

The ‘Pluralism Puzzle’: Shifting from Reductionist to Pluralistic Understandings of Water Security

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Abstract

There is an increasing divide amongst water researchers and policy-makers between the reductionist approach to complex water-society policy challenges, and a more integrative approach that embraces complexity and uncertainty. This paper provides an overview of governance and water security theory with an emphasis on partnerships before discussing the divergent research streams of narrow and broad framings of water security. Understanding and bolstering the process behind pluralistic approaches to water-society challenges is important for achieving good governance for water security and moving beyond conventional, supply-side decision making in the water sector. Using case studies in the Okanagan basin, Canada, and the Jamapa-Antigua Sub basin, Mexico, we identify key aspects of the pluralism process that may be applied to other basins around the world: principles of transparency, collaboration, representation, basin-scale thinking and a focus on long term impacts. Understanding why pluralism is working in the Okanagan and Jamapa-Antigua basins may shed light on how governance can shift away from reductionist approaches to water security and edify that integrative approaches are the way of the future even if they are not always perfect.

Introduction

Integrative approaches are the current phenomenon in water governance. Traditionally, interventionist approaches have been standardized to provide good governance for water security and solve water-society challenges. However, collaborative and integrative approaches constitute elements of a new paradigm - pluralism - shifting away from reductionist rational. This new integrative model recognizes the importance of partnerships and is better adapted to solve simple and complex water-society challenges to provide good governance for water security. In all approaches, good governance must be fundamentally understood and exhibited in order to provide solutions to water-society problems. Furthermore, the need for more integrative approaches towards good governance for water security is a direct response to the

negative effects of climate change and the fast-changing water governance model of the 21st century.

Understanding and bolstering the process behind pluralistic approaches to water-society challenges is important for achieving good governance for water security and moving beyond conventional decision-making in the water sector. Using case studies in the Okanagan basin, Canada and the Jamapa-Antigua Sub basin, Mexico, we will explore the process operationality of pluralistic approaches and identify key aspects of pluralism that may be applied to large or small-scale basin projects around the world; more directly, which parts of the pluralism process are important? These case studies are very different and demonstrate that pluralism can start from the bottom-up with local actors as in Jamapa-Antigua, or can be a reconfiguration of existing institutions and government structures as exemplified in the Okanagan basin study. By understanding the differences in approach in the Okanagan basin and Jamapa-Antigua basin, as well as their similarities, it will be observed that integrative approaches to water-society challenges are the way of the future, even if they are not always perfect.

Water Security and Governance

The notion of water scarcity introduced two new concepts into the 21st century water governance dialogue: water security and integrated water resource management (IWRM). Water security can be defined as the “capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development” (United Nations Institute for Water, Environment, and Health, 2013, p. vi). IWRM is a specific approach to counter poor water governance by building on sustainability and three essential pillars: (1) economic efficiency, (2) environmental sustainability, and (3) social equity (Varaday et al., 2016). Focusing on these three pillars can improve water governance and management, and has been internationally recognized as an

approach that could solve water-society challenges. Poor governance and management has been attributed to worsening water security and the overall water crisis: “the roots of the crisis in water can be traced to poverty, inequality, and unequal power relationships, as well as flawed water management policies that exacerbate security” (UNDP, 2006, pp. v). Therefore, governance must be a fundamental element of integrative approaches to water security that seek to solve the simplest and greatest of challenges.

Simplistically, governance is about providing more opportunities for individuals to improve their livelihoods (UNDP, 2006). *The Commission on Global Governance* defines governance as:

“The sum of the many ways individuals and institutions, public and private, manage their common affairs. It is a continuing process through which conflicting or diverse interests may be accommodated and co-operative action may be taken. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that people and institutions either have agreed to or perceive to be in their best interest (Commission on Global Governance, 1995, p. 4.).

Developing integrative approaches aimed at providing good governance for water security must promote three key objectives of good governance: improving transparency among actors, equal participation between actors, and promoting equal accountability amongst all actors (Glasbergen, Biermann, & Mol, 2007; UNDP, 2006). Correspondingly, the UNDP has developed a comprehensive criterion, consisting of 10 components, for good governance: accountability, coherency, effectiveness, equity, ethical considerations, integration, participation, responsiveness, rule of law, and transparency (UNDP, 2006).

