DISCUSSIONS ON WATER GOVERNANCE: PATTERNS AND COMMON PATHS

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Introduction

The recognition that the "world water crisis" is in large part a "crisis of governance" (GWP, 2000; ROGERS & HALL, 2003; GALAZ, 2007) turned water governance into a prominent theme in the discourse of international agencies and organizations, in studies and in research. Google's *Ngram Viewer*, a database containing 5.2 million digitalized books, reveals that governance is gaining more attention and that its popularity has grown since 1990 in particular. Indeed, the term itself is becoming increasingly used (HAVEKES *et al.*, 2013). However, specifically on the theme of water governance, the database presents similar findings with the exception that significant discussions on this theme were less abundant before the year 2000 (BISWAS & TORTAJADAS, 2010; LAUTZE *et al.*, 2011).

In the last few years, water governance has grown increasingly as a theme in the work of international agencies and organizations. The OECD, recognizing that gaps in water management entail risks for national economies, launched 20 publications directly or indirectly related to water governance between 2011 and 2015 (OECD, 2016). Moreover, the *Water Governance Facility*, a 10-year collaborative program organized by the United Nations Development Programme and the Stockholm International Water Institute, has been publishing the results of their work since 2005. For this program, water governance is one of the most critical areas to consider for the sustainable development of water resources and water-related services (SIWI, 2015).

The theme is also increasingly present in meetings and conferences worldwide, entire sessions sometimes being dedicated to it. The question of water governance was firmly established in the water community at the Bonn Conference (2001) and the Earth Summit in Johannesburg (2002) (WWC, 2004; LAUTZE *et al.*, 2011). Notably, at the 6th World Water Forum (Marseille, France, 2012), "effective governance" was recognized as a critical condition for success in undertaking reform in water management systems worldwide.

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The 7th World Water Forum (Daegu-Gyeongju, South Korea, 2015) dedicated equal attention to the theme, with the event's organizers calling for concrete tools to realize the resolutions agreed at the previous Forum. On the occasion of this forum, the OECD coordinated discussions on water governance and assumed responsibility for gathering worldwide leaders and main stakeholders to hold discussions on the principles of water governance. This process culminated in the "Daegu's Multi-stakeholder Declaration on the OECD Principles on Water Governance", a global commitment to attain "effective water governance", which obtained 65 signatures.

In Brazil, the general "movement" of discussions on governance has also started to attract attention and substance in recent years. This movement was influenced by the approval of the National Water Resources Policy (PNRH in Portuguese) (*Lei N° 9.433 de 1997*), in 1997, which entailed significant institutional changes. The increasing literature on the theme is contributing mainly through reflections on the implementation of water policy. Notably, emphasis is made in such publications on the effectiveness and quality of decision-making processes and questions of ethics, justice and transparency (see JACOBI *et al.*, 2009; RIBEIRO, 2009, CAMPOS & FRACALANZA, 2010; SILVA, 2013). In addition to academic contributions, the National Pact for Water Management may be highlighted. It consists in a cooperation strategy of the National Water Agency with federated entities of the National Water Resources Management System (SINGREH in Portuguese). The National Pact is considered an important step forward to improve water management in Brazil (ANA, 2015).

At the end of 2014, WWF-Brazil launched the publication, "*Governance of Water Resources – Proposal of indicators to monitor implementation*". The organization affirmed that changes were required after the approval of the National Water Policy 18 years prior. Thus, it proposed the creation of an "Water Governance Observatory" (WWF, 2015). The 40 institutions involved in the initiative are currently undertaking a diagnosis of the SINGREH. The result of that work will be a basis for the creation and implementation of a "Good Water Governance Index" to monitor the national system.

Finally, as part of the OECD's worldwide studies on water, in 2015, the organization launched the report, "*Water Resources Governance in Brazil*". The report is the fruit of dialogue with the National Water Agency and more than 100 interested actors and stakeholders. It presents an action plan that aims to perfect what are considered critical conditions for more sustainable, inclusive and effective water policies in Brazil or, in other words, regimes for water governance and water allocation (OECD, 2015).

