flood plain policy (Meijerink 2005, Sendzimir et al. 2008, Werners et al. 2009). Pathway approaches are more suitable for comparing changes process among places. A good example of the latter is the recent book about policy entrepreneurs which in the synthesis chapter explores lessons from 13 transitions in river basins (Huitema & Meijerink 2010). Another analysis is being prepared using this style in the ASEM project.

Contextual approaches are probably the most common method. They compare a few places (or cases) by applying the same framework, usually a set of questions, to each regime. The answers to the questions are often context-sensitive and complex, so qualitative methods of analysis are essential. The IFA project, for example, used a set of questions around the conventional phases of the disaster cycle to ask less conventional questions about political and institutional issues (Lebel et al. 2006). Another example is the comparison of the Rhine and Mekong (Myint 2003), Murray-Darling and the Mekong (Chenoweth et al. 2002), eight basins (Blomquist et al. 2005) and of international water treaties (Ma et al. 2008). In some instances analysis is carried out on prior narrative work which is not organized in a form conducive to question-by-question analysis. In this case less emphasis may be given to a set of specific questions and more to very broad questions about how regime characteristics interact and co-evolve. We call this the narrative method. Several of the chapters in the M-POWER project took this approach (Lebel et al. 2007, Molle et al. 2009).

Indicator approaches are usually semi-quantitative. At a minimum they focus on the presence/absence of a large number of governance attributes sometimes calculating aggregate indices based on these. We call this the checklist method. If for many of the regime attributes more nuanced levels are recognized then we called it the scorecard method. The ASEM WaterNet project, for example, developed a scorecard method (Huntjens et al. 2009). In Thailand a results-based monitoring and evaluation system for plans and strategy development in newly emerging river basin and river sub-basin organizations also used a scorecard type approach (Thomas 2006).

Table 4: Typology of methods used to compare governance regimes

Typology of comparisons			What is compared
Specific variables	Quantitative	Meta-analysis	Values of a particular governance attribute or describing an attribute's relationship with performance for well-defined set of cases
		Survey	As above but non-systematic selection of cases (i.e. weak inclusion/exclusion or search criteria)
	Qualitative	Systematic review	Descriptions of a particular governance attribute or relationship with performance for well-defined set of cases
		Unsystematic review	As above but non-systematic selection of cases
Systemic	Structural	Social networks	Diagrams of actor relationships (e.g. power, influence, authority, communication)
		Organizational	Diagrams of responsibilities and accountability relationships compared
		Systems	Diagrams of governance and other water system components
	Dynamic	Transitions	Set of variables about same place at different times (e.g. reform process)
		Pathways	Pathways of change in different places
	Contextual	Questions	Responses to a common set of analytical questions
		Narrative	Integrated descriptions of a governance regime
	Indicator	Checklist	Presence/absence of governance attributes
		Scorecard	Ordinal scale measure of governance attributes

Methods used to compare water governance regimes differ on dimensions apart from those highlighted in the typology in Table 1. For example, they also differ in terms of who makes the

analysis, or whose knowledge is used for an assessment. Some approaches are entirely driven by the judgments and understanding of the researcher(s) whereas other methods are explicitly designed to elicit understanding of several experts or a wider body of stakeholders. Another important dimension by which comparative methods differ, articulated under the specific methods in Table 1 but not explicit under the systemic methods is the strictness of inclusion and exclusion criteria for selecting cases. Comparing very different regimes or largely similar ones that differ in a big way on just a few attributes has different implications for analytical power on the one hand, and generalizability, on the other. Finally applications of comparative methods differ in quality, which might be measured by things like: reproducibility of findings, explanatory power of arguments, and practical significance of issues being addressed.

Based on these considerations one can state some requirements for the knowledge base and for the comparative method to be used for the purposes of Twin2Go:

The method must be able to cope with the heterogeneity of the cases and correspondingly the heterogeneity of the issues addressed and methods used. This excludes quantitative comparisons based on surveys or meta-analyses. Furthermore the questions addressed in Twin2Go ask for a systemic approach rather than an emphasis on specific variables. The method that seems to be most robust towards heterogeneity in data and the need to fill knowledge gaps are indicators – checklist and/or score cards.

This does not have to exclude that more elaborate approaches may be used for dealing with specific issues in a subset of cases that fulfill more stringent requirements regarding comparability and data availability.

5 Versions of the Twin2Go questionnaire

A questionnaire for comparative analyses and a related guidance document were developed by all Twin2Go partners based on the considerations above. The original version was adjusted twice during the course of the project.

5.1 Version 1

The original version 1 comprises 86 indicators in the three sections *Water Governance Regime*, *Context* and *Performance*. This version was used for data collection within the scope of the series of Case Study Review Workshops (see Twin2Go deliverable 2.1).