Accountability, the first component of the UNDP developed governance criterion, requires all partners remain accountable for their independent and collective interests (UNDP, 2006). The second component in the water governance criteria, coherency, aims to take into account the intricacy of water issues and urges that any action in the water sector must be

coherent, consistent, and clear (UNDP, 2006). Effectiveness, the third component, states that results should be met realizing specific needs while not straining resources (UNDP, 2006). Equity insists that all members of society regardless of colour, ethnicity, and gender, should have the opportunity to improve their livelihoods, and the ethical considerations component asserts that water governance must take into account the ethical principles of society, such as respecting traditional water rights (UNDP, 2006). Integration, the sixth component of effective water governance, seeks to affirm the need to promote holistic approaches for sustainable water development (UNDP, 2006). Participation, is similar to equity in that all citizens should have a voice throughout the entire process of sustainable water development, whether that is through direct participation or through organizations or groups representing their interests (UNDP, 2006). Responsiveness is another central component to effective water governance as institutions and processes should serve the interests of all stakeholders and respond in an appropriate manner to changing or new circumstances, demands, or unforeseen changes (UNDP, 2006). The rule of law component suggests that promoting human rights should be a fundamental priority of sustainable water development and legal frameworks should be enforced impartially (UNDP, 2006). Finally, transparency calls for information to be free, public, and readily accessible for all interested entities (UNDP, 2006).

Accountability, participation, and transparency represent fundamental overarching elements of good governance as these characteristics represent principles of democracy and respect human dignity and individual autonomy (Carothers, 2014). Following the proposed UNDP governance criteria can help achieve good governance for water security and improve our understanding of developing integrative approaches aimed at solving water-society challenges. Furthermore, partnerships as an integrative approach aim to encourage good governance and can significantly improve the way in which water-society challenges are solved (Brinkerhoff, 2007).

Partnerships and Pluralism

Partnerships are an example of an integrative approach that can help achieve good governance for water security and solve various water-society challenges. In defining partnerships, a partnership should be viewed as a “style of operation” initiated to reach collective and individual objectives that could not be accomplished without the existence of the partnership (Stewart & Gray, 2009). Partnerships are generally created to enhance partner effectiveness in accomplishing individual and shared goals, to provide collective decision-making and problem-solving, and to promote good governance (Glasbergen, Biermann, & Mol, 2007). Weak partnerships are commonly characterized by poor dialogue and other insufficiencies such as poor information sharing (Stewart & Gray, 2009). Conversely, strong partnerships are indicated by collective decision-making and problem-solving, continuous financial arrangements until the objectives are satisfied, and good governance practices (Stewart & Gray, 2009). To further supplement the characterization of strong partnerships, especially those partnerships aimed at solving water-society challenges, there are nine outcome requirements that should be reached: (1) understand that the objectives could not be met without the partnership; (2) create objectives that will significantly impact the beneficiaries of the partnership; (3) collaboration amongst all partners; (4) create innovative solutions; (5) enhance IWRM concepts and principles; (6) organize additional resources; (7) complement ongoing efforts; (8) increase the accountability between partners and the direct beneficiaries of the partnership; and (9) satisfy the objectives of the partnership (Stewart & Gray, 2009).

Although there is a formidable framework to follow when creating partnerships, there are still several challenges. The first challenge is how to address both the implementation and participation gap simultaneously and to the same degree (Glasbergen, Biermann, & Mol, 2007; Stewart & Gray, 2009). Another challenge is the lack of mechanisms to constructively assess the inaction of partners and poor performance of the partnership (Stewart & Gray, 2009). A

further challenge is knowing whether the time and effort it takes to develop a respectful and trusting partnership will be fruitful. Lastly, the vagueness of the term partnership and the differing evaluation strategies in measuring the success of partnerships is a significant challenge to the partnership model.

Despite the obstacles and limitations of the partnership model, partnerships are the fastest growing integrative approach towards good governance for water security and solving many water-society challenges. One reason for this fast-paced movement is due to the beneficial effects of collaboration. Collaboration - “a process through which parties whose different aspects of a problem can explore constructively their differences and search for solutions that go beyond their own limited vision of what is possible” (Lasker et al., 2001) – can not only directly improve good governance strategies, but can also be a catalyst towards making a meaningful contribution towards solving the most complex water-society challenges. Not only are collaborative and integrative approaches systematically improved over reductionist strategies, integrative solutions continue to be endorsed by the international community. As long as climate change continues to negatively impact water governance, management, and security, integrative approaches will be necessary to effectively promote good governance for water security and solve the greatest water-society challenges.

