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PERSPECTIVE

We must account for the results of water governance to deliver the SDGs and beyond

Dustin Garrick[1,2,3,*], **Gina Gilson**[2,3], **Rob Hope**[2,3], **Johannes Wagner**[2,3], **Graham Epstein**[1], **Elisha Ochieng Okoth**[1] and **Fridah Silas**[1]

[1] University of Waterloo, Waterloo, Canada
[2] University of Oxford, Oxford, United Kingdom
[3] NEWAVE Network, Amsterdam, The Netherlands
[*] Author to whom any correspondence should be addressed.

E-mail: dustin.garrick@uwaterloo.ca

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Abstract

The crisis of water governance is one of results. This *perspectives paper* argues that we need to move beyond calling the global water crisis a crisis of governance. Instead, we must focus more on—and account for —the results of water governance innovations that increasingly blend public, private, and community roles. Drawing on the insights from a five-year doctoral training network on water governance, we illustrate the need for better accounting and assessment of water governance. We anchor our argument and recommendations in illustrative examples of governance innovations in Sub-Saharan Africa where linking water governance with results is necessary but challenging. After illustrating these challenges, we outline recommendations for interdisciplinary water scholars in five steps: (1) defining effective water governance in terms of the results they deliver, (2) measuring the impacts of water governance innovations by linking governance mechanisms and outcomes, (3) empowering decision-makers by examining the effects and effectiveness of water governance through place-based, science-policy partnerships, (4) creating water governance data observatories that combine data and narratives to track changes, make inequalities visible, and guide tradeoffs, and (5) broadening our typologies of water governance to better capture institutional diversity and improve 'fit' between water governance and outcomes. Together these steps help to foster learning and action and build the credibility of water governance research. A new wave of water governance scholars is ready to move beyond paradigms and principles to action and outcomes. Accelerating the transition to this next generation can inform debates with evidence and narratives that empower people, communities, governments, and companies to govern water better.

1. The crisis of water governance is one of results

In 2014, the Santa Cruz Declaration on the Global Water Crisis concluded that the global water crisis is 'fundamentally one of inequality and injustice' [1]. Through grounded examples, the consortium highlighted evidence of the water crisis in the form of injustices ranging from water grabbing in the Peruvian Andes to gendered burdens of water collection as hydroelectric facilities deprived rural Nepalese villages of their historic supplies. In the decade since, progress towards addressing these fundamental challenges remains limited, and the bar has been raised by the adoption of the sustainable development goals (SDGs).

The SDGs established more ambitious targets for access to safe drinking water in a context of significant population growth in underserved and resource constrained environments. Yet, a decade after adopting SDG 6 to ensure safe and affordable drinking water, an estimated 4.4 billion people lack safely managed drinking water services [2] and progress on expanding water access for productive uses, particularly in smallholder irrigation, has proven limited and often fleeting, as illustrated by the experiences in India [3].

In this context, water governance has gained significant policy and academic interest after 'water crises' were framed as crises of governance [4]. Water governance refers to the "ways in which societies organize themselves to make decisions and take action regarding water", a definition that reflecs the growing importance of non-state actors (e.g. community and private sector) as well as the influence of decisions and actions outside of the water sector [5]. Interest in water governance has spawned the establishment of several principles of good water governance and the development of processes to improve water governance. The OECD water governance framework is well-known with a dozen principles endorsed by 170 stakeholder groups (including 44 countries) [6], grounded in a broader set of norms including 'legitimacy, transparency, accountability, human rights, rule of law and inclusiveness' [7]. Academics have critically engaged in narratives and debates concerning water governance and raised concerns regarding the potential for vested interests to control the governance agenda [8]. Considerations of social distribution and politics feature strongly in how governance can serve and favor particular interests and powerful groups. Several decades into these debates, global reporting continues to illustrate the limited progress we are making to protect ecosystems, conserve scarce resources, or provide basic drinking water to the most vulnerable.

Over the past five years (2019–24), a group of 15 PhD students and dozens of faculty and practitioners around the world developed an innovative training network (ITN) focused on water governance (https://nextwatergovernance.net/). Their work illustrates a striking lack of progress on the Santa Cruz declaration and the SDGs. Projects focused on governance challenges and innovations aimed at achieving SDG 6, such as the role of professional maintenance models in fixing failed handpumps to deliver help rural communities to secure and sustain safely managed water supplies [9].

We argue that the crisis of water governance is in part a crisis of vision and commitment to results and their durability (although several scholars have taken important steps to link water governance with micro-level and macro-level outcomes, e.g [10, 11]). To be clear, process matters for lasting impacts. We strongly support the conclusions offered by some involved in the Santa Cruz Declaration that 'transparent and legitimate forms of arbitration, representation, and deliberation' are needed with support from national and international bodies but not to the exclusion of 'popular action' [12], such as citizens' initiatives and inclusion of the informal sector. While the focus on process-related values and attributes is important, as exemplified by the OECD Water Governance principles, it is insufficient.