5.2 Version 2

After case study data had been collected within the scope of the Case Study Review Workshops, the Twin2Go consortium explored approaches for the analysis of the case study data. Experiences with regard to data collection and explorative analyses were then discussed during the Synthesis Workshop (see Twin2Go deliverable 2.2). The consortium agreed that the comparative analysis would benefit from further indicators, which primarily address the state of the water resources and the environment as well as environmental management practice. As a consequence, the consortium developed version 2 of the questionnaire and the related guidance document, which comprise the following new indicators (Table 5):

Table 5: Indicators that were added to the questionnaire in version 2

No.	Indicator
67.a	Sub-Basin Size
67.b	Transboundary
87.	Aquatic biodiversity
88.	Invasive exotic species
89.	Surface and groundwater quality
90.	Groundwater use
91.	Water Exploitation Index (WEI)
92.	Water allocated for aquatic ecosystem
93.	Water pollution incidents
94.	Water quality monitoring
95.	Hydro-meteorological monitoring - levels
96.	Level of understanding of groundwater resources

Case study data for these additional indicators were subsequently collected as a basis for a comparative analysis of associations between water governance characteristics and performance given different environmental and socio-economic contexts (see Twin2Go deliverable 2.3).

5.3 Version 3

Twin2Go developed a web database, which allows collecting data about further case studies as a basis for refined future analyses (see Twin2Go deliverable 4.2.2). To this end, indicators that had not been considered in the comparative analysis were removed from the questionnaire, resulting in version 3 of this document and the related guidance document (Table 6). Furthermore, a couple of other adjustments (e.g. with regard to explanations, definitions and data sources) were carefully made to ensure comparability with the previous versions.

Table 6: Indicators that were removed from the questionnaire in version 3

No.	Indicator
9.	Formalised transboundary coordination organisation
12.	Financing mechanisms: Degree of investment from private sector/ public/ other sources (e.g. international)
22.	Presence of substituting informal institutions for management of water
23.	Presence of complementary informal institutions for water management
27.	Is universal and non-discriminatory access to safe drinking water and sanitation a goal?
28.	Integration of wetlands in IWRM and IRBM
49.	Presence of avenues of dissent – press freedom, freedom of speech
54.	Predictability – with regard to IWRM and climate change
55.	Köppen-Geiger climate classification (river basin)
56.	Climate Moisture Index
57.	Climate Moisture Index Coefficient of Variation
63.	Climate Vulnerability Index
64.	Degree to which water quality status restricts usability of users' types
67.	Uncertainty associated to climate change predictions regarding precipitation in the basin
67.b	Transboundary
78.	Predictability – with regard to IWRM and climate change
91.	Water Exploitation Index (WEI)

6 List of references

- Armitage, D. 2008. Governance and the Commons in a multi-level world. *International Journal of the Commons* 2, 7-32.
- Benz, A. 2004. Einleitung: Governance – Modebegriff oder nützliches sozialwissenschaftliches Konzept? In: Benz, A. (editor), *Governance – Regieren in komplexen Regelsystemen: Eine Einführung*. VS Verlag für Sozialwissenschaften, Wiesbaden, Germany, pp. 11-28.
- Blomquist, W., Dinar, A., and K. Kemper. 2005. Comparison of institutional arrangements for river basin management in eight basins. *World Bank Policy Research Working Paper* 3636. The World Bank, Washington D.C.
- Chenoweth, J. L., Ewing, S., and J. Bird. 2002. Procedures for ensuring community involvement in multijurisdictional river basins: A comparison of the Murray-Darling and Mekong River basins. *Environmental Management* 29:497-509.
- Dietz, T., Ostrom, E., and P. Stern 2003. The struggle to govern the commons. *Science* 302, 1907–1912.
- Folke, C., Hahn, T., Olsson, P., and J. Norberg 2005. Adaptive Governance of Social-Ecological Systems. *Annu. Rev. Environ. Resour.* 30, 8.1-8.33.
- Foran, T., and K. Manorum. 2009. Pak Mun Dam: Perpetually Contested? In: Molle, F., Foran, T. and M. Kähkönen (editors). *Contested Waterscapes in the Mekong Region: Hydropower, Livelihoods and Governance*. Earthscan, London, pp 55-80
- Héritier, A. 2002. New Modes of Governance in Europe: Policy-Making without Legislating? In: Héritier, A. (editor). *Common Goods: Reinventing European and International Governance*. Lanham, Md., Rowman & Littlefield Publishers, pp. 185-206
- Huitema, D., and S. Meijerink (editors) 2010. *Water Policy Entrepreneurs. A Research Companion to Water Transitions around the Globe*. Edward Elgar Publishing/IWA Publishing.
- Huntjens, P., Sombardier, A., Freissinet, C., Aekeraj, S., and J. Duarte. 2009. Obstacles and opportunities for stakeholder participation in water management decision-making - experiences from France, Portugal and Thailand. *ASEM Waternet Joint Working Paper*.
- Kohler-Koch, B. 1999. The Evolution and Transformation of European Governance. In: Kohler-Koch, B. and R. Eising (editors). *The Transformation of Governance in the European Union*. Routledge, London, UK. Pp. 14-35.
- Kooiman, J. 2000. Societal Governance: Levels, Models and Orders of Social-Political Interaction. In: Pierre, J. (editor). *Debating Governance: Authority, Steering, and Democracy*. Oxford University Press, Oxford, UK. Pp. 138-164.