Approaches to Water Security: A Dividing Paradigm

Water security was initially framed to focus on specific human issues, normally related to military or food security (Cook and Bakker, 2012). The Global Water Partnership (GWP) introduced an integrative definition of water security at the Second World Forum that considered issues of water accessibility, affordability, human needs, and ecosystem health (GWP, 2000). Although conceptualizations of water security have been derived from differing perspectives, Cook and Bakker (2012) identified four major themes in relation to water security: water availability, human vulnerability to hazards, human needs (development-

related, in particular food security), and sustainability. Their review (2012) found that measuring water availability using water stress and water shortage indicators was a popular assessment tool as it categorized sufficiency for humans as the primary gauge of water security. Issues related to water hazards and vulnerability involved protection from floods and droughts, sustainable development of water resources, and safeguarding access to water services. Water security from a 'human needs' perspective covered a broad range of issues, including water access, food security and human-development related concerns such as health and sanitation (Cook & Bakker, 2012). Lastly, the sustainability element framed water security as access to enough safe water at affordable costs to have a clean, healthy and productive life, while ensuring that the natural environment was protected and enhanced (GWP, 2000)

The review by Cook and Bakker (2012) indicated that approaches to water security were diverse and evolving. Some aspects of these approaches were incommensurable, and others were symbiotic. Integrative approaches were advocated for by the authors, as they bring good governance to the forefront of water security challenges (Cook and Bakker, 2012). Additionally, integrative framings of water security, narrowly and broadly, were said to be necessary at the policy level, and in governance processes to sort out competing users and uses of water. Hence, narrow and broad framings of water security can be seen as complementary in this light rather than mutually exclusive (Cook and Bakker, 2012).

There has been little evidence of a more integrative approach to water security research or policy making since the review by Cook and Bakker in 2012 (Zeitoun et al., 2016). Since that review, framings of water security have become increasingly divergent. Generally speaking, existing water security framings may lead to broad, interdisciplinary and inclusive approaches, with security understood as reliability, adaptability and freedom from fear; water security could also be understood in terms of predictability and control, serving to re-brand outdated and problematic ideas (Zeitoun et al., 2016). This contradiction characterizes the

growing dissonance among the many framings of water security. Zeitoun et al. (2016) posit that the fault-line to consider when differentiating between these approaches to water security is how they address the complexity of water-society challenges. The authors described complexity as “the nonlinear functioning and coupling of the many political, technological and biophysical processes that weave water and society together” (p. 144) and highlighted the increased complexity resulting from the uncertainty of future water availability and demand.

Two major research streams were categorized on either side of the complexity fault line by Zeitoun et al. (2016). The first was the dominant and prevailing reductionist approach, which seeks ‘security through certainty’ and underplays political diversity in society. Policy-makers prefer this approach because of its specificity, even though this approach may be insufficient towards dealing with climate and societal changes and can reproduce inequalities. The second approach is more integrative and pluralistic, seeking to incorporate uncertainties by explicitly recognizing diversity in society and the environment. Pluralistic policy implications are diverse, inclusive and focus on marginalized people, but often encounter policy-uptake obstacles. Below is an overview of ideas from Zeitoun et al. (2016) on the increasing divide among researchers and policy makers in the realm of water-security between the conventional, reductionist approach to water-society challenges and a more integrative approach that embraces uncertainty and complexity.

The Narrow Approach to Water Security

The conventional, reductionist approach to water-society challenges is built on principles of quantifying risk, reducing complexity, and oversimplifying concepts related to water security (Zeitoun et al., 2016). Social considerations are neglected and power asymmetries that favour the wealthy over the marginalized are downplayed, resulting in uninnovative policies that are unable to deal with changing environmental conditions. The appeal of the reductionist approach is that policy recommendations are clear and specific, yet generalizable. However, several

shortcomings outweigh the benefits of a reductionist approach in policy-making: representing uncertainty through calculable risk, unreliably linking GDP to hydro-climatological causes, and overlooking diversity and politics in society.

