Water governance benchmarking: concepts and approach framework as applied to Middle East and North Africa countries

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Abstract

The world water crisis is a crisis of governance, as has been aptly stated. Yet how does one solve a crisis of governance? Water governance comprises complex nested and interlocked sets of decisions about water. It is inherently political, and is ultimately the responsibility of national, regional and local governments, working with their own citizens and with each other, to make improvements. In this context, there is a critical need in nearly every country to assess whether current water governance structures and practices are suitable and are delivering the desired results and, if not, where they fall short. When such assessments are made regularly and for several countries, it is possible to compare water governance status and performance both among countries and in a single country over time. This paper presents an approach to establishing a system of benchmarking water governance from content analysis of official policy and legal documents and a stratified set of stakeholder opinion panels. The approach assesses both the functions involved in water governance and the processes employed in making decisions. Six countries of the Middle East and North Africa (MENA) region (Egypt, Jordan, Morocco, Oman, Turkey and Yemen) comprise a case study to show how this approach works.

Keywords: Assessment; Benchmarking; Governance; Indicator; MENA; Water resources

1. Introduction

Water is an essential natural resource that shapes regional landscapes and is vital for ecosystem functioning and human well-being. At the same time, water is a resource under considerable pressure. Alterations in the hydrologic regime due to global climatic, demographic and economic changes have serious consequences for people and the environment. Recent international water congresses (e.g. World Water Week, 2012; 6th World Water Forum, 2012; RIO +20, 2012) and publications (Rogers & Hall, 2003; Solanes & Jouravlev, 2006; Hill *et al*., 2008; Pahl-Wostl *et al*., 2008a; OECD, 2011, 2012; UNEP, 2012) have stressed the importance of water governance in determining a country's ability to deal with future water challenges. In fact, many have now aptly stated that the world water crisis is a crisis of governance, not one of scarcity. Yet how does one solve a crisis of governance?

Water governance comprises complex nested and interlocked sets of decisions about water (Scholz & Stiftel, 2005; Pahl-Wostl *et al.,* 2008b; Kante, 2011). Although it has technical aspects, it is an inherently political rather than technocratic issue. As such, it is ultimately the responsibility of national and regional governments, working with their own citizens and with each other, to make improvements (Roberts, 2003). International bodies can help by providing advice and support, but ultimately decisions about policies, laws, institutional structure, incentives and capacity development must be made by national and local authorities and their constituents (Durant *et al*., 2004). In this context, there is a critical need in nearly every country to assess whether current water governance structures and practices are suitable and are delivering the desired results and, if not, where they fall short (Conca, 2006). In a globalized world, such national assessments can clearly benefit from comparisons across countries and time (Dinar & Saleth, 2005) but for this to happen an approach for measuring and characterizing the capacity for and quality of water governance across countries and an on-going system for regular and independent measurement and reporting must be developed. When such an approach is implemented for a number of countries and at regular intervals, it is possible to compare water governance status and performance both among countries and in a single country over time (Conca, 2006). Openly disclosed, such comparative information can stimulate discourse and allow countries to track progress and to identify areas in which they lag and excel (Ahmed & Rafiq, 1998; Dattakumar & Jagadeesh, 2003; De Witte & Marques, 2010; UNDP, 2013).

This paper lays out an approach to establishing a system of benchmarking water governance, applied to a set of Middle East and North Africa (MENA) countries, drawing on research done in 2008–10 and reported in Svendsen (2010). It reviews and defines concepts of *governance*, *policy*, *management* and others, and presents a strategy for assessing water governance based on essential *water functions* and characteristics of *governance decision-making processes*. In contrast with other assessments of governance, our approach recognizes that both processes and functions need to be assessed in tandem, as one can easily imagine a situation where decision-making processes are laudably participatory and transparent while the resulting decisions fail to address the issues at hand. The paper proposes a three-tiered framework defining the structural capacity[1] for effective water governance – *policies*, *laws* and *organizations* – and, based on it, outlines an approach for measurement and assessment using content analysis of policy and legal documents and a set of stratified stakeholder perception panels. The paper concludes

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[1] 'Structural capacity', in our view, comprises laws, policies and organizational structure, but not the capacities of the human actors who populate the system. It is thus different from institutional capacity.

with an overview of the results obtained in applying this approach to six MENA countries (Egypt, Jordan, Morocco, Oman, Turkey and Yemen) and highlights application and policy lessons learnt from the trials in those countries.

2. The concept of water governance

Much confusion abounds over the meaning of the terms *governance* in general and *water governance* in particular (see for instance Tropp (2007) and Lautze *et al.* (2011)). To advance the discussion of these important topics, and to define them operationally so that assessment and measurement can take place, it is necessary to be clear about their meanings. There are two important considerations that need to be addressed in achieving this clarity.

The first of these is the nature of governance itself. The Global Water Partnership (GWP) defines governance in terms of sets of systems in different disciplinary realms (Rogers & Hall, 2003). Others conceive of governance even more broadly as 'the sum total of processes, mechanisms, systems and structures' (Shah & van Koppen, 2008). While useful conceptually, these approaches do not directly provide sufficient detail to begin operationalizing the definition. An alternative approach considers governance more specifically as 'the exercise of authority'. The United Nations Development Programme (UNDP) defines governance as 'the exercise of economic, political, and administrative authority to manage a country's affairs at all levels' (UNDP, 1997). The World Bank adds the notion of acquiring authority to that of exercising it ('the manner in which public officials and institutions acquire and exercise the authority to shape public policy and provide public goods and services'; World Bank, 2007). Kaufmann & Kraay (2008) also suggest that most definitions of governance emphasize the importance of a capable state that is accountable to citizens and operates under the rule of law. This addition emphasizes the importance of decision-making processes. This more specific approach is the one adopted and built upon here.

A second important choice that must be made is over the scope of the actions to be included in the definition of water governance. Some scholars include the full range of decisions made in managing water, from policy-setting to service delivery, in their discussion of water governance (UNDP, 2013). Others see it as comprising only the higher-level decisions that establish the context for day-to-day decision-making (WWAP, 2003). As such, governance encompasses decisions on sectoral policies and the overall organizational architecture of the sector but does not extend to routine administrative decision-making. This approach separates top-level decision-making processes (governance) from applied operational decision-making (management). We take this more restricted view in our analysis, separating governance from management[2]. This restricts the analysis to a smaller subset of all the decisions which are made about water.

These considerations lead to the following definition, which we employ in the present framework: *water governance is the manner in which authority is acquired and exercised on behalf of the public in developing, utilizing and protecting a nation's water resources.* This definition can operate at various levels, from national to local, and can also encompass informal governance based on local tradition, as with the authority of a village headman or a traditional water master.

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[2] In addition to its use in referring to decision-making in the public sector, the term governance is sometimes applied to private sector organizations, as in corporate governance. In this usage, the reference is usually to higher-level decision-making at what might correspond to the corporate policy level. Thus it is distinguished from day-to-day management in this application.