In becoming a prominent theme in the discourse of international agencies and organizations, and in academic research and discussions, water governance assumes different shapes and applications. In this way, it constitutes a multifaceted concept with an array of principles, methodologies and practices that contribute to the definition of this term. Given the continuous importance of the theme, this article offers a general overview of discussions on water governance. It is based on main contributions from the literature and research on political discourse in the main forums and global organizations. Such discussions provide indications of the paths to follow to attain effective results. They may potentially be a starting point for those intending to study or improve water governance systems at different levels and scales.

Water governance: in search of discussions and patterns

A series of methodological steps were followed in constructing the following overview of discussions on water governance. Firstly, researchers and key actors in Brazil and abroad were contacted in order to obtain indications of the present research's key words. Subsequently, an extensive review was carried out in the literature and other sources.

The research's database comprised the platforms Google Scholar and Scielo, the Capes Journal Portal, with emphasis on thematic editions on governance in relevant national and international journals. Websites of international agencies and organizations were also consulted: Global Water Partnership; OECD; World Bank; World Water Forum and Council; Water Integrity Network; Institute for Water Education - UNESCO; Water Governance Centre; UNDP; Water Governance Facility; UN-Water; CEPAL; USAID. In sum, data was gathered from scientific articles published in indexed journals, reports, technical notes, assessments and other types of documents produced by governmental departments and agencies, non-governmental organizations and international agencies.

Initially, the following key words were used: water management, water governance, governance, water security, integrated water resources management – IWRM, good governance, effective governance, adaptive management, resilience, social ecological systems, and adaptive capacity. These key words were entered into the research platforms together with the words "water" and "governance", and in different combinations for new searches.

Each of the combinations used as a search entry in the research platforms generated hundreds of results – and sometimes more. The criteria applied to select articles consisted in their academic relevance (citations) and "snowball" effect, meaning the number of authors cited or case studies used in the research. A scan of international organizations' and agencies' websites also revealed a smaller number of publications, mainly launched in more recent years.

This article is organized in three sections. Initially, the main ideas associated with the concept of governance are reviewed in order to simplify understanding of its applications to water management. Subsequently, an investigation of the literature on water governance is developed with consideration for the discussions and approaches that influence the concept. The findings and patterns related to water governance are then summarized and discussed, seeking to hone in on the essence of the aforementioned discussions and proposals. Finally, the conclusion provides a critique of the study's findings, leaving a basis for future reflections on water governance.

From governance to water governance

An abundant range of concepts, definitions and discussions exists in the literature on the theme of governance. This theme is part of the new tendencies in public administration and public policy management (JACOBI et al., 2015) and tends to focus on demand for systems to complement formal authorities (BATCHELOR, 2007). Indeed, many authors emphasize that governance is not a synonym of government (ROSENAU,

2000 *apud* GONÇALVEZ, 2005; TORTAJADA, 2010). Thus, increased confidence is attributed to an informal authority and value is given to genuine coordination and cooperation between the public and private sectors (BATCHELOR, 2007) and society.

Evolving concepts of government — top-down, centralized and hierarchical —represent a change for governance towards a new style of governing society that is more inclusive and cooperative. This evolution constitutes a departure from traditions of ordered rule and the concept of political orientation (HILL, 2013). Responsibilities that were previously exclusively dealt with by government have, in this way, started to be shared (STOKER, 1998).

Governance has mostly been used as an "umbrella" concept, lacking a consensual definition (TORTAJADA, 2010). Indeed, there exist underlying confrontations between rival theoretical bodies of knowledge and political and cultural traditions, for which governance has entirely different meanings (CASTRO, 2007). In truth, different international institutions uphold definitions of governance that they apply based on their own mandate, interests and bias (BISWAS & TORTAJADAS, 2010).

However, consistencies regarding the definition of governance are identified in Lautze et al. (2011). The authors highlight three central concepts that are generally included as part of the definition of governance: i) governance is consistently seen as a process involving decision making; ii) the process of decision making is carried out through institutions (including mechanisms, systems and traditions); and iii) the decision making processes and institutions involve several actors (LAUTZE *et al.*, 2011). In a similar analysis, Tropp (2007) affirms that governance is seen as a process of interactions based on accommodation, as opposed to domination, in decision making. Thus, negotiation, dialogue and work in networks are valued methods as the interactions and relationships between actors are critical for the results of governance (TROPP, 2007).