Narrow approaches to water security often place domestic water supply challenges in a risk-framing perspective in relation to hazards and the economy (Zeitoun et al., 2016). This is attractive for decision-makers as they can use this perspective to justify large infrastructure projects such as dams and canals. Findings that are presented using a risk-framing perspective and extensive simplifications can lead policy-makers to view water security issues from a shallow perspective (rainfall or runoff variability) and perceive built-infrastructure storage as winning solutions. Adopting clear and oversimplified policy recommendations may also serve to reinforce existing investments in the water and development sectors, as actors in these sectors remain influential in policy decisions reflecting scientific ideas and perspectives.

Research in the reductionist stream facilitates increasing water supply and narrow conceptions of water-use efficiency while advocating for investments in hydraulic infrastructure and institutions (Zeitoun et al., 2016). Due to the interests of financial institutions in high expenditure infrastructure projects, the benefits of dams, canals, and storage schemes become widespread without paying attention to their downfalls. The result is a lack of consideration for future hydro-social-climatic conditions, social, ecological and economic costs, and a lack of fit to existing water distribution infrastructure (especially in rural/local areas). This supply-side logic has negatively impacted governments around the world as those governments must now deal with the over-capacity of water infrastructure designed for confined purposes. The reductionist approach is also hindered by being restrictive to water resources that are easily measured, like surface water, thus excluding aquifers and groundwater. By ignoring these water resources in the measurements, communities that depend on those sources are neglected in policy-making decisions and remain tasked with finding innovative

strategies to protect water resources without help from the government. Water security policy and projects need to consider its true beneficiaries and aim to include all relevant attributes in society, such as gender, incomes, religions, and nationalities.

The uncertainties excluded in obtaining reductionist policies are often the same uncertainties that render them ineffective in the future (Zeitoun et al., 2016). There remains space to develop a more integrative approach that encapsulates the usefulness of reductionist practices, while broadening uncertainty and increasing creativity in the methodologies used for promoting good governance in water security. Zeitoun et al. (2016) highlight three points of leverage for a more pluralistic vision of water security: (1) water analysis must match the level or state of knowledge possessed, (2) there needs to be more research into processes that impact water beyond the described ‘water box,’ such as political-economic systems and the relationships between hydrology, hydrogeology, and agronomy with climate and social science, and (3) water security analysis should explicitly address inequity in outcomes and work to integrate power asymmetries. Perhaps the most severe conclusion taken from the narrow stream of research is the false belief that poverty and water insecurity are tied to a set of social and climatic conditions that cannot be changed.

The Pluralistic Approach to Water Security

Integrative approaches to water security embrace complexity, are socially driven, context specific, and inclusive of all relevant actors in the water-society (Zeitoun et al., 2016). Pluralism incorporates water resources that are less easily controlled and uses adaptive approaches to move beyond conventional supply-side decision making. Policies resulting from an integrative approach are often novel and non-translatable to other places, which is currently both a hindrance for policy uptake and a fundamental pillar of the approach itself. Analyses and policy options framed in an integrative way accept imprecision as part of the improvement

process in water security, and intentionally move away from achieving precision at the cost of society and the environment.

Integrative framings of water security interweave social and biophysical processes, interdependencies with other resources, along with climate, food, and energy security (Zeitoun et al., 2016). Water security policy must consider these wider ‘nexus’ issues and discuss how water should be allocated and on what scale to manage it; efforts must go beyond the ‘water box’ to incorporate the influence of finance, trade boards, multinational corporations and local private-sector actors who are involved in water and sustainability (Zeitoun et al., 2016). Currently, the focus of much of the literature under the integrative stream of research limits the generalizability of policy recommendations and causes hesitation amongst donors seeking returns on investment in development projects. In a broad sense, the uncertainties of a particular complex water challenge can be approached through planned redundancies in systems, reversible infrastructure, or decision-making frameworks that explicitly incorporate diverse perspectives. Evidently, pluralistic policy recommendations may respond better than reductionist approaches to dynamic climate and social conditions and contribute to more innovative projects and ideas aimed at solving water problems while promoting good governance.