3. Framework of analysis

The proposed framework consists of three dimensions of analysis. These components are: (1) the institutional structure of the water system (policies, laws and organizations); (2) a set of standard water functions; and (3) a set of key characteristics of decision-making processes. In the next sections, we first define and characterize each component and then examine how they interact.

3.1. Structural components: policies, laws and organizations

For analytical purposes, institutional structures can be divided into three groups: policies, laws and organizations (Saleth & Dinar, 2004). Policies can be seen as setting out the overall direction to governance, while laws create the formal or unofficial 'rules of the game' and authorize the organizational structure necessary to implement policy. Together, policies and laws 'provide the skeleton that is fleshed out by institutions and management practices' (Iza & Stein, 2009). Below the policy level, more routine decision-making takes place within an organizational structure to implement policy.

Anderson defined the first concept, *policy*, as 'a purposive course of action followed by government in dealing with some problem or matter of concern' (Anderson, 1997). Similarly, Dye (1972) defines it somewhat more broadly as 'anything a government chooses to do or not to do'. The common view of the public policy process includes five stages: (1) setting the policy agenda; (2) formulating policy; (3) policy adoption; (4) policy implementation; and (5) policy evaluation (Jann & Wegrich, 2006). In practice, these steps do not always occur in the sequence outlined, but delineating the idealized steps is useful to illustrate the interrelationships among them.

Policies often are made explicit in documents that set out the broad goals that should guide the specific objectives and the main intervention lines to achieve them within a given time frame. Examples of policy documents in the water domain are national water development plans and strategies for water quality protection or for access to water and sanitation. Policy documents pertaining to other domains, such as national plans for agricultural development or strategies to fight against desertification are often also relevant to water governance.

For the second concept, the word *law* is interpreted in a broad way to encompass both codified or written laws and unwritten rules and customary practices. Codified law related to water resource governance can be subdivided into four categories[3]: (1) bilateral, multilateral or other international agreements that have been signed or ratified by the country; (2) acts, statutes and codes legislated by a supreme national law-making authority; (3) decrees, orders and regulations formulated by the highest committee of the executive branch of government; and (4) orders, rules, decrees and by-laws developed by inferior committees or officers of the executive branch. Unwritten laws are local customs and practices that are abided by out of a sense of obligation and that are handed down through the generations as a function of culture and tradition.

Laws relevant to this exercise will be found both inside and outside the water sector. Laws from sectors such as water, environmental regulation, public health, hydropower generation and agriculture will all affect the governance of water resources. Also more generic legislation may serve as a basis for the formation of groups such as water user associations or non-governmental organizations.

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[3] We thank Gabriel Eckstein for helping us clarify these categories.

If laws are the rules of the game, *organizations* can be seen as the players. Organizations are groups of individuals engaged in purposive activity. The constraints imposed by the legal framework, together with the other institutional constraints, define the opportunity set and therefore the types of organizations that emerge (North, 1994). Organizations comprise one large and important class of actors and stakeholders in water governance. These include public water management organizations created under water sector law, informal or customary organizations that manage water or provide water services locally, and NGOs and other organizations established under generic laws or laws applying to other sectors[4]. Examples of typical organizations acting in the water sector are ministries of the environment and water resources, water user associations, water supply utilities, water research institutes, independent regulatory commissions and trade organizations for water-related equipment and services. These are thus the entities that develop and manage water resources, supply water, use water and protect (and sometimes pollute) the environment. In other words, they are the actors that carry out, and are governed by, the functions described in the following section.

Different countries, of course, have evolved very different organizational structures. Ministries, for example, may be responsible only for water, for water and environment, for water and agriculture, for water and energy or any of a variety of other combinations. Moving down into the administrative hierarchy, however, organizational diversity tends to diminish and structures converge on similar units based on their functions. Nevertheless there is no routine prescription or standard for a 'good' organizational arrangement based simply on structural considerations, such as the existence (or not) of a given agency or a specific distribution of responsibilities among the existing organizations. Consequently, we have shifted our primary focus from specific structures to the functions that water sectors must perform, which often have a great deal in common across a wide variety of settings and which provide a useful framework for performance-based assessment.

3.2. Water functions

A substantial consistency in the types of function that water sectors perform across a wide range of countries has been observed (Svendsen *et al.*, 2005a). This has enabled the identification of a set of core functions, defined as processes routinely carried out to achieve specified ends, which any well-functioning water sector must perform. The use of a set of standard water governance functions is a fundamental and distinguishing element of our approach to water governance.

This approach had its origins in earlier work by Svendsen *et al.* (2005a) which included a discussion of institutions, organizations and policies in relation to water management, and proposed a list of essential functions (medium- to long-term planning, allocating water, distributing water, monitoring water quality, enforcing water quality, protecting against water disasters, protecting ecology, constructing hydraulic facilities and maintaining facilities). Adaptations of this approach have been applied in Mexico (Wester *et al.*, 2005), South Africa (de Lange *et al.*, 2005), Vietnam and Turkey (Svendsen *et al.*, 2005b, c).

In developing the present framework, the list of functions from Svendsen *et al.* (2005a) served as a starting point. It was then refined and consolidated through extensive interaction and discussion,

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[4] Individuals comprise the other class of stakeholders; however in more mature water governance set-ups, individuals are often represented by organizations to give themselves effective voice.

incorporating input and feedback from academics and practitioners in the field[5]. The list below includes the basic water functions that should be performed by any national water sector if it is to be effective. The list of functions reported does not extend to provision of water services to users. Though not necessarily simple or easy, provision of water services is seen as a routine administrative/managerial function that follows from effective performance of the five water functions, presented in Table 1. Each of the five functions is broken down into several sub-functions.

Table 1. Standard water functions.

Function	Sub-functions
Organizing and building capacity in the water sector	- Creating and modifying an organizational structure - Assigning roles and responsibilities - Setting national water policy - Coordinating and integrating among sub-sectors, levels and national sub-regions - Establishing links with neighbouring riparian countries - Building public and political awareness of water sector issues - Securing and allocating funding for the sector - Developing and using well-trained water sector professionals
Planning strategically	- Collecting, managing, storing and using water-relevant data - Projecting future supply and demand for water - Designing strategies for matching expected long-term water supply and demand and dealing with shortfalls (including drought mitigation strategies) - Developing planning and management tools to support decision-making
Allocating water	- Awarding and recording water rights and corollary responsibilities. Establishing water and water rights transfer mechanisms. Adjudicating disputes. Assessing and managing third-party impacts of water and water rights transactions
Developing and managing water resources	- Constructing public infrastructure and authorizing private infrastructure development - Forecasting seasonal supply and demand and matching the two - Operating and maintaining public infrastructure according to established plans and strategic priorities - Applying incentives and sanctions to achieve long- and short-term supply/demand matching (including water pricing) - Forecasting and managing floods and flood impacts
Regulating water resources and services	- Issuing and monitoring operating concessions to water service providers - Enforcing withdrawal limits associated with water rights - Regulating water quality in waterways, water bodies and aquifers (including enforcement) - Protecting aquatic ecosystems - Monitoring and enforcing water service standards

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[5] The concepts presented here were reviewed in a March 2009 workshop held in Egypt involving 35 experts from Egypt, Jordan, Morocco and Oman, as well as USAID and the team members of the project that served as a framework for the development of this study. The team included researchers and professionals belonging to the following organizations: IRG, International Water Management Institute, Oregon State University, Computer Assisted Development Incorporated, Nile Consultants and ECO Consult.