Use of the concept includes laws, regulation and institutions (formal and informal), but also refers to policies and government action, local initiatives and networks of influence. This includes international markets, the private sector and civil society, which are influenced by the political systems of which they are a part (JACOBI, 2009). Beyond norms, regulations and institutions, governance encompasses matters related to values (TORTAJADA, 2010) and principles. It is not something that the state does for society but the way in which society itself, and the individuals that comprise it, regulate all the different aspects of their collective life (CARIÑO, 2000).

For some authors, governing in the sense of governance is a way of improving the decision making process and institutions simply because it includes other non-governmental actors. However, even where governments show flexibility in their attempts to guide collective action, flaws in governance can occur (STOKER, 1998). Therefore, although governance is already practiced in many countries, the objective is to make it more effective (Rogers & Hall, 2003).

Since it is difficult to observe the process of governance, studies and discussions usually focus on systems of governance or frameworks under which such systems operate, which is to say, the associated agreements, procedures, conventions and policies (GRAHAM *et al.*, 2003). Institutions are understood as the "rules of the game" and the

interested stakeholders as the actors, allowing assessments to be undertaken to understand how the different stakeholders interact, the power dynamics between them and how they influence policies (JACOBSON *et al.*, 2013).

Such new processes and understandings of governance are especially prevalent in the area of environmental policies, with a basis in the ideas of public participation, which have been fundamental for the environmental movement (BINGHAM et al., 2005; MATOS & DIAS, 2013). The concept of water governance emerges as an opportunity to create new models for the exercise of local management (MATOS & DIAS, 2013), as well as management at other scales and levels (BUDDS & HINOJOSA, 2012). Thus, ideas related to governance – systems, mechanisms, processes and institutions – are combined with the development and management of water to create a new concept of water governance (LAUTZE *et al.*, 2013).

Pahl-Wostl & Knieper (2011) understand water governance as the ways in which actors interact at different levels (from local to international) and how that interaction is guided by various sets of rules, be they formal (e.g. water legislation) or informal (e.g. social norms). For Campos & Fracalanza (2010) water governance refers to a process in which new paths, theories and practices are proposed and adopted in the aim of establishing an alternative relationship between government and social demands, and managing different interests. Indeed, proposals for diverse "paths" exist in the literature on governance and other related themes, which have influenced the way in which governance has been apprehended and used.

Universe of water governance: literature, discussion and approaches

The concept of water governance, including that of governance in general, is still evolving (TORTAJADA, 2010). Conventional ideas about what governance implies, how governance happens and what the processes of governance seek to attain are changing (ARMITAGE *et al.*, 2012). The records on governance show that the water sector does not have a "natural center of gravity" on a worldwide level; there are a variety of competing actors and interests and no actually consensual process to deal with water science (GUPTA *et al.*, 2013).

In recent years, discussions on governance have assumed a broader scope, including questions such as gender, poverty, nexus (energy, food, climate), among others, and the establishment of good governance principles. There is a tendency of giving greater attention to how decisions are made (how, for whom and under what conditions). This contrasts with the traditional focus of water resources policies; the engineer-inspired approach focuses on "planning and providing" water to its different users in adequate quantity and quality. Interesting knowledge is being produced in the literature and in debates, the most prominent of which have discussions and proposals worth analyzing. Figure 1 presents a map created in connection with the present research on the main literature and debates that have influenced the concept, approaches and practices of governance.

Figure 1: Map of literature and debates directly and intrinsically related to water governance
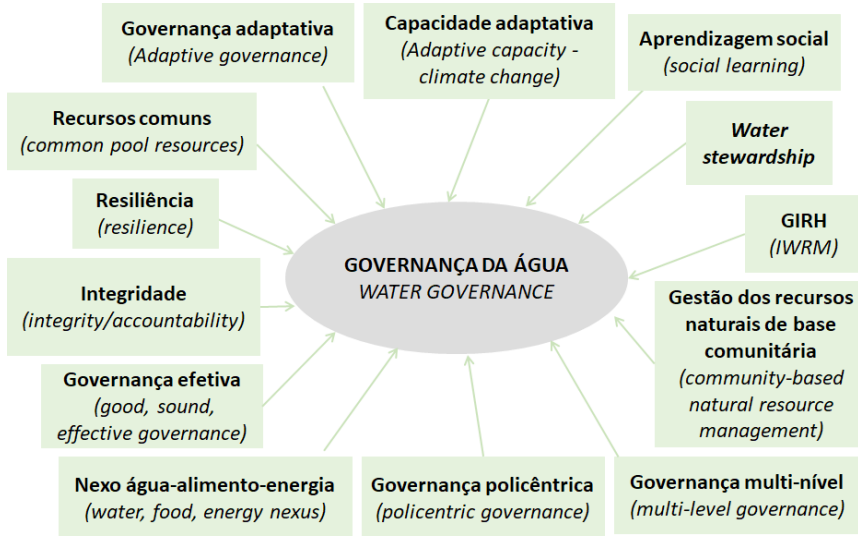
Source: authors' creation.