Adaptation and flexibility approaches are a large component of pluralism and serve to integrate innovation in the face of an uncertain future (Zeitoun et al., 2016). Adaptive water management can benefit water security by moving beyond measures of water use efficiency in production to focus on learning, adapting, and consumption patterns. Ultimately, the integrative approach to water security is moving away from viewing security in simple terms of sufficiency or minimizing risk, towards recognizing shared responsibilities. This pluralistic view of water security emphasizes the complexity of water-society challenges by recognizing diversity in society and the environment, focusing on the most marginalized populations, incorporating

water resources that are harder to control, and welcoming innovative and adaptive approaches to move beyond supply-side water projects (Zeitoun et al., 2016). Moreover, supply-side interventions can take place as one option among many within the pluralism perspective. In the case studies below, we explore integrative approaches to water-society challenges and highlight why these approaches may be successful in their respective contexts while extracting concepts of pluralism that can be applied more widely to governance for water security in other basins around the world.

Case Studies: Pluralism in Action

Integrative approaches can produce effective water governance by embracing diversity and bolstering fundamental governance principles. The two case studies below address water-society challenges in different socio-environmental contexts, illustrate the adaptability of pluralism to fit a wide range of scales, and show how benefits can extend beyond specific water users. As discussed above, pluralism aims to improve water security from a socio-ecological perspective, where not only water storage, delivery and supply matters, but also water dynamics and its unique characteristics (Savenije, 2002).

There are several natural processes that determine water quality, as well as numerous water-dependent variables that directly affect social development: infiltration, erosion, groundwater availability, pollution, eutrophication, and agricultural yields. From a pluralistic perspective, water issues and challenges are a result of the interaction of many systems within a biophysical area: the water basin. While it obeys a naturally drawn division of the landscape where water flows and interacts with specific conditions, a water basin also represents the profound interconnection among its elements and actors. As water is embedded in every aspect of the basin dynamics, it works as the ideal scale for water management that follows natural, rather than political boundaries (Cotler, Garrido, Bunge, & Cuevas, 2010). This stance is recognized and embraced by the two case studies we investigated.

Mexico and the Jamapa-Antigua Sub-Basin

Despite the appearance of an abundance water (Tortajada, 1998; Hernández, 2003), Mexico faces severe water issues: only about 5% of the total amount of freshwater is considered clean, and water distribution is inconsistent and inefficient across the country (Hernández, 2003). Hence, there is a need to search for approaches that go beyond narrow solutions merely focused on supply management and focus on inclusion, collectiveness and locality with basin actors putting forth solutions (Tortajada, 1998).

Water basins are important resource reservoirs across México; the Papaloapan River Basin, which covers 41% of the Veracruz State territory and receives the most rain discharge on a national level - almost 45 million m³/year (Pereyra, Pérez & Salas, 2010) - includes three sub basins, namely the Actopan, la Antigua, and Jamapa basins. An integrative water governance initiative recently emerged as a social response to the mismanagement of water and socio-environmental disruptions in the Jamapa-Antigua sub-basin. As the Jamapa-Antigua sub-basin covers 6,250km² (Cotler, Garrido, Bunge & Cuevas, 2010), the sub-basin provides water to 18 cities, multiple rural settlements, and presents highly altered functional dynamics (Pereyra, Pérez & Salas, 2010).

The Jamapa-Antigua Bioregion Coalition Initiative (COBIJA) pursued a pluralistic approach where social actors recognized a shared interest in improving water management practices to improve all beneficiaries of the sub-basin. A call to action in Jamapa-Antigua was first released by the 'Encounter for an Autonomous and Sustainable Development' (SENDAS), an organization with 20 years of experience on developing locally appropriate strategies to achieve sustainable development in the region. As multiple entities resonated with this call, the foundation of COBIJA was built with aspects at its foundation. Beginning in 2017, the initiative's local action plan consists of actors from the agricultural sector, environmental justice NGOs, gender focused NGOs, and food sovereignty alliances seeking to improve water

management and governance through collaborative strategies. These actors all share the same set of goals: to live with dignity, respect other forms of life, pursue social equity, repel oppression faced by collective groups, and achieve sustainable development through wise territory governance from a basin perspective. This highlights a “bottom-up approach” and invites society to mobilize together to improve water management, water security governance, and solve the problems that plague water-society.