3.3. Processes of governance decision-making

Water governance is, in essence, a series of interlinked decisions. The way in which decisions are made matters a great deal to stakeholders, water service clients and to the general public. Moreover, the nature of the decision-making process can be an important determinant of the decision actually reached (Green & Chambers, 2006). Processes that are more open can place new information before decision-makers, enhance their awareness of the interests held by various groups, and expose discussion and relationships to public scrutiny. Thus the decision-making processes employed comprise another critical element of water governance.

In this context a key question remains as to what constitutes *good* water governance. In our view, the decisions comprising good water governance must be effective, and the process by which those decisions are reached must conform to certain normative standards. What constitutes broadly valid normative standards, however, has been the subject of enormous debate, much of it occurring in the context of Integrated Water Resources Management (IWRM).

These elusive normative principles have been at the heart of most IWRM discussions. The GWP (2000) defines IWRM as 'a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems'. The same organization also remarks that IWRM demands a new framework for the interactions among actors, laws and politics, and identifies several principles for effective water governance.

While few would disagree, in the abstract, with the idea of managing water and other resources balancing the social, economic, political and environmental dimensions of that management, there are dissenting views on its practical meaning. Jonch-Clausen & Fugl (2001) fear that IWRM is simply 'one of those buzzwords that everybody uses but means many different things to different people'. Biswas (2004) has contended that many people have applied the IWRM tag to the same approaches they would have otherwise used, a sentiment echoed by Molle (2008). Shah *et al.* (2005), van Koppen *et al.* (2007) and Lautze & Giordano (2007) each highlight the limitations to imposing developed country frameworks on developing country conditions. Giordano & Shah (2014) even showed that ignoring, or even acting in opposition to specific IWRM principles, can still produce the desired water outcomes. All of this calls for caution when applying the same framework, based on somewhat ambiguous principles and incorporating a strong normative perspective, to multiple developing countries.

The principles of effective governance defined by GWP (2000) were further refined by the World Water Assessment Programme (WWAP) to produce a list of eight basic features of good governance: participation, transparency, equity, accountability, coherence, responsiveness, integration and ethical issues (WWAP, 2003). These principles are diverse. Some, such as participation and transparency, describe desirable features of decision-making processes. Others, such as equity, represent desired outcomes. In our framework, these principles have been filtered using two primary criteria. First, because we were aiming at a practical system of measurement and benchmarking, the concepts had to be capable of being defined operationally. This also meant that they had to be measurable in some way. Second, due to our understanding of water governance as a dynamic decision-making process rather than a structure or a system, we have emphasized those attributes that characterize the decision processes, which in turn comprise the heart of water governance. This filtering has led to the inclusion of characteristics such as transparency, participation and rule of law, while those such as equity which characterizes the

outcomes of the governance process, and ethical considerations, which does not lend itself to definition or measurement[6], have been excluded.

Thus, we included in our list of features characterizing good governance decision-making the following[7]:

1. **Transparency and openness**. *Information should flow freely within a society. The various processes and decisions should be…open to scrutiny by the public.* In practice, this requires demonstrated willingness by governments to share information related to water sector policy, legal and regulatory changes, development plans, water allocation decisions, water resources status and uses, and the like.
2. **Participation**. *All citizens, both men and women, should have a voice, directly or through intermediate organizations representing their interests, throughout water governance policy formulation and decision-making*. In practice, this requires the demonstrated willingness by the government to solicit and consider input from stakeholders in civil society and elected legislators. It also requires the demonstrated willingness of government leaders to make changes and adjustments to proposals on the basis of input received.
3. **Accountability and integrity**. *Governments, the private sector and civil society organizations should be accountable to the public or the interests they represent*. In practice, governments and other organizations active in water governance should openly disclose their actions and the results of governance decision-making and should practice subsidiarity, mandating that decisions be taken at the lowest competent level. Governments should also undertake actions to reduce corruption and illicit personal gain in water sector decision-making.
4. **Rule of law**. *Legal frameworks should be fair and enforced impartially*. In practice, decisions should be made in conformity with specified laws, practices and procedures.
5. **Responsiveness**. *Institutions and processes should serve all stakeholders and respond properly to changes in demand and preferences, or other new circumstances*. In practice, governments should monitor and note changing conditions of water supply and demand and respond appropriately. Governments should also regularly review and assess their water-related policies, structure, programmes and the resulting outcomes and make appropriate revisions.

3.4. Connecting governance elements, functions and decision-making processes

From the discussion above it is clear that the attributes of good governance are related to the decision-making processes, and not necessarily to the final outcome of those processes. However, a good governance system must have a clear intention towards achieving outcomes related to the water priorities defined in each country. In turn, outcomes are attained through adequate institutional structures and a good performance of basic water functions (Figure 1).

Policies, laws and organizations provide the institutional structure in which all types of decision are made. Effectiveness in providing outcomes stems from adequate performance of a set of standard functions that must be executed by any water sector to fulfil its mission. The exact nature of that mission is

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[6] Coherence and integration are included in our framework under the first standard function (Organizing and building capacity in the water sector), and are thus excluded from our list of decision process attributes.
[7] Statements in italics are the definitions used by WWAP (2003) and, in the case of rule of law, by UNDP (1997).
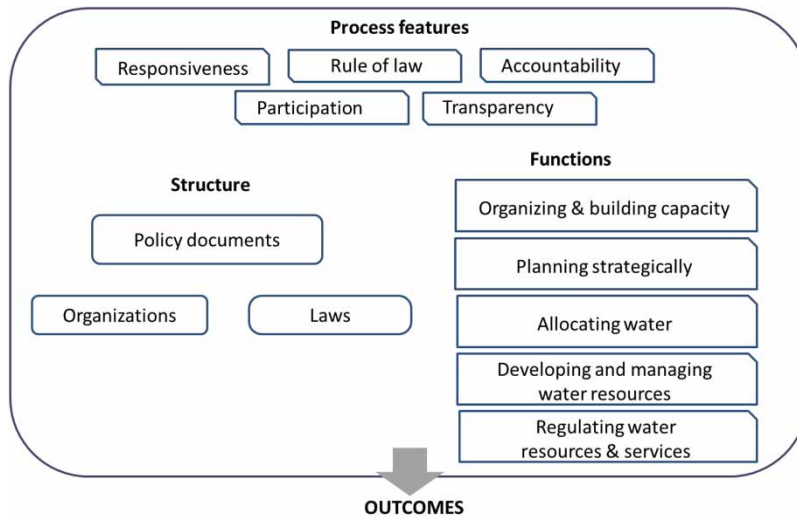
Fig. 1. Water governance assessment framework.

determined by the values and policies framed by national leaders and interest groups and embodied in laws and organizations. But, regardless of the specific goals established by these policies, this set of functions must be performed effectively to implement the goals. Functions are seen as cutting across the domains of policy, law and organization to yield results. By also considering basic water functions, we move beyond the static view of nominal structures made up of policies, laws and organizations and also look at the effectiveness of execution of necessary functions of the water sector. Finally, the features of governance decision-making processes define its openness to the opinions and interests of the public, its fairness, its self-awareness and its ability to adjust to changing conditions.