We argue that the 'ends' of water governance need more accounting and accountability. Existing frameworks should be extended to examine the linkages between processes and outcomes. Who gets to decide which outcomes matter offers a link between processes and outcomes (as we outline further in the section on the ways forward, see below). However, we can untangle this knot by recognizing that some outcomes are not up for debate, including the need to ensure safe access to drinking water and broaden access for productive and subsistence irrigation uses, all while ensuring that rivers and aquifers have enough water to sustain themselves.

We provide two worked examples to illustrate the need to better account for the results of governance innovations that blend public, private, and community roles. The grounded examples highlight the complexity of water governance, yet they also illustrate fledgling efforts to track outcomes across multiple dimensions and assess the impacts of governance reforms. While individual examples are limited in their generalizability, they make clearer the type of granularity needed to link governance with results that matter locally and globally. After these examples, we turn to ways forward by outlining steps that governance researchers can take to assess outcomes in their research.

2. Rapid governance innovations demand growing accountability

2.1. Rural water supply: from access to service delivery

Governing rural drinking water in Africa has been notoriously challenging. It has now been over thirty years since the classic book *Watering White Elephants in Africa* [13] illustrated how donor 'means' rarely deliver user 'ends' in rural Africa. Experts have converged on governance models that rely on community-based management since the 1980s. While responsibility for construction of new infrastructure lies with governments and donors, operation and maintenance (O&M) are left to rural communities. Available empirical data illustrate that broken rural waterpoints often are unrepaired for weeks or months, and are sometimes completely abandoned until the next donor project emerges [14]. The objective has shifted from increasing drinking water 'access', as under the Millennium Development Goals (2000–15), to guaranteeing safe drinking water 'services' that deliver adequate water quality, reliability, affordability, and proximity as defined in the SDGs (2015–30). Services require specialized capacity and skills which are often unavailable in rural communities.

The limited success of the community-based management model has led to the emergence of professional service delivery to guarantee service outcomes [14]. Results-based contracts now reward service

providers against service outcomes. The approach is not new but requires assessments of governance that account for service outcomes and not just inputs of pipes, pumps, and concrete. It illustrates a shift from relying purely on informal community management to include professional operators working with government and communities. Financial sustainability is a key challenge as global data suggest almost all rural drinking water services require a subsidy [15], which costs approximately USD1 per person per year in Kenya [16]. In parts of Kenya, this rural subsidy is being met through results-based contracts with private sector funding. The sustainability of such governance innovations relies in part on the capacity to monitor impacts, allowing opportunities for reducing costs and demonstrating that the subsidies are delivering impacts for governments and corporate social responsibility programs.

In Mali, a professional service provider introduced a results-based contract for 1500 rural handpumps in 2017 using new metering and mobile payment technologies. With national and local government approval, a 15 year contract established the terms to guarantee a reliable supply of safe drinking water for users against payment of a regulated tariff. Service results have been positive. However, user water demand at handpumps has been lower and more variable than predicted, threatening the long-term revenue model. In response, the service provider secured additional funds to provide some communities with a higher service level, with solar kiosks providing water on-demand at public taps [15]. Revenue has increased at kiosks, particularly during dry periods, though the financial viability of the model depends on a subsidy. Emerging lessons illustrate how data has provided transparent information on revenue and water user behaviors to gauge the effectiveness of rural water governance in challenging contexts like Mali. Without such granular empirical data and the best-available evidence about outcomes, decision-makers rely on assumptions shaped by informed guesses or ideology.

2.2. Informal water vending: from the periphery to public-private partnerships

In the 50 years since the classic book, *Drawers of Water,* gave visibility to the role of water vendors in delivering drinking water in East Africa [17], the integration of the informal sector into water service delivery has proceeded in fits and starts. For example, in 1991, Cairncross and Kinnear [18] noted that small, private water providers can play an essential role in meeting safe water needs during transitions to piped water services— transitions that remain elusive in many settings. In the context of Cochabamba, site of the Bolivian water wars in 2000, Wutich and colleagues [19] asked (in 2016) whether water vendors can contribute to the human right to water, showing that when organized in associations and accountable to their communities, vendors can deliver water justice by distributing water to underserved populations. Reliance on water vendors comes with risks, however, in terms of affordability, water quality, and lock-in. Innovations in co-production arrangements have linked vendors and utilities through public-private partnerships that rely on recognition, dialogue, contracting, and regulations to expand access to safely managed water services [20, 21]. Schwartz *et al* [22] highlight the risk of lowering service levels to 'suit the poor' and locking-in sub-standard services by reducing the pressure for public providers to deliver. In this context, the reliance on vendors and their recognition as a legitimate part of water service delivery has come with the need for accountability and assessment of the impacts on coverage, water quality, and affordability [23, 24].