The map of literature and respective debates allow us to organize some of the main discussions on water governance in four groups based on the similarity of their theoretical principles and the findings of the research: i) "Fair governance", which includes discussions related to principles of water governance; ii) "Resilience, governance and adaptive capacity", which through theories, such as that of systems, discusses the inherent complexities and uncertainties of social and ecological systems; iii) "Nexus", which proposes a new relational logic to think about governance or, in other words, moving past sectoral breakdowns (also denominated "silos") to understand the interdependence between the sectors of water, food, energy and climate; iv) "Stewardship", which perceives the business and corporate sector as a potential protagonist for the sustainability of the productive chain and a way to improve governance. The related literature and its proposals are summarized below, including a discussion of their motivations, central ideas and potential.

Fair governance

The core of the research and debates on water governance often focuses both on general theoretical concepts (e.g. transparency, equity and accountability) and thematic concepts (e.g. integrated water resources management, water security and transboundary water management). Questions related to the global effects of climate change on governance are also included (KAYSER *et al.*, 2015). Additionally, discussions explore the influence of governance on these and many other themes and have pointed to governance as the response or solution to "water crises".

At a practical level, the most important discussion on water governance is based on identifying principles of good water governance (LAUTZE *et al.*, 2011). Good governance, or as designated by Gupta *et al.* (2010), fair governance, includes legitimacy in the elaboration of policies. This implies that policies must be accepted by members of society; processes and results of equitable policies must consider a society's conditions of inequality; processes should be responsive and present a high level of transparency, being capable of responding to different voices within one society; and clear accountability procedures should attribute responsibilities to the different parties involved.

In this spirit, Rogers & Hall (2003) present basic attributes or principles that the authors consider essential for effective water governance. They include, among others, questions related to openness, inclusivity, communication, coherence, integration, ethics, efficiency, and sustainability of policies, institutions and processes of governance. Participation is defended by diverse academics and international agencies and organizations as a fundamental principle for water governance. In this regard, Jacobson *et al.* (2013) refer to the possibility for citizens to contribute and influence the decision making process.

Framing the challenges for water resources in terms of "challenges for governance" allowed for the expansion of the water agenda. Such an understanding is increasingly accepted in development circles and used to scrutinize processes of democratization, corruption and power asymmetries (TROPP, 2007). For instance, increasing interest in anti-corruption mechanisms can be observed in recent years since, due to a series of factors, the water sector is vulnerable to corruption (JACOBSON *et al.*, 2013). The Global Corruption Report, published in 2008 (TRANSPARENCY INTERNACIONAL, 2008), describes the several ways in which corruption can impact on the water sector, particularly for water supply and hydro-electric services (UN-WATER, 2014). Mainly, large hydraulic infrastructure projects are complex and capital intensive, making contracts very lucrative, manipulation difficult to detect, and corruption more probable (JACOBSON *et al.*, 2013).

Although the harmful effects of corruption are well known, in most places, there is lacking political will to openly discuss this problem in both the public and private sectors, and at all levels (JACOBSON *et al.*, 2013). Evidence indicates that this state of affairs is slow-moving, for example, among certain governments and international donors. New actors, such as the Water Integrity Network, have emerged to spread consciousness and promote diagnostics to assess the risk of corruption and measures to avoid it (UN-WATER, 2014). For this network, the integrity of water itself acts as an opposing force against corruption in the water sector and is a fundamental aspect of improved water governance (WIN, 2015).

In discussions on corruption in the water sector, the principle of accountability appears as a path to address more specific problems such as the right to have access to water, sanitation and hygiene, known internationally by the acronym WASH. The principle of accountability, which consists in ensuring that governments and service providers are responsible for their action or inaction, is seen as a starting point for work in water governance (UNDP-WGF/UNICEF, 2015).