4. Methods

To test this framework, the MENA region was selected, as it presented characteristics that make its water challenges especially pressing: a chronically water-stressed region where predictions show that population growth, economic development and climate change impacts will exacerbate that stress (Molden, 2007). Most countries in the region are still strongly dependent on irrigated agriculture as a source of livelihood and employment for their rural populations. Nevertheless, the fastest growth in water needs is likely to occur in other economic sectors. Water productivity in existing uses has to increase in response to growing demand and the strong likelihood of a shrinking supply as a result of the changing climate. Clearly, hardware solutions to these formidable challenges are not, by themselves, sufficient. Most of the region's countries have already constructed significant water resource infrastructure, but the effectiveness of water governance and management has often lagged behind (Bucknall, 2007; Mollinga, 2010).

In this context, the framework presented above was used as a basis to design a water governance benchmarking system, which was tested in six countries of the MENA region. The purposes of the assessment process included: (1) producing a snapshot of water governance in a particular country

that could be used as a base to assess changes over time; (2) providing for comparisons of water governance capacity and performance among countries; and (3) providing a basis for a national dialogue of water governance status and the causes of any perceived deficiencies.

The assessment consisted of three separate analytic processes:

(a) **A content analysis of policy and legal documents in each country**[8]. This analysis was intended to define the context for water governance decision-making in the target country. It comprised a systematic analysis of a set of water-related policy and legal documents retrieved early in the overall assessment process, including both documents specifically aimed at water and those indirectly influencing the water sector. In each case, we consulted with in-country experts to determine which documents were appropriate to evaluate.

The document analysis considered the policy and legal documents that specify how standard water functions and formally mandated decision-making processes should be carried out. The analysis followed the general approach of a content analysis, which systematically seeks to identify patterns and meanings (Berg, 2007). Two steps were involved. First, words, phrases and sections of the documents were coded and tagged by water governance elements (the 25 sub-functions and six decision-making processes). To ensure intercoder reliability (Lombard *et al*., 2008), two coders were responsible for coding the documents independently and then reaching consensus on the codes if there were differing interpretations. Second, three analysts evaluated the extent and context of coverage for each element by consulting the tagged elements. The analysis was both quantitative and qualitative, producing a numerical score and a contextual description for each element. Policy and legal material was evaluated separately, so that consistency between the two could be assessed, thus producing two separate sets of results for each element. Numerical scores ranged between 1 (framework element is not covered in the provided documents) and 4 (extensive document coverage) (for more details see Appendix 1, available online at http://www.iwap-online.com/wp/016/005.pdf). The three analysts assigned scores independently and any differences were resolved using a formal resolution process.

(b) **An organizational mapping of water governance in each country**[9]. During preliminary interactions with local informants, important water governance-related organizations in each country, both public and private, were identified and their formally mandated roles outlined. These organizations were then examined, relative to the standard water sector functions, to map the de facto organizational coverage of the functions. The analysis employed a matrix-based assessment tool in which panels of national water experts rated the degree of de facto involvement of each organization in decision-making regarding particular water governance functions in that country (Appendix 3, available online at http://www. iwaponline.com/wp/016/005.pdf). Typically, groups of 20 to 25 experts drawn from five different water sub-sectors[10] discussed each function in mixed groups and then individually rated the influence of the various organizations, resulting in an *Organizations and Functions (O&F) matrix*.

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[8] A detailed description of the methodology employed can be found in the Rewab Project Desk Study Protocol, http://www.watergovernance.org/documents/WGF/ReWaB-files/Desk-Study-Protocol.zip.

[9] A detailed description of the methodology employed in the organizational mapping and the expert-based assessment process can be found in the Rewab Project Fieldwork Protocol, http://www.watergovernance.org/documents/WGF/ReWaB-files/ReWaB_Fieldwork_Protocol_Final.pdf.

[10] Water resources, irrigation, other water-using sectors, national policy-makers and advisors (see Appendix 2, available online at http://www.iwaponline.com/wp/016/005.pdf).

(c) **An expert-based assessment**. This activity measured the overall level of national effectiveness in performing the five standard water functions (functional components) and the level of application of five good governance decision-making features defined in our framework. Both ratings were derived from responses solicited from the same stratified panel of experts employed in the O&F mapping exercise (Table 2).

For the assessment of functional effectiveness, the participants in the rating sessions were asked to complete a questionnaire using a four-value rating scale (Appendix 4, available online at http://www.iwaponline.com/wp/016/005.pdf). Respondents discussed the scoring in mixed groups and then completed questionnaires individually. A second questionnaire was used to rate the degree of application of the five good governance decision-making features (Appendix 5, available online at http://www.iwap-online.com/wp/016/005.pdf). Country performance was assessed against the highest conceivable level of each of the five features while considering a common set of five water-related scenarios used in all countries in which the assessment was conducted. The scenarios employed in the initial assessments were: (1) increasing demand for drinking water; (2) decreasing groundwater levels; (3) strategic planning for a national water policy; (4) regulating water quality in rivers, aquifers and waterways; and (5) matching supply and demand in agriculture. For each scenario, participants used a four-value scale to score two to five statements related to each of the five decision-making features (participation, transparency, integrity and accountability, rule of law and responsiveness). Participants first discussed the scenarios in mixed groups and then completed the questionnaire individually[11]. Although these preliminary group discussions could influence the individual scores, this method was still chosen because it allowed the respondents more opportunity to develop a clear and common understanding of the concepts.

5. Results and discussion

For a variety of logistic and other reasons, data sets for the assessed countries had different levels of completeness. For Jordan and Egypt[12] the full data sets comprising policy documents, legal documents

Table 2. Water experts that participated in the scoring workshops.

Strata	Egypt	Jordan	Morocco	Oman	Turkey	Yemen
Water resources	6	3	3	10	8	3
Irrigation	11	9	4	5	6	6
Other water-using sectors	7	2	7	3	9	3
National policy-makers	0	5	3	0	4	1
Advisors	2	8	3	1	6	4
Total	26	27	20	19	33	17

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[11] In later assessments, the standard scenarios were dropped in favour of a sample of important recent governance decisions in the target country, identified by a national panel of experts.