The city of Kisumu in Western Kenya has been an early adopter of a delegated management model that has integrated informal water provision through local public-private partnerships involving the water utility, Kisumu Water and Sanitation Company Limited, and a wide range of vendors. Nearly twenty years later, kiosks managed by locally accountable 'master operators' have provided water in informal settlements. An earlier evaluation concluded that coverage and reliability were still considered low in the two informal settlements studied but higher than the control site lacking such delegated services [25]. Over the longer term, the delegated management model helped the utility to increase coverage from 31% in 2008 to 89% in 2019 [26] with the annual report published in 2022 [27] indicating 93% coverage by public water systems that now include kiosks. The utility also highlights new forms of partnership with mobile vendors, working with water tankers on a temporary basis. Despite these strides, third party evaluations recommend improvements in accountability to consumers, water quality testing, and point-of-use treatment to address affordability and public health risks [26]. It is also important to consider how informal vendors have become accountable to their consumers and the utility, illustrating the importance of delivering results to foster trust.

3. Ways forward

Many studies of water governance conclude with a warning about panaceas, cautioning against a reliance on one-size-fits-all policy prescriptions and governance arrangements. For instance, the examples above highlight that importance of financing and accountability mechanisms, but two cases cannot lead to universal principles for 'good governance'. Our argument is far more modest, namely that the results of such financing innovations need to be assessed concretely (in terms of whether they deliver safe drinking water

services) to gauge whether they are working and for whom. Reductionist thinking and universalizing tendencies in water governance research have created a stubborn divide between research and practice where we cannot answer basic questions about what works where, why, for whom, and on which terms.

An epistemological schism now exists, where the concept (and measurement) of water governance has become contested [28]. Some call for 'water governance 2.0' where proponents claim water governance must have 'predictive value,' 'diagnose the incentive structure of the problem,' and deliver 'clear implications for policy' [29]. Another camp notes that focusing on predictive value, material outcomes, and narrow views about social accountability cannot be done without confronting the deep-seated power relations that shape 'whose rules define decision-making' [7].

We argue that this schism represents a false, unnecessary, and potentially harmful divide, and call for a greater priority on finding common ground by focusing on results. The research across the NEWAVE doctoral training network urges reflexivity and dialogue across diverse ways of knowing and ways of working [30]. In this spirit, we offer potential ways forward with a focus on a set of key issues where diverse groups of scholars already overlap on shared priorities. Specifically, we focus on five key steps that start with defining what counts as effective water governance in terms of results and moves progressively to monitoring impacts, forming partnerships that drive data observatories, and uncovering new typologies and tools. Together these steps contribute to a results-focused agenda for studying and strengthening water governance.

1. Defining effective water governance in terms of delivering and sustaining results. We urge a problem-based approach where scholars assess the efficacy of governance innovations that aim to deliver and sustain results (in terms of safe drinking water services and other aspects of the SDGs) [31]. Indicator frameworks that include water governance are typically structured around assessments of 'effectiveness,' and yet often fail to connect explicitly to the outcomes of concern for governments and communities, such as progress on SDG 6.1 and related policy goals. What counts as success is a function of who gets to decide the goals of governance and which distributional issues and inequalities to prioritize. These choices are deeply political and involve trade-offs among often competing goals, such as affordability and reliability. The recommendation here is therefore humble, namely to examine how and how well water governance contributes to outcomes that are already broadly accepted as a priority, such as delivering safe drinking water (e.g. assessing how household water sharing impacts water insecurity [32]). Attribution of results to governance processes and mechanisms is also fraught, however, leading to an overreliance on indicators that allow comparability but lack granularity to guide governments and communities. Practical steps include focusing on the mechanisms that link water governance with a core set of outcomes, including access and affordability, as illustrated in the examples above where studies increasingly focus on the relationship between governance innovations and service delivery by small and mixed water systems.

2. Measuring the results of water governance. The policy science literature and related fields have crafted careful study designs for examining the effects and effectiveness of different governance arrangements on inputs, outputs, and outcomes [33]. Water governance scholars from a wide variety of disciplines can learn from and contribute to study teams focused on impact evaluation and other methods for assessing performance to link governance reforms with outcomes and compare them with counterfactuals and alternatives [34]. While experimental methods and randomized control trials generally offer the gold standard for causal inference, they are not cheap and pose complex ethical dilemmas. The perfect should not be the enemy of the good. Well-designed statistical matching or structural equation models can assess impacts, while process tracing, analytical narratives, and well-crafted case studies can offer suggestive insights on the results of governance innovations, including indicators chosen by stakeholders and study participants [35]. Proxy data may also simplify this task in contexts with limited resources, such as financial records, annual reports, historical maps, and large-scale surveys that can be used to trace the changes in results related to governance reforms.