Consequently, poverty is made worse by lacking hygiene, sanitation and water. Poverty, according to USAID (2013), is sustained by poor and undemocratic governance,

weak and corrupt institutions and deep-seated power dynamics that lead to political and economic exclusion. Thus, good water governance is seen as "a prime vehicle for ensuring that local and national governments as well as the international system as a whole prioritize the needs of the poor in setting water policy and in designing water and sanitation services" (UNDP, 2004). In the scope of these discussions, some authors, initiatives and international agencies are advocates for certain matters of ethics (see GROENFELDT & SMITH, 2013), socioenvironmental justice (see FRACALANZA *et al.*, 2013) and gender perspectives (see CLEAVER & HAMADA, 2010). Under the optic of governance, water policies incorporate these aspects and others – such as the ecological integrity of ecosystems – through the perspective and approach of apprenticeship, coordination and collaboration for water resources management practices.

Many of the discussions presented herein, and many others, have been the basis mainly for the creation and proposal of assessment frameworks for water governance. For Jacobson et al. (2013), "[f]rom the practitioner's point of view, assessment is a first step to trigger changes that are needed to improve sector performance by showing where interventions would have the most impact." Such water governance assessments generally have several objectives, including: comparing, benchmarking, diagnosing an existing problem, monitoring, revising and identifying patterns and potential gaps (JACOBSON *et al.*, 2013).

Different authors and international agencies adopt different lenses to elaborate such assessments or comparative studies on experiences with water governance practices. Choosing an assessment approach or methodology can entail complications that, in turn, can limit or distort the results of comparisons between different cases. It is most important to define what is understood by the concept of governance and its most ideal form – good, effective, adaptive - and, thus, to establish criteria to assess the degree of "success" attained by the system in question.

In particular, principles of good or effective water governance, as maintained by Lautze *et al.* (2011), create important bases to assess the state of water governance in a given location. Assessments provide tools to identify opportunities to improve or enhance systems. Such principles also provide a foundation to create policies and for institutions. These ideas have been developed through rigorous analyses of hundreds of cases of collective management of natural resources, notably through the work of OSTROM (1990) on common pool resources (MERREY & COOK, 2012). The concept and principles of water governance provide a foundation to critically assess processes of decision making and policy implementation.

Resilience, adaptive capacity and governance

Research on resilience describes and theorizes on how socio-ecological systems function. It has also started attempting to identify factors that increase or reduce systems' resilience (EBBESSON & HEY, 2013). Based on the perspective of resilience theories and complex systems, academics have used the term governance to understand how and when water governance institutions (particularly laws, policies, regulations, structures

and systems) increase the resilience of socio-ecological systems (COSENS, 2010; CO-SENS & WILLIAMS, 2012; GREEN *et al.*, 2013). In that regard, Clarvis *et al.* (2014), for instance, explore different legal mechanisms in a range of contexts of water governance. Their work provides insights regarding the challenges and opportunities to increased resilience through legislation.

In the past decade, an increasing body of work can be observed on the needs and requirements for adaptive capacity and adaptive governance (CLARVIS *et al.*, 2014). In the water sector, practitioners and legislators deal with uncertainty on a daily basis (GA-LAZ, 2007). The unpredictability of ecosystems and their responses to human interference has been a fundamental principle in the literature on natural resources management in recent decades (HUITEMA *et al.*, 2009). Meanwhile, the behaviour of ecological systems is merely one part of the equation; the social and institutional environment is the other part (HOLLING, 1978). Progress in the interface between ecology, economy and other social sciences was substantial in recent decades, and new insights are influencing science and policy (FOLKE, 2007).

The history of use and abuse of water resources intensified dramatically throughout the last decade (BATCHELOR, 2007), affecting social and economic development, political stability and the integrity of ecosystems (UNDP, 2015). Against this backdrop, several conflicts involving multiple demands for water have emerged involving either problems of scarcity or water quality. Such conflicts obstruct the political and institutional capacity of governance systems to provide responses. In this sense, effective water governance is fundamental to minimizing such challenges. Therefore, it is considered crucial to build adaptive capacity to deal with future uncertainty and the impacts of climate change (CLARVIS & ENGLE, 2015).