[12] The reader should be aware that the content analysis and fieldwork were undertaken in 2009–10, when Egypt was still ruled by Mr Hosni Mubarak.
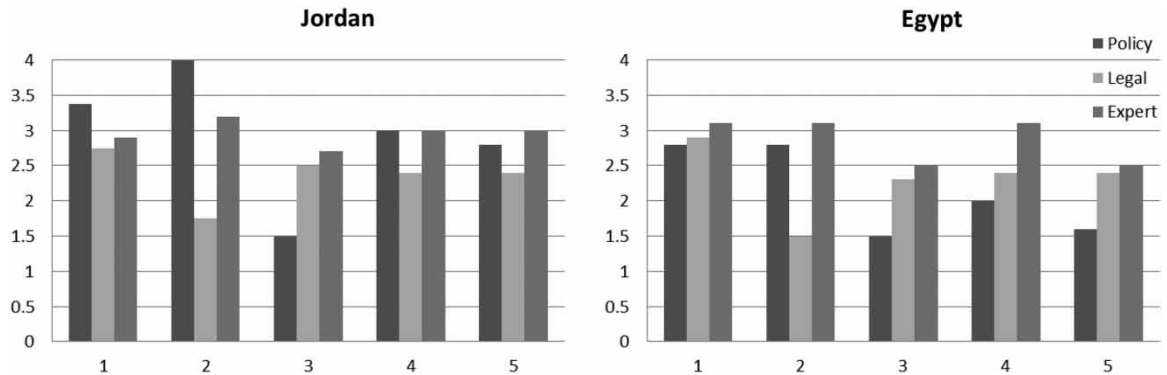
Fig. 2. Water functions scores for Egypt and Jordan.

and expert-based scores were compiled. Data sets for Morocco and Oman included the legal documents and the expert-based scores, while for Turkey and Yemen only expert-assigned scores were acquired.

When looking at the two countries with the complete data set (Figure 2), it is interesting to note that *Strategic Planning* (Function 2) received relatively low scores[13] for legal coverage (Egypt 1.5; Jordan 1.7) and relatively high scores for policy (Egypt 2.8; Jordan 4.0). This pattern is consistent with the fact that Function 2 is instrumentalized mainly through policy documents. Similarly, Function 3 (*Allocating*) is, by its nature, defined mainly through legal documents, which explains its higher scores in legal (Egypt 2.3; Jordan 2.5) than in policy documents (1.5 in both countries). Interestingly, no clear correspondence was found between the document coverage and the functional effectiveness as perceived by the country experts. In both countries the effectiveness scores are similar while the documents analysis shows variations across functions. This suggests that effectiveness is not necessarily rooted in well-developed legal and policy documents as is often assumed. It could also suggest that informal rules and customary practices play a large role.

The comparison of the legal and expert-based scores in Morocco and Oman is also interesting. In Morocco, the comparison suggests an implementation gap in Function 5 (*Regulating*), as it has similar legal coverage (2.4) but received a lower performance score relative to the other functions; 1.9 vs 3.1 average of the other four functions. In Oman in general the legal coverage is relatively low across categories while the expert-based assessments are relatively high (2.9).

When looking across the four countries where legal documents could be analysed (Figures 2 and 3), it can be observed that *Strategic Planning* (Function 2) was the weakest legal function, while *Organizing the Sector and Building Capacity* (Function 1) was consistently the strongest. This may reflect the fact that in the Middle East, laws are often special purpose legislation, drafted primarily to establish new organizational units, while more comprehensive water laws are less common.

Finally, in Turkey and Yemen, the available data sets allow only limited analysis, pointing to the value of having an integrated approach that combines policy documents, legal documents and expert perception. In Turkey, the expert-based scores show a quite balanced and well-performing set of functions, except perhaps for Function 5 *(Regulating)*, which received the lowest score (2.4). In the case of Yemen, the expert-based analysis reveals a water system needing substantial improvements in the performance of

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[13] Scores for each function refer to the average of the scores obtained in the associated sub-functions.
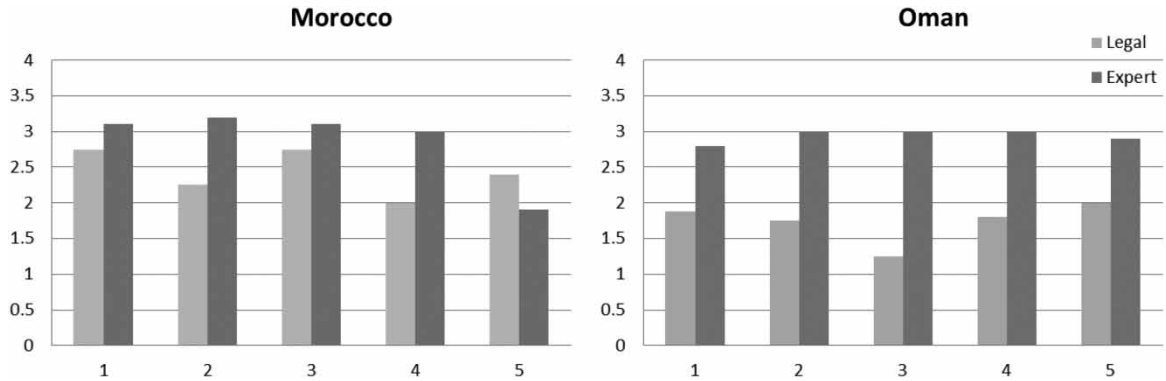
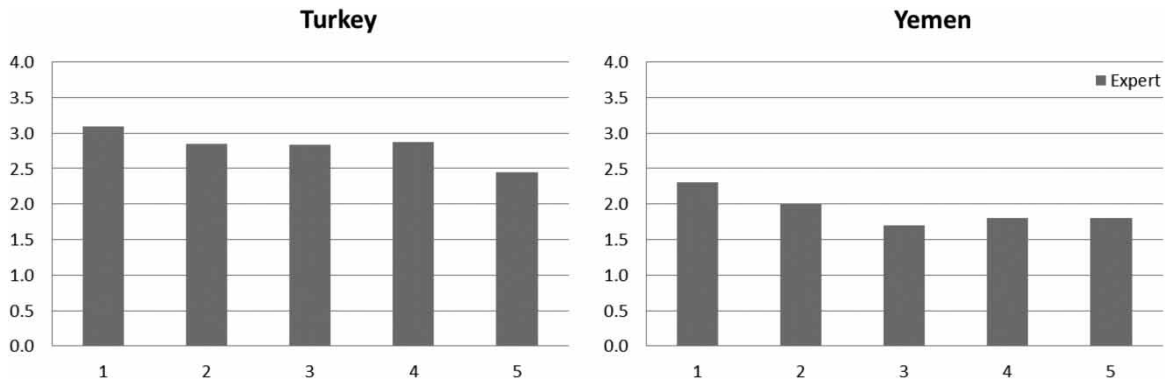Fig. 3. Water functions scores for Morocco and Oman.

Fig. 4. Water functions scores for Turkey and Yemen.

most of all the functions, as the highest score was only 2.3 (Function 1, *Organizing the Sector and Building Capacity*), while the remaining four functions obtained equal or below 2.0 (Figure 4).