3. Empowering decision-makers by tailoring governance research for science-policy partnerships. The push to uncover governance principles often relies on indicators far removed from the results that matter to decision-makers. Research on the results of water governance has the potential to empower those involved in water governance processes by accounting for water values and informing contentious trade-offs [36], but doing so requires humility and compromises that can limit comparability and generalization. For the research to help governments and communities assess what works locally, ensuring face validity is a top priority, i.e. whether the research design makes sense in terms of the study aims. Doing so can be cumbersome and slow, involving pilots, trust-building, and processes of co-production that can identify how to measure what matters. Piggybacking on existing processes and partnerships can exploit synergies and lessen the fatigue involved for study participants. Research partners should look for proxies and practical strategies that leverage existing surveys and take advantage of low-cost rapid appraisals. Some of the

covid-era innovations hold promise, including the 'broad-brush surveys' used to create community profiles for urban communities to understand how social networks and social organization affected implementation and uptake of water supply and sanitation interventions in terms of facility conditions and accessibility [37].

4. Creating water governance observatories. The above steps are not easy and depend on (often costly) empirical insights. A networked approach to research that allows for observatories of common factors and relationships across diverse contexts can help address the questions above and foster greater cross-case learning. Research coordination networks such as the Household Water Insecurity Experiences network [38] illustrate the potential for shared frameworks, indicators, and partnerships to generate comparable data about governance innovations while also helping partners and practitioners on the ground. The REACH program on water security [39] has developed an 'observatory model … [to focus] collective attention and activity on a long-term, interdisciplinary and instrumented field site, which can be expanded, adapted or closed as results dictate.' Such approaches complement, rather than replace, existing indicators and monitoring protocols related to water governance, such as those for SDG 6.5.1, and its focus on integrated water management. While it is desirable to support comparisons and consistency across cases, we recommend water governance data observatories that 1) examine in detail how water governance works and evolves over time, 2) account for scale to assess inequalities that would be missed through singular focus on households, communities and regional impacts, and, finally, 3), generate repeated observations at locations and frequencies needed to track changes over time (e.g. frequently enough to assess seasonal climate variability, infrastructure stoppages, or other factors that may disrupt water service delivery).

5. Embracing the diversity of water governance. Moving beyond universal principles does not mean abandoning the search for patterns and pathways [40]. The steps outlined above can reveal more varieties of water governance including 'messy' approaches that shift the focus from panaceas to institutional diversity and the fit between governance, culture, and context [41]. Entrenched binaries tend to separate informality versus formality, markets versus states, public versus private, and so on. Typologies of water governance can focus more on the coordination mechanisms to better understand configurations and combinations of approaches, like the co-production models noted in Kisumu, or the performance-based contracts in Mali. The resulting typologies of water governance can reflect and recognize the importance of the informal sector and complex networks rather than pursue formal solutions or extreme positions in terms of public versus private control [21].

6. Toward a shared agenda. With five years remaining to meet the 2030 SDG goals, and billions still lacking safely managed drinking water services, understanding the results of water governance innovations is an urgent challenge. To achieve this, however, quick wins are needed to build momentum, along with low(er)-cost ways of generating and sharing data about water governance. A core set of questions, indicators, and relationships can help (e.g. which governance mechanisms contribute to safe and affordable water supplies, and whether such advances are sustainable and reliable). In parallel, we need deep-dive, repeated case studies based on locally-driven partnerships to help uncover new narratives and grounded lessons relevant for diverse contexts facing similar challenges (even when this involves learning from differences, and from failures). A global network of place-based research also offers the foundation for the governance observatories noted above.

The UN Water Action Agenda and Global Commission on the Economics of Water are striving to build new paradigms for water that reframe the issues, highlighting water, and the hydrological cycle in particular, as a global common good [42]. This is easier said than done. As momentum and resources are directed to these and other new ideas, it is imperative to combine bold agendas with a rigorous, evidence-based focus on what is happening on the ground and the consequences, both intended and unintended, of new paradigms and practices. A new wave of water governance scholars is ready to move from paradigms and principles to action and outcomes. Accelerating the transition to this next generation can ensure we can inform debates with evidence and narratives that empower people, communities, governments, and companies to govern water better.

Data availability statement

No new data were created or analysed in this study.

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ORCID iDs

Dustin Garrick https://orcid.org/0000-0001-6504-6550
Gina Gilson https://orcid.org/0000-0001-7162-1857
Rob Hope https://orcid.org/0000-0001-9971-9397
Johannes Wagner https://orcid.org/0000-0002-6619-4915
Graham Epstein https://orcid.org/0000-0003-3431-8511
Elisha Ochieng Okoth https://orcid.org/0009-0005-3274-1705
Fridah Silas https://orcid.org/0009-0006-9178-9001

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