In reviewing the literature, Clarvis & Engle (2015) and Green *et al.* (2013) found innumerable ways to assess adaptive capacity. Many of those works began their respective studies with the hypothesis that certain governance principles and arrangements are desirable or key to increase adaptive capacity (such as IWRM and adaptive management). The studies thus assessed the presence or absence of such arrangements or principles as indicators of adaptive capacity in different socio-ecological systems.

For example, Gupta *et al.* (2010), understanding adaptive capacity as inherent characteristics of institutions that empower social actors to respond to impacts (in the short and long term), propose criteria and dimensions to assess institutions, among others, in the water sector. In accordance with Clarvis & Engle (2015), despite advances in conceptualizing adaptive capacity, there are few empirical examples that systematically observe cases which identify how measures can be implemented in a way that builds and mobilizes the capacity for adaptation.

Adaptive approaches have been applied to a wide variety of contexts of natural resource management, notably for water. Applications by academics prioritize the attributes and qualities of flexibility and social learning (CLARK & SEMMAHASAK, 2012). These approaches are supported by other elements, such as polycentric institutional arrangements for governance operating at multiple scales (HUITEMA *et al.*, 2009; RIJKE *et al.*, 2012); ample participation, experimentation and learning within multi-level governance

structures (CHAFFIN *et al.*, 2014); and advanced management of uncertainty, which is positively associated with the realization of good governance principles. This entails the consideration of different types of uncertainty, favouring reversible and flexible options, the application of scenarios and other strategies (PAHL-WOSTL *et al.*, 2012).

Galaz (2007) highlights that initiatives in water governance must place greater emphasis on creating methodologies to test hypotheses for uncertainty in water systems and experimentation of different strategies for water resources management. In this perspective, governance is used as a tool not only to modify the system, but as a continuous process of learning-by-doing that recognizes public participation and learning together.

Nexus

Changes in the dynamics of governance have made it such that identifying the needs for development and program implementation is done through partnerships and in contexts of full understanding and appreciation for inter-sectorial connections (TORTA-JADA, 2010). Recently, a proposal to develop an approach for water resources governance and management was launched in response to a food and economic crisis (BENSON *et al.*, 2015). When not specifically related to the theme of water governance, the academy and some international organizations and agencies, such as GWP, the World Bank and, mainly, the World Economic Forum, recurred to water security as a theme. In doing so, they often used the perspective of a "water-food-energy nexus" as a support.

The main justification of these parties in promoting the water-food-energy nexus, which can also include climate, is based on the intimate relationship between the themes in this "nexus". The themes must be simultaneously analyzed to encourage win-win situations, avoid negative impacts and, ultimately, increase sustainability (KESKINEN *et al.*, 2015). Based on evidence that each of these three "resource spheres" (water, food, energy) substantively affect one other, the effects of one of these spheres could generate significant effects on another if ignored (BAZILIAN *et al.*, 2011).

Keskinen *et al.* (2015) explain that the objectives of this approach are not completely new and possess similarities with the objectives of integrated approaches, such as those of IWRM. Gupta *et al.* (2013) argue that is easier to explain the links between water and energy, agriculture, development, security and others, and their subgroups for those outside of the water sector, than to use the concept of IWRM, for example. Water security is highlighted as a key link in the network of food, energy, climate, economic growth and challenges for human security (WAUGHRAY, 2011). It recognizes the interactions occurring in all spatial scales, from the individual to the river basin, and at global levels (ZEITOUN, 2011). Also, it innovates by emphasizing on the negotiation of conflicts born out of tension in the water-food-energy nexus (BAKKER & MORINVILLE, 2013).

Proposals to address these sectorial questions, distributed by silo, are evolving from integration to collaboration, coherence and recognition of the fundamental interdependence that either limits or supports development for all. Regarding discussions of the "nexus", it is recognized that this perspective presents different dimensions. Two such dimensions are highlighted by Keskinen *et al.* (2015). The first promotes the nexus as an

approach for research and analysis, for example, to quantify the connections between "nexus sectors". The second presents the nexus rather as a tool to elaborate policies, with the potential of simplifying inter-sectorial collaboration and integrating planning and elaboration of such policies.

Stewardship

The business and corporate sector is the protagonist of another perspective that seeks to contribute to understanding water within a network of interdependent relations. In the past five years, multilateral agencies and civil society organizations with worldwide reach have started to identify the private sector not only as an actor that consumes and degrades water resources, but also as a key actor for water governance capable of promoting efficient use and conservation of the resource (EMPINOTTI & JACOBI, 2013).