With respect to particular functions and in terms of effective performance (expert-based), overall *Allocating* (Function 3) and, particularly, *Regulating* (Function 5), ranked below the other three. This pattern was relatively consistent across countries, although there were some exceptions. Morocco, for example, was rated by its experts as relatively effective at allocating and reallocating water. The relative weakness of these two functions overall reflects a couple of things. First, there is a long-standing emphasis in the region on developing new sources of supply, in contrast to an explicit reallocation of existing supplies. Second, the state plays a predominant role in both developing and managing water resources and delivering water-related services. Because of its pervasive involvement, the state often perceives little need to regulate itself. The idea of establishing an independent regulatory authority as a check on the discretionary power of the state is finally, but slowly, emerging in the region. Jordan, for example, is currently considering the establishment of a regulatory agency, independent of the Ministry of Water and Irrigation, to regulate the utilities that provide the domestic water service in the country.

As explained before, water governance is about making decisions, and the way in which those decisions are made is as important, in some ways, as the decisions themselves. The theoretical

framework presented in the previous section identifies five features of effective decision-making: (1) *participation*; (2) *transparency*; (3) *integrity and accountability*; (4) *rule of law*; and (5) *responsiveness*.

Scores evaluating the extent of country policy and legal document coverage of the basic character-istics of good governance decision-making, together with ratings of their actual application, are shown in Figure 5.
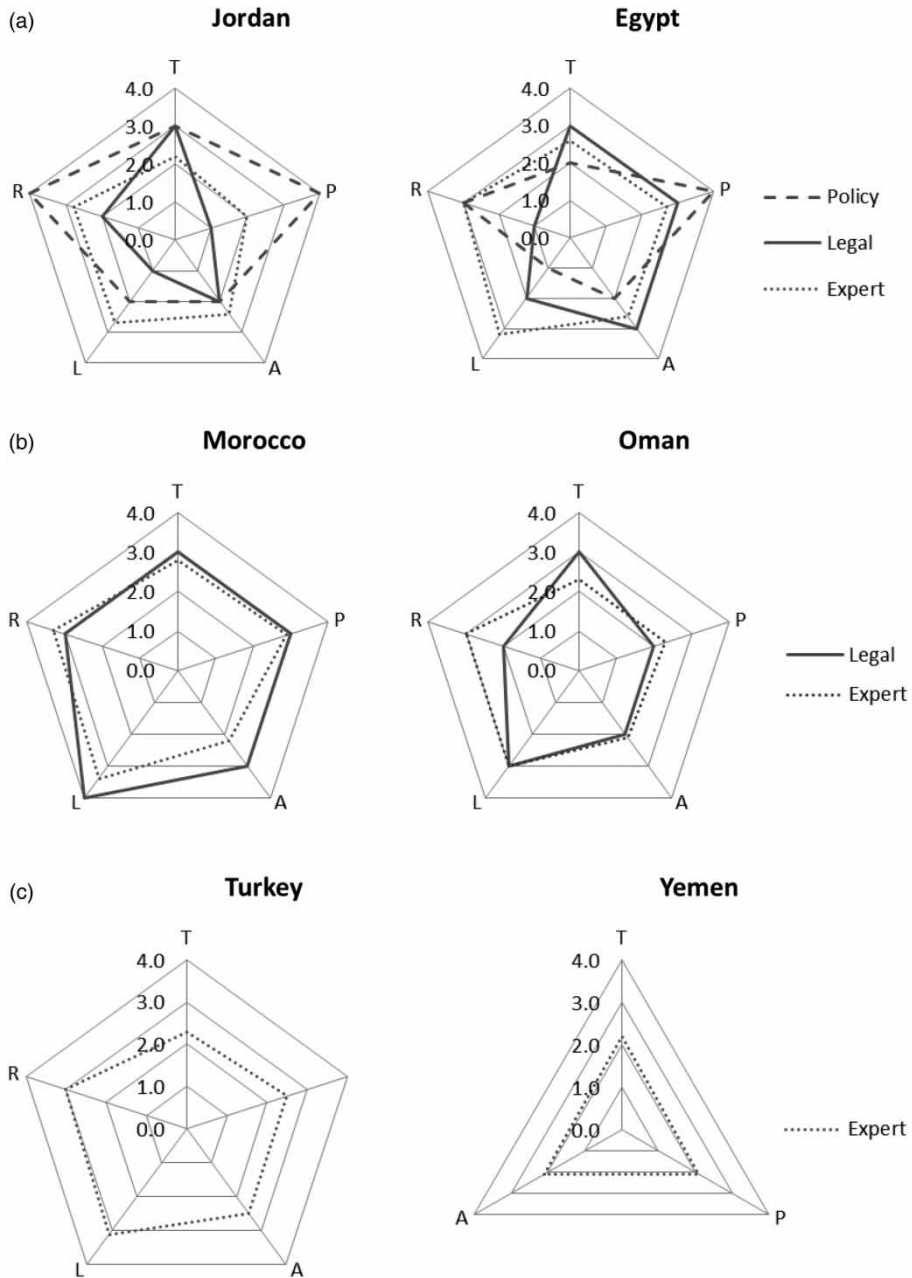

Fig. 5. Scores for the process features.

The analysis of the scores obtained across the different assessment components (policy documents, legal documents and expert-based assessment) yields interesting insights.

In Jordan, participation is strongly supported in policy documents (4.0) but has little legal backing (1.0), which is consistent with the low score assigned to this feature by the consulted experts (2.0). The coverage of transparency in legal and policy documents was relatively high (3.0 in both cases) though it received a low score in the expert-based assessment (2.2), suggesting a possible implementation gap. As for integrity and accountability, the scoring was low across the assessment components (2.0 in policy documents, 2.0 in legal documents and 2.4 in expert-based assessment). Rule of law and responsiveness both have low legal backing (1.0 and 2.0) in water-related legislation but were more favourably assessed by experts, perhaps reflecting that these two features are not easily made explicit in water regulation, even when they are acknowledged in policy documents (responsiveness received a 4.0 in Jordanian policy documents).

In Egypt, the assessment showed a disconnection between the coverage in the legal and policy texts and the performance in practice, as judged by the consulted experts. The features participation, transparency, and integrity and accountability received similar, rather low scores in the expert-based assessment (2.7, 2.6 and 2.6), while their legal and policy coverage varied, with participation receiving high scores in both policy and legal documents (4.0 and 3.0), transparency showing a policy coverage score of 2.0 and a legal coverage of 3.0, and integrity scoring 2.0 for both document types. The discrepancy in rule of law and responsiveness is even more evident, as they both obtain expert scores of 3.2 and 3.0 despite scores of 1.0 and 2.0 in legal backing.

In Morocco, the scores in general are higher across the board, and there is a good correspondence between the legal coverage and the perception by the consulted experts, except for integrity and accountability, which has a higher legal backing score (3.0), but lower expert score (2.2).

Finally, in Oman the scores for participation show consistency of low legal coverage (2.0) and the perception of the consulted experts (2.3). The good legal coverage of transparency (3.0) is not reflected in the expert-based score (2.3), while scores for integrity and rule of law are low and consistent across the assessment components.