To achieve their goals and move from a narrow to a holistic approach, the COBIJA follows a practice known as “Social Actors Mapping” (Fuentes, 2017). This specific process identifies people, groups, and organizations whose actions impact the basin (e.g. government, civil associations, private sector, community actors and academy). It aims to enhance participation, as well as to determine roles, capacity to act, and the strengths and weaknesses within the basin’s boundaries. In this sense, the actors’ mapping allows the initiative to identify existing partnerships in the basin, such as the Coffee Producers’ Regional Council (CORECAFECO) and the Agroecology Development Network (VIDA). COBIJA recognizes the “social basin” as a significant and intangible aspect of the water basin. It represents an essential perspective for any water management strategy and is similar to the idea of ‘problem-shed’ (Allen, 1998; Mollinga, Meinzen-Dick & Merrey, 2007). Unlike the ‘problem-shed’, the ‘social basin’ includes the political and environmental relationships that affect water-related matters (Fuentes, 2017).

After analyzing the progress reports and resolutions in problem-solving and decision-making, COBIJA’s unifying principles and guidelines (See Appendix, Table 1) that resonate with pluralism include: (1) the recognition of socio-environmental processes being deeply linked to the water dynamics of the specific basin, and the vulnerability of those dynamics to societal actions; (2) the need for water-related policies to be designed by both government and society, and the necessity of basin actors’ participation in the project action plan to achieve the

collective goals of the initiative; (3) the improvement of communication and trust-building between relevant actors and the importance of a partnership approach in water governance; and (4) the functionality of water policies must be inclusive so that all members of society benefit through the improvement of socio-environmental systems (Fuentes, 2017).

Although the COBIJA is relatively new and small, it took action against reductionist perspectives of water security in their region that were neglecting relevant actors in the social basin. To further emphasize the need for more pluralistic approaches for water security governance and solving water-society challenges, the COBIJA could link with existing committee's such as The Antigua Basin Committee, which is recognized by Mexican Law in regards to National Waters, to create a linkage between the government, water users, and other civil society organizations, and provide further legitimacy to the initiative.

Canada and the Okanagan Basin

The Okanagan sub-basin is a major tributary to the Columbia River extensive basin and covers a narrow valley that extends over 21,000 km², which is three times larger than the Jamapa-Antigua basin territory. The 200 km Okanagan River flows North to South, from British Columbia through to Washington and Oregon in the United States of America (USA), supplying water to lakes across the region (Newton and Marsh, 2013). While the amount of water perceived in the lakes gives a sense of abundance, the hydrological resources are the result of decades of accumulation (an annual precipitation of less than 300mm and an annual inflow ranging from 100-1300 million m³), with numerous actors in Okanagan acknowledging that water use should not exceed yearly water inflows in order to align to sustainable water practices (OBWB, 2014).

Although the two basins differ in region and size, there are similarities between the Okanagan sub-basin, and the Jamapa-Antigua sub-basin. Both regions are impacted by water pollution, the presence of invasive flora and fauna, and unpredictable weather patterns

(Melynychuka, Jatel & Sears, 2017). In contrast to the COBIJA initiative, the Okanagan example of a pluralistic approach towards water governance that started many decades ago. Since 1964, municipal authorities analyzed regional water quality concerns after the water-society cited concerns of pollution levels in the sub-basin. The study's results raised awareness on the need to manage water resources through inclusive processes, as pollution was a result of practices along the entire basin. By 1974, through the Municipalities Enabling and Validating Act, the Okanagan Basin Water Board (OBWB) was founded in order to address such issues (OBWB, 2016). Since then, the OBWB has served as a local managing organization that bridges three regional governments and 12 municipalities by coordinating agreements between different levels of government and other relevant actors.

According to Nowlan & Bakker (2007), the OBWB approach to water governance is characterized by decision-making with government and non-government actors across multiple interest groups and consists of broad representation and wide social inclusion. The board's main objective is to improve the quality of life in the Okanagan basin through sustainable water management (OBWB Strategic Plan, 2013). The OBWB acknowledges the importance of achieving effective partnerships among various actors (government, local authorities, stakeholders and civil society) to reach collective action through their governing principles. The OBWB have six primary governing principles (See Appendix, Table 2) that are closely aligned with other integrative approaches and good governance criteria outlined by the UNDP, which stresses accountability, participation, and transparency: (1) representation (the inclusion of diverse actors and districts in the region), (2) service delivery (improving time management skills in the demand for water security, educational programs aimed at sustaining the sub-basin, and data collection and measurement), (3) basin emphasis (projects are aimed to benefit the entire basin through the recognition of socio-environmental challenges), (4) collaboration (monthly meetings between actors for problem-solving, decision-making, and implementation

procedures), (5) transparency (all initiative processes are easily accessible to the public with open attendance to all board meetings), and (6) legacy (the accomplishment of short-term goals to fulfill long-term goals for sustainable water development and security) (OBWB (2013)).