Moreover, a growing number of multinational corporations are starting to recognize water as a central business concern, a vital input for production processes and a potential subject of conflict in relations with government, investors and society, in general (MASON, 2013). Since the beginning of the 2000s, some large multinational companies have started to assess and reduce water-related risks throughout their chain of production (DANIEL & SOJAMO, 2012).

In this regard, an emerging agenda for the corporate and business sector is called "*water stewardship*" and deals with responsible, ethical planning and management of water resources. Although business involvement in the water sector is not new (HEPWORTH, 2012), the fact that it is often mediated by non-governmental organizations is attributing it new contours and objectives. More recently, concerns related to water governance have also emerged. This represents a move beyond the vision of corporate social responsibility.

The difference of this proposal, as expressed by its proponents, is based on the possibility of: establishing relationships between components of the chain of production; quantifying risks for businesses, ecosystems and populations; opening space for interested stakeholders to engage; and influencing policies and decision making processes or, in other words, governance. The World Wide Fund for Nature, for example, advocates that the improvement of governance via stewardship allows non-governmental actors to play a positive role, comply with their responsibilities, and support other actors and governments to do the same (WWF, 2008).

Businesses are contributing to the emergence of global water governance by developing, implementing and promoting tools that quantify and communicate water--related risks, methodologies and management principles (DANIEL & SOJAMO, 2012). For Hepworth (2012), given the scale of influence and corporate control over the use of water, a clear and proactive engagement on the part of such actors could be very promising. Particularly so if the stewardship approach establishes a real commitment to the sustainable management of water, shared between its multiple uses through collective action in the corporate sector with other businesses, governmental and non-governmental organizations and communities. The main discussions on water governance, organized in four categories, are summarized in the chart in Figure 2.

Figure 2: Four blocks of discussions on water governance

Discussions on water governance		Main motivations	Central ideas	Main references
BLOCKS	Fair governance	- Solve problems that are not technical or technological but affect and are affected by water management, such as corruption, poverty, injustice, bringing these questions to water discussions and agenda. - Need for improvement of institutions and decision making processes – effective governance as a response or solution to "water crisis".	- Proposes and discuss the concepts of good, effective, fair governance. - Includes the discussions related to principles of water governance – transparency, equity, accountability, gender, justice, ethics, etc. - Based on certain concepts and principles, proposes governance assessments that could have multiples purposes.	Ostrom (1990); Rogers & Hall (2003); Tropp (2007); Huitema et al. (2009); Lautze et al. (2011); Gupta et al. (2010); Jacobson et al. (2013); Groenfeldt & Smith (2013); etc.
	Resilience, adaptive governance and capacity	- Seeks to understand how water governance institutions increase resilience of social-ecological systems. - Discuss and identify principles and governance arrangements that are desirable or key to enhance adaptive capacity.	- From theories, such as of the systems, complexities and uncertainties inherent in social and ecological systems are discussed. Proposes the exercise and prioritization of attributes and qualities such as flexibility, polycentricity, social learning, etc.	Holling (1978); Folke (2007); Huitema et al. (2009); Gupta et al. (2010); Ebbeson & Hey (2013); Clarvis e Engle (2015)
	Nexus	- A response to food and economic crisis - Different 'nexus' themes are so closely related that they must be analysed simultaneously to encourage advantageous situations, and to avoid negative impacts.	Proposes a new relational logic to think 'governance', that is, moves beyond the sectoral focus ("silos") to understand the interdependence between water, food, energy and climate sectors	Bazilian et al. (2011); Bakker & Morinville (2013); Benson et al. (2015); Keskinen et al. (2015)
	Stewardship	- Business and multinational corporations recognizing water as a central business concern, both for their vitality to the productive processes and as a potential point of conflict. - Leadership and business engagement with new shapes and objectives	- Sees the business and corporate sector as a potential player in the sustainability of the production chain and in improving governance - Proposes tools and methodologies for quantifying risks to businesses, ecosystems and populations, as a basis for improving water governance.	WWF (2008); Hepworth, (2012); Daniel & Sojamo (2012). Mason (2013).