The analysis of the features suggests that in the assessed countries participation is clearly acknowledged in the policy documents – which is in line with the importance given to this feature in international fora and declarations of principles – but its legal backing and quality in practice are still uneven. Transparency has a good legal support but its implementation in practice is still to be improved. Integrity and accountability in general received lower scores across the countries and the assessment components. This could have at least two explanations. First, integrity and accountability are sensitive issues, as the lack of integrity means corruption. Thus, it could be a subject that is not always addressed explicitly in legal and policy documents. Second, the level of integrity is usually rooted in the overall governance of a country rather than in a specific sector such as water. An interesting point is that in general in the expert-based assessments of rule of law and responsiveness scored higher than the other process features. This apparent discrepancy could be explained by the difficulty, as emerged during the expert workshops, to come to common understandings of these two features and led us to exclude them from the assessment in the final country of the study (Yemen).

6. Conclusions

Improving water governance is now one of the highest policy priorities in international water discourse as well as the national decision-making bodies of many countries. Despite the desire to

improve governance, there are few tools to inform the process. In fact, there is still substantial confusion over what water governance actually means and, partly as a result, no empirical frameworks to help debate priorities for change and assess results. This paper provides at least the starting point for such a framework.

The framework rests on a definition of governance decision-making and includes consideration both of capacity for good governance and actual performance of governance decision-making. Performance is defined in terms of five standard water governance functions which must be performed capably by any well-performing governance regime. Higher-level governance decision-making is distinguished from day-to-day management to provide a sharper focus on overarching longer-term policies and laws which define the framework for routine management. Structures of water governance are shown to rest on the three pillars – policies, laws and organizations – while the processes of governance decision-making are characterized by five key attributes – transparency, participation, accountability and integrity, rule of law and responsiveness.

Using the framework, practical tools were developed to assess the performance of water governance and applied to a case study of the MENA region. The tools included both document analysis and information derived from panels of national experts in each country. While recognizing that this was a first attempt at assessing water governance, the results provided a number of insights from the case study countries to inform future water governance assessments and water governance more broadly.

In terms of the case study results themselves, the comparison of documental evidence and expert perception at times revealed a disconnect, suggesting implementation gaps or that informal rules that deliver results are in place. The comparison of process features and functional performance did not show consistent patterns. In the case of Yemen, scores were low across the board and in Morocco consistently high. In the other four countries, however, scores were not consistently correlated. In any case, this highlights the convenience for consideration and assessment of not only individual components of water governance but how together they relate to the functionality of water governance within a country. Moreover, having different levels of completeness of the data sets (only expert assessment; expert assessment and legal analysis; expert assessment, legal and policy analysis) confirmed the richness added by combining the different tools, to see governance components from different perspectives and data sources.

While the results provided initial indications of how water governance was connected with effectiveness of the water system across a range of countries and provided a baseline for examining how water governance changes over time, implementing the framework also brought to light a number of practical issues that need to be acknowledged in interpreting results and considering further application. For example, what does it mean to assess water governance (or that of any other sector) within an undemocratic or authoritarian system? Similarly, a key feature of the expert panel process was a balanced representation from five different sub-sectors of the national water systems so as to account for bias based on perspectives and interests. However, trying to achieve balance across the formal water sector resulted in overwhelmingly male panellists, who were likely to have other similarities in education and background that were less visibly obvious. Furthermore, our sample was a reflection of those in formal decision-making positions across the water sectors of the case study countries, but may not represent well the full range of water service users and informal decision-makers. Despite the fact that the questionnaires and rating forms were translated into the national languages, the rating workshops were performed mostly in English in all countries except for Morocco (where it was conducted in French). Thus, the linguistic requirements also added additional bias in expert

selection and would need to be considered in a broader benchmarking initiative. Finally, the assessment focused on the national level and thus ignored other governance levels.

A final lesson of the effort was on the value of providing a format to discuss water governance. The process of conducting the assessment created a forum and neutral ground where water experts from different water-related fields could talk in informal groups about water governance, when it works, when it doesn't and what could be done for improvement. This was a positive side effect of the assessment, a grain of sand to move towards better water governance.

In summary, it is certainly true that not everything that counts can be counted and that governance is among the concepts that is most difficult to quantify and measure. Nonetheless, the increased emphasis on improved water governance as the key to solving today's water problems suggests we need to have at least some tools on hand to provide policy advice on how governance is now performing, where performance can be improved and whether or not investment in improvements pays off over time in terms of better water futures. This paper presented a first step in that process.

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References

Ahmed, P. K. & Rafiq, M. (1998). Integrated benchmarking: a holistic examination of select techniques for benchmarking analysis. *Benchmarking for Quality Management and Technology 5*(3), 225–242.
Anderson, J. (1997). *Public Policy Making*. 3rd edn. Houghton Mifflin Co., Boston, MA.
Berg, B. L. (2007). *Qualitative Research Methods for the Social Sciences*. Pearson Education Incorporated, Boston, MA.
Biswas, A. K. (2004). Integrated water resources management: a reassessment. *Water International 29*(2), 248–256.
Bucknall, J. (2007). Making the Most of Scarcity: Accountability for Better Water Management in the Middle East and North Africa. MENA Development Report. The World Bank, Washington, DC.
Conca, K. (2006). *Governing Water: Contentious Transnational Politics and Global Institutions Building*. MIT Press, Cambridge, UK.

Dattakumar, R. & Jagadeesh, R. (2003). A review of literature on benchmarking. *Benchmarking: An International Journal* 10(3), 176–209.

de Lange, M., Merrey, D., Levite, H. & Svendsen, M. (2005). Water resources planning and management in the Olifants Basin of South Africa: past, present and future. In: *Irrigation and River Basin Management*. Svendsen, M. (ed.). CAB International, Wallingford, UK, pp. 125–144.

De Witte, K. & Marques, R. C. (2010). Designing performance incentives, an international benchmark study in the water sector. *Central European Journal of Operations Research* 18(2), 189–220.

Dinar, A. & Saleth, M. (2005). Can water institutions be cured? A water institutions health index. *Water Supply 5*(6), 17–40.

Durant, R. F., Fiorino, D. J. & O'Leary, R. (eds) (2004). *Environmental Governance Reconsidered: Challenges, Choices and Opportunities*. MIT Press, Cambridge, MA.

Dye, T. (1972). *Understanding Public Policy*. Prentice Hall, Englewood Cliffs, NJ.

Giordano, M. & Shah, T. (2014). Non-integrated water resources management. In: *Integrated Water Resources Management in the 21st Century: Revisiting the Paradigm*. Martínez-Santos, P., Aldaya, M. M. & Llamas, R. (eds). Taylor and Francis, Leiden, The Netherlands.

Green, J. F. & Chambers, W. B. (2006). *The Politics of Participation in Sustainable Development Governance*. United Nations Press, New York.

GWP (Global Water Partnership) (2000). Integrated Water Resources Management. Technical Advisory Committee, Background Paper No. 4. Global Water Partnership, Stockholm.