- Lebel, L., Dore, J., Daniel, R., and Y. S. Koma (editors). 2007. Democratizing water governance in the Mekong region. Mekong Press, Chiang Mai.
- Lebel, L., Nikitina, E., Kotov, V., and J. Manuta. 2006. Assessing institutionalized capacities and practices to reduce the risks of flood disasters. Pages 359-379 in Birkmann, J. (editor). Measuring Vulnerability to Natural Hazards: Towards Disaster Resilient Societies. United Nations University Press, Tokyo.
- Ma, J., Hipel, K. W., De, M., and J. Cai. 2008. Transboundary water policies: assessment, comparison and enhancement. *Water Resources Management* 22:1069-1087.
- Mayntz, R. 1998. New Challenges to Governance Theory, Jean Monet Chair Papers No. 50, European University Institute.
- Mayntz, R., and F.W. Scharpf. 1995. Der Ansatz des akteurszentrierten Institutionalismus, In: Mayntz, R., and F.W. Scharpf, (editors). *Gesellschaftliche Selbstregulung und politische Steuerung*. Campus-Verlag, Frankfurt a.M., Germany. Pp. 39-72
- Meijerink, S. 2005. Understanding policy stability and change. The interplay of advocacy coalitions and epistemic communities, windows of opportunity, and Dutch coastal flooding policy 1945-2003. *Journal of European Public Policy* 12:1060-1077.
- Meinzen-Dick, R. 2007. Beyond panaceas in water institutions. *Proceedings of the National Academy of Sciences* 104:15200-15205.
- Molle, F., T. Foran, and M. Kakonen (editors). 2009. Contested waterscapes in the Mekong Region: Hydropower, Livelihoods and Governance. Earthscan, London.
- Myint, T. 2003. Democracy in global environmental governance: issues, interests, and actors in the Mekong and the Rhine. *Indiana Journal of Global Legal Studies* 10:287-314.
- Ostrom, E. 2005. *Understanding Institutional Diversity*. Princeton University Press.
- Pahl-Wostl, C., Moeltgen, J., Ebenhoeh, E., and G. Holtz. 2007. The NeWater management and transition framework - state and development process. Pages 75-96 in Pahl-Wostl, C., Kabat, P., and J. Moeltgen (editors). *Adaptive and integrated water management: coping with complexity and uncertainty*. Springer Verlag.
- Pahl-Wostl, C. 2007a. Transition towards adaptive management of water facing climate and global change. *Water Resources Management* 21(1), 49-62.
- Pahl-Wostl, C. 2007b. Requirements for Adaptive Water Management. In: Pahl-Wostl, C., Kabat, P., and Moeltgen, J. (editors). *Adaptive and Integrated Water Management. Coping with Complexity and Uncertainty*. Springer Verlag, Heidelberg, Germany. Pp. 1-22.
- Pahl-Wostl, C. 2009. A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes. *Global Environmental Change*, 18: 354-365. DOI: <http://dx.doi.org/10.1016/j.gloenvcha.2009.06.001>.

- Rosenau, J.N. 1995. Governance in the 21st Century. *Global Governance*, 1: 13-43.
- Saleth, R.,M., and A. Dinar. 2004. *The Institutional Economics of Water. A Cross-Country Analysis of Institutions and Performance*. Elgar Publisher, 398 pages.
- Schuppert, G.F. 2006. Governance im Spiegel der Wissenschaftsdisziplinen. In: Schuppert, G.F. (editor). *Governance Forschung: Vergewisserung über Stand und Entwicklungslinien*. Nomos Verlag, Baden-Baden, Germany. Pp. 371-469.
- Sendzimir, J., Magnuszewski, P., Flachner, Z., Balogh, P., Molnar, G., Servari, A., and Z. Nagy. 2008. Assessing the resilience of a river management regime: informal learning in a shadow network in the Tisza River basin. *Ecology and Society* 13:11. [online] URL: <http://www.ecologyandsociety.org/vol13/iss11/art11/>.
- Thomas, D. E. 2006. Results measurement framework for pilot sub-basins. Office of Natural Resources and Environment Policy and Planning, Ministry of Natural Resources and Environment, Bangkok.
- van der Brugge, R., Rotmans, J., and D. Loorbach. 2005. The transition in Dutch water management. *Regional Environmental Change* 5:164-176.
- Werners, S., Flachner, Z., Matczak, P., Falaleeva, M., and R. Leemans. 2009. Exploring earth system governance: A case study of floodplain management along the Tisza river in Hungary. *Global Environmental Change*, 19, 503-511.

7 Annex

The three versions of the questionnaire and related guidance document are attached as separate files to this report.