Conclusion

In general, what can be obtained from the main discussions on water governance? The broad bibliographic research on the most recent movements and debates on water governance in the international sphere allows us to conclude that different methodologies and approaches are being created and discussed for several objectives. More than this, a significant body of literature is evolving in the aim of contributing to the debate on governance, and is influencing concepts and practices. There are no absolutes; such contributions come from the social and political sciences, branches of systemic thinking (systems theory and cybernetics), political ecologists and administrations.

The constant transformation of governance as a concept and its appropriation by different schools and international agencies and organizations has influenced several proposals that aim to assess, question and improve processes and institutions. The heterogeneous, sometimes confusing and chaotic, universe of water governance, makes for dynamic discussions and proposals. It provides insights for change and reform, to judge and give meaning to processes and institutions.

Independently of the proposed path, a few common premises are present in the discussions on water governance. The pursuit of fair governance is common, be it through transparency, integrity, accountability, participation or considerations for gender, poverty, socioenvironmental and ethical justice. Different stakeholders have also advocated for other essential or critical "ingredients" to improve water governance, such as collaboration, cooperation, trust, learning and experimentation. These principles appear to be the common path found by academics and international agencies and organizations. Water governance systems are dispersed in different levels and scales. The challenge is to coordinate efforts, avoid dysfunction and advance towards a system based on trust between all actors involved.

Notably, it is concluded that there is not an ideal "model" of governance. Water governance is completely dependent on the given social, cultural, environmental, economic, political and institutional context. The different approaches, methodologies and principles to apply will, thus, be more or less important depending on specific context. This means that any given water governance system must be "designed" in accordance with the obstacles to water management for which it is required. Finally, it is hoped that the discussions presented herein can serve as a starting point for those who intend to study or improve water governance systems. For Brazil, in particular, this discussion is opportune given the current analyses and questions being fielded on the subject of water resources management systems. Notably, the Water Governance Observatory, at a national level, and the National Water Agency's PROGESTÃO initiative can be pointed out.

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DISCUSSIONS ON WATER GOVERNANCE: PATTERNS AND COMMON PATHS

Abstract: Water governance is a prominent theme in the discourse of international agencies and organizations, and in the research field. Given the continuous importance of this theme in discourse, politics and science, this article presents the results of a comprehensive literature review aiming to provide an overview of discussions on water governance. With the ample body of material reviewed, the main contributions were collated and summarized in terms of their motivations and core ideas. The discussions presented herein may be a starting point for those intending to study or improve water governance systems at different levels and scales. We have mainly concluded that there is no ideal "model" of governance - water governance is totally dependent on a particular social, cultural, environmental, economic, political and institutional context.

Keywords: water governance, water management, processes, institutions.

Resumo: A governança da água é tema preferencial no discurso das agências e organizações internacionais, e na pesquisa. Dada a contínua importância da temática no discurso, na política, e na ciência, este artigo objetivou prover uma visão geral das discussões de governança das águas, a partir de algumas das principais contribuições da literatura. A ampla pesquisa bibliográfica resultou em inúmeras informações, sendo as principais contribuições organizadas, e sumarizadas em suas motivações e ideias centrais. As discussões aqui apresentadas podem ser ponto de partida para aqueles que intencionam estudar ou aperfeiçoar sistemas de governança das águas em diferentes níveis e escalas. Conclui-se, sobretudo, que não há um "modelo" ideal de governança – a governança da água é totalmente dependente de um determinado contexto social, cultural, ambiental, econômico, político e institucional.

Palavras-chave: governança da água, gestão da água, processos, instituições.

Resumen: La gobernanza del agua es el tema preferente en el discurso de las agencias y organizaciones internacionales, y de la ciencia. Teniendo en cuenta la continua importancia del tema en el discurso, la política y la ciencia, este artículo tiene como objetivo proporcionar una visión general de los debates sobre la gobernanza del agua de algunas de las principales aportaciones de la literatura. La extensa búsqueda bibliográfica dio lugar a numerosas informaciones, e las principales contribuciones organizados y resumidos en sus motivaciones e ideas centrales. Las discusiones que aquí se presentan pueden ser un

punto de partida para aquellos que tengan la intención de estudiar o mejorar los sistemas de gobernanza del agua en los diferentes niveles y escalas. Se concluye, sobre todo, que no hay un "modelo" ideal de gobernanza - una gobernanza del agua es totalmente dependiente de un determinado contexto social, cultural, ambiental, económico, político e institucional.