Hill, C., Furlong, K., Bakker, K. & Cohen, A. (2008). Harmonization versus subsidiarity in water governance: A review of water governance and legislation in the Canadian Provinces and Territories. *Canadian Water Resources Journal 33*(4), 315–332.

Iza, A. & Stein, R. (eds) (2009). *RULE – Reforming Water Governance*. International Union for the Conservation of Nature and Natural Resources. Available at: http://www.iucn.org/about/work/programmes/water/resources/toolkits/?4915/Rule--sustainable-water-rules, accessed 10 April 2014.

Jann, W. & Wegrich, K. (2006). Theories of the policy cycle. In: *Handbook of Public Policy Analysis. Theory, Politics, and Methods*. Fisher, F., Miller, G. J. & Sidney, M. S. (eds). CRC Press, Boca Raton, FL.

Jonch-Clausen, T. & Fugl, J. (2001). Firming up the conceptual basis of integrated water resources management. *International Journal of Water Resources Development 17*(4), 501–510.

Kante, B. (2011). Shaping an international governance system for environmental sustainability. In: United Nations, First Preparatory Meeting of the World Congress on Justice, Governance and Law for Environmental Sustainability. 12–13 October 2011. Kuala Lumpur, Malaysia.

Kaufmann, D. & Kraay, A. (2008). Governance indicators: where are we, where should we be going? *The World Bank Research Observer 23*(1), 1–30.

Lautze, J. & Giordano, M. (2007). Demanding supply management and supplying demand management. *Journal of Environment and Development*, 16(3), 290–306.

Lautze, J., de Silva, S., Giordano, M. & Sanford, L. (2011). Putting the cart before the horse: water governance and IWRM. *Natural Resources Forum 35*(1), 1–8.

Lombard, M., Snyder-Duch, J. & Campanella-Bracken, C. (2008). Practical Resources for Assessing and Reporting Intercoder Reliability in Content Analysis Research Projects. Available at: http://astro.temple.edu/~lombard/reliability, accessed May 2010.

Molden, D. (2007). *Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture*. Earthscan, London and IWMI, Colombo.

Molle, F. (2008). Nirvana concepts, narratives and policy models: Insight from the water sector. *Water Alternatives 1*(1), 131–156.

Mollinga, P. P. (2010). *Monitoring Public Engagement*. In: Water Management In The MENA Region: A Template with Guidelines. AWC-PEWM Deliverables 2 and 3; digital report for the Arab Water Council.

North, D. (1994). *Institutional Change: A Framework of Analysis*. Department of Economics, Washington University, St. Louis, MO.

OECD (2011). *Water Governance in OECD Countries: A Multi-Level Approach*. OECD Studies on Water. OECD Publishing.

OECD (2012). Water Governance in Latin America and the Caribbean: A Multi-Level Approach. OECD Regional Development Working Papers, No. 2012/04, OECD Publishing.

Pahl-Wostl, C., Mostert, E. & Tàbara, D. (2008a). The growing importance of social learning in water resources management and sustainability science. *Ecology and Society 13*(1), 24.

Pahl-Wostl, C., Gupta, J. & Petry, D. (2008b). Governance and the global water system: a theoretical exploration. *Global Governance 8*(4), 419–435.

Roberts, T. (2003). *Water Sector Governance in Africa.* Volume 1. Theory and Practice. Water Partnership Program.

Rogers, P. & Hall, A. (2003). Effective Water Governance. TEC Background Paper 7. Global Water Partnership, Stockholm.

Saleth, M. & Dinar, A. (2004). *The Institutional Economics of Water: A Cross-Country Analysis of Institutions and Performance*. Edward Elgar, Cheltenham, UK.

Scholz, J. & Stiftel, B. (eds) (2005). *Adaptive Governance and Water Conflict: New Institutions for Collaborative Planning*. Resources for the Future Press, Washington, DC.

Shah, T. & van Koppen, B. (2008). Is India Ripe for Integrated Water Resources Management (IWRM)? Fitting Water Policy to National Development Context. IWMI Report, Colombo.

Shah, T., Makin, I. & Sakthivadivel, R. (2005). Limits to leapfrogging: issues in transposing successful river basin management institutions in the developing world. In: Irrigation and River Basin Management. Svendsen, M. (ed.). CAB International, Wallingford, UK, pp. 31–49.

Solanes, M. & Jouravlev, A. (2006). *Water Governance for Development and Sustainability*. United Nations Publications, Santiago, Chile.

Svendsen, M. (2010). MENA Regional Water Governance Benchmarking Project. Final Report. International Resources Group, Washington, DC. Available at: http://www.watergovernance.org/documents/WGF/ReWaB-files/ReWaB-Final-Report.pdf, accessed 28 May 2014.

Svendsen, M., Wester, P. & Molle, F. (2005a). Managing river basins: An institutional perspective. In: *Irrigation and River Basin Management: Options for Governance and Institutions*. Svendsen, M. (ed.). CAB International, Wallingford, UK.

Svendsen, M., Ringler, C. & Duy Son, N. (2005b). Water resources management in the Dong Nai Basin: current allocation processes and perspectives for the future. In: *Irrigation and River Basin Management: Options for Governance and Institutions*. Svendsen, M. (ed.). CAB International, Wallingford, UK.

Svendsen, M., Murray-Rust, D. H., Harmancioglu, N. & Alpaslan, N. (2005c). Governing closing basins: the case of the Gediz River in Turkey. In: *Irrigation and River Basin Management: Options for Governance and Institutions*. Svendsen, M. (ed.). CAB International, Wallingford, UK.

Tropp, H. (2007). Water governance: trends and needs for new capacity development. *Water Policy 9* (Supplement 2), 19–30.

UNDP (1997). *Governance for Sustainable Human Development, A UNDP Policy Document*. UNDP, New York.

UNDP (2013). User's Guide on Assessment of Water Governance. Available at: http://www.undp.org/content/undp/en/home/librarypage/democratic-governance/oslo_governance_centre/user-s-guide-on-assessing-water-governance, accessed 4 April 2014.

UNEP (2012). The UN-Water Status Report on the Application of Integrated Approaches to Water Resources Management. Available at: http://www.un.org/waterforlifedecade/pdf/un_water_status_report_2012.pdf, accessed 4 April 2014.

van Koppen, B., Giordano, M. & Butterworth, J. (eds) (2007). *Community-based Water Law and Water Resources Management Reform in Developing Countries*. IV Series: Comprehensive Assessment of Water Management in Agriculture Series. CAB International, Wallingford, UK.

Wester, P., Scott, C. & Burton, M. (2005). River basin closure and institutional change in Mexico's Lerma-Chapala Basin. In: *Irrigation and River Basin Management*. Svendsen, M. (ed.). CABI Publishing, Wallingford, UK, pp. 125–144.

World Bank (2007). *Strengthening World Bank Group Engagement on Governance and Anticorruption*. Joint Ministerial Committee of the Boards of Governors of the Bank and the Fund on the Transfer of Real Resources to Developing Countries, Washington, DC.

WWAP (World Water Assessment Programme) (2003). *UN World Water Development Report 1*. World Water Assessment Programme, Paris.