The OBWB initiative has built up trust among society through social engagement, and has therefore, developed a highly valued reputation in the communities involved in the initiative (Melynchuka, Jatel & Sears, 2017). To operate, the OBWB receives government funding, uses taxation from the districts involved, and applies for grants for other funding purposes (OBWB, 2016). Importantly, due to the transboundary nature of the Okanagan river sub-basin, the initiative has been developed through an International Joint Commission, which works with the OBWB. Both the International Joint Commission and the OBWB maintain good governance principles, emphasizing the need for partnerships, accountability, equal participation, and transparency in problem-solving, decision-making, and implementation (IOLBC, 2018).

Discussion of Case Studies

As illustrated through the case studies, the contexts in which water governance takes place varies greatly across scales and differing political and natural conditions. As such, complexity is valued and respected in pluralism because it can strengthen water governance structures by reinforcing relationships and partnerships rather than fragmenting decision making. Pluralism represents a long term, intensive work that contributes to a base of common understanding (Melynchuka, Jatel & Sears, 2017). When properly driven, pluralism can achieve efficient partnerships like those of coffee producers and CORECAFECO, or peasant rural settlements and VIDA within the Jamapa-Antigua sub-basin (Fuentes, 2017). Those partnerships benefit several water sectors as well as fuel the project's sustainability and resilience through time. Favouring multiscale partnerships while sustainably managing water from a basin's perspective represents a virtue that (as seen in the OBWB) can adapt to uncertain conditions

and evolve into long-term and efficient institutions. On the other hand, from a narrow approach to water governance, policy makers might be tempted to search for immediate results through strategies relying on quantifiable risks and outcomes since building trust and generating mutual agreement is an energy and time consuming process, . In this sense, initiatives like COBIJA and OBWB presented a balancing force that speaks for the majority, the diversity, and environmental fragility. Nonetheless, the key principles of these case studies that make them functional (Table 1) may represent facets of pluralism that can be harnessed and applied in any context to help research and policy shift away from reductionist practices, without determining an absolute template for what pluralism should look like.

Table 1: Principles of pluralistic approach stated in both case studies and how they are expressed in each plan. These principles may be more widely applicable in the pluralism process and understanding how to move away from conventional framings of water security.

Okanagan Basin (OBWB)	Principles	Jamapa-Antigua Sub Basin (COBIJA)
One valley-One water. Everything within the basin is connected at both social and environmental levels	Basin approach	Social Basin - Socio environmental systems are one entity that involves political and environmental relationships. Whatever happens in social or environmental contexts, affects all basin actors and its ecosystem.
Clarity and accessibility of the decision-making processes allow the project to evolve. Sharing and reporting back to society is a priority.	Transparency	Reach collective agreements by clarifying what, why and how to act as a collective group. Collection and sharing of existing data facilitates action and avoids overlapping
To be achieved through discussion on water issues and collectively agree on consequent actions.	Collaboration	Awareness on the basin’s initiative allows feedback and involvement on action plan’s design process
Locally elected actors carry the voice of basin’s varied sectors.	Representation	Any action within the basin must take into account its participants and possible outcomes.

Long term strategies through adaptive water management.	Legacy	Long term actions will be possible to achieve through active and broad participation.
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Conclusion

Water security and water-society challenges continue to represent fundamental areas of water governance and will continue to garner serious attention from the international community. The best way to promote good governance for water security and solve both simple and complex water-society challenge is to shift away from traditional reductionist strategies by harnessing the potential of pluralism. One example of an integrative approach that can be used to address governance and water-society issues are partnerships. Partnerships can act as a forum for actors to develop individual and collective goals, increase the participation of vulnerable and oppressed populations, enhance the effectiveness of like-minded actors to resolve concerns in water management, governance, and sustainable development, and to promote good governance principles and strategies. In regards to the Jamapa-Antigua sub-basin and the Okanagan sub-basin projects, the success of these projects rests in their inclusive process rather than on quantitative indicators; these projects are successful because of the manifestation of good governance into pluralistic principles and can help us understand how to move away from reductionist rationale in other contexts.

Theoretically, pluralistic approaches are destined to be successful anywhere in which they are developed and implemented, however, we must resist the temptation to create a template for what a pluralistic approach should look like. Instead, we can point to the key principles of good governance such as accountability and participation as desired attributes needed to complete the pluralism puzzle. Furthermore, the principles outlined in Table 1 - transparency collaboration, representation, a basin-approach, and a focus on the legacy of the project - may be crucial considerations of pluralism that can be applied more widely to shift

perspectives of water security from narrow to broad. As long as approaches to water security are integrative and focus on the principles of good governance, helping vulnerable people and accepting complexity in society and the environment, pluralism is possible anywhere.

The value of a pluralistic and integrative approach is that every problem is unique and requires unique problem-solving, decision-making, and implementation strategies. This paper emphasizes the need for integrative approaches in solving water-society challenges without defining what exactly 'integrative' is; defining a framework for integrative approaches defeats the purpose. Instead, we advocate for principles of pluralism as outlined in Table 1 to promote good governance in water security and shed light on how research and policy making can become more pluralistic. In the darkest of times, where environmental and societal concerns are highly interrelated and can only be solved in tandem, pluralism offers humankind the best way forward despite the challenges that remain.

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Appendix

Table 1: COBIJA’s mandates and key strategies.

Mandates

<ul style="list-style-type: none"> ● Reach actors' encountering (civil society, stakeholders and authorities) ● Reach agreements on how to act as a collective social entity. ● Define social and environmental issues within the basin by participative diagnostics. ● Collect already existing information relevant for water governance and decision making. Avoid information overlapping (groups can share knowledge, statistics and results to facilitate processes). ● Collectively define projects and actions, and clarify some inquiries: who participates? what financial, human, and time resources are needed? ● Agree on regulations to promote a multilevel, integrative water management plan designed by COBIJA. ● Identify potential sponsor organizations. Create a formal structure (coalition, certification). to apply the water management plan.
<p>Key strategies</p>
<ul style="list-style-type: none"> ● Classification of social actors in either positive, negative, or neutral influence for COBIJA's project. Inclusion of stakeholders and local leaders ● Understand the different influence levels within the basin, as to coordinate partnerships with entities that also pursue sustainable water management ● Acknowledge existing social relationships and local initiatives. Coordinate joint efforts among actors, directed to improve water governance ● Involve civil society and enhance basin actors' participation on decision making. ● Raise awareness about the initiative and the Jamapa-Antigua social basin context. <p>Source: Fuentes, 2017</p>

Table 2: OBWB mandates and key strategies.

<p>Mandates</p>
<ul style="list-style-type: none"> ● Organize proposals from diverse agencies and levels to achieve good water use/management. ● Define problems, feasibility of solutions. ● Coordinate between levels of government. ● Present proposals and recommendations to stakeholders according to jurisdiction. ● Participate financially or in practice in projects related to OWB. ● Coordinate implementation of the OB study Plan (established in 1974).
<p>Key strategies</p>

- Engage with local government leaders.
- Present findings, projects, and new opportunities in water-related areas
- .Improve access to water data for community and interested agencies.
- Coordinate water planning and policy-making.
- Inform the public about Okanagan water issues and enhance social engagement.
- Identify challenges and generate solutions through the OWSC.
- Collaborate with researchers to improve water monitoring and management
- Diversify funding sources and financial strategies while reducing costs through partnerships.

Source: OBWB Governance Manual, 2016

Table 3: OBWB strategic plan 2014-19.

The OBWB long term goals

- Adequate supplies of water for all human and environmental uses.
- Provide an excellent source water quality: drinkable, swimmable, fishable.
- Ensure that local governments, first nations, water purveyors and stakeholders have up to date coordinated plans and policies to protect water quality and supply, and prepare for extreme events.
- To achieve excellent relationships, a defined role and clear communications with stakeholders and other levels of government.

Source: OBWB Strategic Plan 2014-19